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Better Cardiac Care measures for Aboriginal and Torres Strait Islander people

Fourth national report

2018–19

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Better Cardiac Care measures for Aboriginal and Torres Strait Islander people

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Australian Institute of Health and Welfare
Canberra

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Summary

The Better Cardiac Care for Aboriginal and Torres Strait Islander People project is an initiative of the Australian Health Ministers' Advisory Council. It aims to reduce deaths and ill health from cardiac conditions among Indigenous Australians.

Five priority areas consisting of 21 measures were developed to monitor the progress of the project. In this fourth national report, data are reported for 14 measures. Thirteen measures reported in the earlier 3 reports are updated and results are also included for one new measure (1.2). Two previously reported measures (1.3 and 5.4) could not be reported due to issues with data availability (1.3) and data quality (5.4). Data for the remaining 5 measures not yet reported are currently under development and are expected to be included in future reports.

Key findings

Some progress has been made toward better cardiac care for Indigenous Australians. The level of access for cardiac-related health services has improved. The proportion of Indigenous Australians who received: Medicare-funded health assessments, cardiac-related diagnostic services under Medicare arrangements and the recommended intervention following hospitalisation for a severe heart attack has been increasing over time. The mortality rate from cardiac conditions is falling among the Indigenous population.

But there are still challenges in some areas: Indigenous Australians with suspected or confirmed cardiac disease are less likely to be reviewed by a specialist compared with non-Indigenous Australians; Indigenous Australians are less likely than non-Indigenous Australians to receive the recommended intervention following hospitalisation for a severe heart attack, and the incidence and recurrent rates of acute rheumatic fever among Indigenous Australians is much higher than among non-Indigenous Australians. In addition, while the mortality rate from cardiovascular disease is falling, it is still much higher among Indigenous Australians than non-Indigenous Australians.

Better Cardiac Care Key Findings

Priority area 1: Early cardiovascular risk assessment and management



Indigenous Australians who received a Medicare Benefits Schedule (MBS) health assessment

33% in 2017–18



3% in 2004–05

Priority area 2: Timely diagnosis of heart disease and heart failure



Indigenous Australians who made an MBS claim for cardiac-related diagnostic items

11% in 2017–18



7% in 2004–05

But in 2017–18 Indigenous Australians with suspected or confirmed cardiac disease were less likely to be reviewed by a specialist than non-Indigenous Australians (**54%** versus **68%**, respectively)

Priority area 3: Guideline-based therapy for acute coronary syndrome



Indigenous Australians hospitalised for severe heart attack who received percutaneous coronary intervention (PCI)

73% in 2016–17



26% in 2004–05

But in 2016–17 Indigenous Australians were still less likely than non-Indigenous Australians to receive PCI (**73%** versus **81%**, respectively)

Priority area 4: Optimisation of health status and provision of ongoing preventive care



MBS claims for a follow-up service within 12 months after a cardiovascular therapeutic procedure in 2016–17

68% for Indigenous Australians versus **54%** for non-Indigenous Australians aged 65+

Priority area 5: Diagnosis, notification and follow-up of rheumatic heart disease



Incidence rate of acute rheumatic fever in 2017

111 per 100,000 population for Indigenous Australians versus

0.5 per 100,000 population for non-Indigenous Australians

Summary measures: Hospitalisation and mortality



Mortality rate due to cardiac conditions for Indigenous Australians

305 per 100,000 population in 1998



156 per 100,000 population in 2017

But in 2017, Indigenous mortality rate was **1.5 times** the rate of non-Indigenous Australians

Note: All rates shown are age-standardised, except for rates shown in Priority areas 4 and 5.

Table S1: Summary of results

No.	Measures	Key findings	Change over time ^(a)
1	1.1 Annual health assessments, 2017–18	31% (age-standardised rate of 33%) of Indigenous Australians received an MBS health assessment.	↑
2	1.2 Cardiovascular disease risk assessment, June 2018	30% of Indigenous regular clients of Indigenous primary health care aged 35–74 had a CVD risk assessment result that classified them as being at high risk.	↓
3	2.1 Cardiac-related diagnosis, 2017–18	89,201 MBS claims for cardiac-related diagnostic items were made for Indigenous patients (a rate of 12% - age-standardised rate of 11%).	↑
4	2.3 Suspected or confirmed cardiac disease case reviewed by a specialist, 2017–18	An estimated 100,166 Indigenous Australians had suspected/confirmed cases of cardiac disease, of which 61% (age-standardised rate of 54%) were reviewed by a specialist.	n.a
5	3.1 STEMI events treated by PCI, 2014–2017	There were 1,068 hospitalised events for STEMI among Indigenous Australians, with 65% of those treated by PCI.	↑
6	3.3 ACS events that included diagnostic angiography or definitive revascularisation, 2014–2017	5,751 hospitalised events for ACS among people aged 18 and over were for Indigenous Australians (5% of all ACS events), of which 53% included at least 1 diagnostic angiography or definitive revascularisation procedure.	↑
7	3.5 AMI in-hospital mortality rates, 2014–2017	4% of hospitalisations for AMI among Indigenous Australians aged 35 and over ended with death (137 deaths).	↓
8	4.2 Follow-up after receiving a cardiovascular therapeutic procedure in 2016–17	An estimated 1,081 Indigenous Australians made an MBS claim for cardiovascular therapeutic procedure, of which 66% received a follow-up service within 12 months.	n.a
9	4.3 Specialist physician review after a cardiovascular therapeutic procedure in 2016–17	An estimated 1,081 Indigenous Australians made an MBS claim for cardiovascular therapeutic procedure, of which 83% were reviewed by a specialist physician within 12 months.	n.a
10	5.1.1 Incidence of ARF, 2017	484 episodes of ARF were reported for Indigenous Australians (a rate of 111 per 100,000 population).	↑
	5.1.2 New registrations of RHD, 2017	224 episodes of new RHD diagnoses were reported for Indigenous Australians (a rate of 51 per 100,000 population).	n.a
11	5.2 Recurrent ARF, 2016–2017	The proportion of recurrent ARF episodes was 26% for Indigenous Australians.	↑
12	5.3 Treatment with benzathine penicillin G doses, 2017	2,630 Indigenous Australians were prescribed BPG every 28 days, of whom, in the previous 12 months, 28% received less than 50% of required doses and 15% completed the required doses.	n.a
13	6.1 Hospitalisations for cardiac conditions, 2014–2017	There were 32,088 Indigenous hospitalisations for cardiac conditions (a rate of 14.5 per 1,000 population).	↑
14	6.2.1 Deaths from cardiac conditions, 2015–2017	1,614 Indigenous Australians died from cardiac conditions (a rate of 82 per 100,000 population).	↓
	6.2.2 In-hospital deaths for cardiac conditions, 2014–15 to 2016–17	710 Indigenous Australians who were admitted to hospital for cardiac conditions died in hospital (a rate of 32 per 100,000 population).	↓

ACS = acute coronary syndrome; ARF = acute rheumatic fever; AMI = acute myocardial infarction; BPG = benzathine penicillin G; CVD = cardiovascular disease; MBS = Medicare Benefits Schedule; PCI = percutaneous coronary intervention; RHD = rheumatic heart disease; STEMI = ST-segment-elevation myocardial infarction; n.a=no trend data available

(a) Change over time data refer to the following years: 2004–05 to 2017–18 for measures 1.1 and 2.1; June 2017 to June 2018 for measure 1.2; 2004–05 to 2016–17 for measures 3.1, 3.3 and 6.1; 2005–08 to 2014–17 for measures 3.5 and 6.2.2; 2013 to 2017 for measures 5.1.1; 2010 to 2017 for measure 5.2; and 1998 to 2017 for measure 6.2.1.

Note: All rates in this table are crude, unless otherwise indicated. Comparable results for non-Indigenous Australians are not presented in this table and can be found in Appendix C.

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1 Introduction

Heart-related conditions, such as coronary heart disease, heart failure, and rheumatic heart disease (RHD), contribute substantially to poor health and reduced life expectancy among Aboriginal and Torres Strait Islander people.

Cardiac conditions are more common among Indigenous than non-Indigenous Australians; there are many reasons for this, including higher rates of risk factors for cardiac conditions (such as smoking, low levels of physical activity, overweight or obesity, diabetes, and high blood pressure) and poorer access to health services (AIHW 2015b, 2015c; Clark et al. 2012; Lopez et al. 2014).

Better Cardiac Care project

The Better Cardiac Care for Aboriginal and Torres Strait Islander People project is an initiative that was developed at the Better Cardiac Care for Aboriginal and Torres Strait Islander People Forum, held in March 2014 (BCCF 2014).

Representatives from various Indigenous and other organisations, as well as from Australian Government and jurisdictional health departments attended the forum.

The project aims to reduce mortality and morbidity from cardiac conditions among Indigenous Australians by increasing access to services, better managing risk factors and treatment, and improving coordination of care.

The forum established 5 priority areas of interventions that health services should undertake to improve cardiac care for Indigenous Australians that:

- are aligned with national and international best-practice guidelines for cardiac care and chronic disease
- were informed by the Essential Service Standards for Equitable National Cardiovascular Care
- focus on providing sustainable models of care built around partnerships between all health service providers.

The 5 priority areas are:

1. Primary preventive care—early cardiovascular risk assessment and management
2. Clinical suspicion of disease—timely diagnosis of heart disease and heart failure
3. Acute episode—guideline-based therapy for acute coronary syndrome
4. Ongoing care—optimisation of health status and provision of ongoing preventive care
5. Rheumatic heart disease—strengthening the diagnosis, notification and follow-up of RHD.

Reporting on the Better Cardiac Care measures

Since 2015, the Australian Institute of Health and Welfare (AIHW) has published 3 annual reports on the 21 Better Cardiac Care measures agreed at the BCC forum (BCCF 2014) to track the implementation and monitoring of the priority areas and associated actions (AIHW 2015a, 2016, 2018a). Table 1.1 provides a summary of the data available for these 21 measures. The 2 measures that are fully reported are shaded in green. Shaded in blue are the 14 measures that could be only partially reported either because they have been modified to suit the data available or use proxy measures to enable reporting, or because data could not be reported nationally. The 5 measures that have not yet been reported are shaded in orange.

Based on data availability, the previous 3 AIHW publications reported on 14 measures. This report—the fourth in the series—provides updated results for 13 previously reported measures, and results for 1 new measure (1.2). Two previously reported measures (1.3 and 5.4) could not be reported. Measure 1.3 could not be reported as there are no new data available to update. Measure 5.4 could not be reported due to issues with data quality on echocardiograms performed on RHD cases (details provided in Priority area 5). Data for the remaining 5 measures are under development and are expected to be reported in future reports.

Where possible, information is presented for each measure, including comparisons:

- between Indigenous and non-Indigenous Australians
- over time
- by age and sex
- by state and territory
- by remoteness area.

Appendix A outlines specifications for the data sources used, Appendix B provides technical specifications for the reported measures, including information on relevant classification codes (tables B1–B4) and Appendix C provides summary data about the numerator, denominator and rates for each of the measures presented in Chapter 2.

Supplementary tables corresponding to each figure in this report are provided as an attachment, and are available on the AIHW website at www.aihw.gov.au.

Data development plan

In parallel with the development of this report, the Department of Health funded a data development plan to progress developments of measures yet to be fully reported. The plan was drawn up after evaluating all available data sources and consulting the data custodians of a wide range of data sources. It identifies the issues in existing measures and suggests ideas and methods to deal with data gaps to enable full reporting of all measures. As well, a workshop was organised in mid-August 2019 to seek advice from internal and external expert reviewers. It is expected that the fifth national report will incorporate major revisions based on discussions held at that workshop.

Table 1.1: Better Cardiac Care measures and data sources

Measure	Data source	Data availability
Priority area 1: Early cardiovascular risk assessment and management		
1.1 Number and proportion of people who received an MBS health assessment in the previous 12 months	MBS	Available annually
1.2 Number and rate of people aged 20 or over without known cardiac disease with cardiovascular risk assessment and stratification in the previous 2 years	nKPI	Partially available annually
1.3 Proportion of people with risk factors for cardiac disease with evidence of primary care practitioner follow-up	AATSIHS	Partially reported previously/no new data for update
Priority area 2: Timely diagnosis of heart disease and heart failure		
2.1 Number and proportion of people who claimed relevant MBS diagnostic items in the previous 12 months	MBS	Available annually
2.2 Number and proportion of people who received diagnostic services within 30 days of referral		Not available
2.3 Number and proportion of people with suspected/confirmed cardiac disease reviewed by a cardiologist in the previous 12 months	MBS	Partially available annually
Priority area 3: Guideline-based therapy for acute coronary syndrome		
3.1 Number and proportion of people with ST-segment-elevation myocardial infarction: (i) treated by primary percutaneous coronary intervention; (ii) treated with fibrinolysis	NHMD	Partially available annually
3.2 Proportion of people with ST-segment-elevation myocardial infarction who were not provided any reperfusion therapy		Not available
3.3 Proportion of people with acute coronary syndrome who received a diagnostic angiography or definitive revascularisation procedure within the index admission/within 30 days	NHMD	Partially available annually
3.4 Proportion of people diagnosed with acute coronary syndrome discharged from hospital on appropriate secondary prevention medicines		Not available
3.5 In-hospital, 30-day and 12-month mortality rates for people admitted to hospital with a primary diagnosis of acute myocardial infarction	NHMD	Partially available annually
Priority area 4: Optimisation of health status and provision of ongoing preventive care		
4.1 Number and proportion of patients reviewed by a primary health-care professional within 1 week of discharge from hospital		Not available
4.2 Number and proportion of patients with cardiac disease who received follow-up Medicare items within 3 months of hospital discharge	MBS	Partially available annually
4.3 Number and proportion of patients with cardiac disease reviewed by a specialist physician within 3 or 12 months of hospital discharge	MBS	Partially available annually
4.4 Number and proportion of patients with coronary heart disease discharged on secondary prevention medications and remaining on it at 3, 6, and 12 months		Not available
Priority area 5: Strengthen the diagnosis, notification and follow-up of rheumatic heart disease		
5.1 Annual incidence of all acute rheumatic fever episodes	National RHD data collection	Partially available annually
5.2 Proportion of all acute rheumatic fever episodes that were recurrent	National RHD data collection	Partially available annually

(continued)

Table 1.1 (continued): Better Cardiac Care measures and data sources

Measure	Data source	Data availability
Priority area 5: Strengthen the diagnosis, notification and follow-up of rheumatic heart disease (continued)		
5.3 Median proportion of scheduled benzathine penicillin G doses given to patients with confirmed acute rheumatic fever or rheumatic heart disease in the previous 12 months	National RHD data collection	Partially available annually
5.4 Proportion of people with moderate or severe rheumatic heart disease who received an echocardiogram in the previous 12 months	National RHD data collection	Partially reported previously/no new data for update
Summary measures: Hospitalisation and mortality		
6.1 Age-standardised rates of hospitalisation for a cardiac condition	NHMD	Partially available annually
6.2 Age-standardised rates of cardiac mortality	NMD/NHMD	Partially available annually

Green shading indicates that data are available to report on the full measure.
 Blue shading indicates that data are available to report on part of the measure.
 Orange shading indicates that data are not yet available for reporting on the measure.

AATSIHS = Australian Aboriginal and Torres Strait Islander Health Survey; MBS = Medicare Benefits Schedule; NHMD = National Hospital Morbidity Database; nKPI = National Key Performance Indicators; NMD = National Mortality Database; RHD = rheumatic heart disease.

Source: BCCF 2014.

2 Results

Priority area 1: Early cardiovascular risk assessment and management

Primary prevention in the form of early and consistent risk factor identification and management will improve long-term outcomes for Aboriginal and Torres Strait Islander people, reduce the population burden of chronic cardiac disease and improve the appropriate delivery of care by the health-care system (BCCF 2014).

Priority area 1 measures are based on the premise that all Indigenous Australians with no known cardiac disease should receive: an annual cardiovascular risk assessment; appropriate management and follow-up for identified cardiac disease risk factors; lifestyle modification advice appropriate to their cardiovascular risk level, as per current guidelines (NACCHO & RACGP 2012).

The 3 measures recommended for this priority area are:

- measure 1.1 on health assessments
- measure 1.2 on cardiovascular risk assessment
- measure 1.3 on evidence of primary care practitioner follow-up (data not available to report).

Updated Medical Benefits Schedule (MBS) data are available for measure 1.1 on health assessments, and new data are available for measure 1.2 from the AIHW national Key Performance Indicators (nKPIs) for Aboriginal and Torres Strait Islander primary health care data collection. Updated data for measure 1.3 are not available to report.

Measure 1.1: Annual health assessments

This measure reports on the number and proportion of Indigenous Australians who had a Medicare-funded health assessment in the previous 12 months. (Table B2 contains the list of relevant MBS item numbers included in the measure — which includes the indigenous-specific MBS item 715 and other MBS general health assessment items available for both Indigenous and non-Indigenous Australians.)

Why is it important?

Health assessments aim to increase preventive health opportunities, detect chronic disease risk factors, manage existing chronic disease and reduce inequities in access to primary care for Indigenous Australians. Early detection and management of risk factors for cardiac disease (such as smoking, physical inactivity and high blood pressure) can reduce the incidence of cardiac disease and lessen its severity.

All Indigenous Australians are eligible for an annual Indigenous-specific health assessment, which is listed as item 715 on the MBS. This comprehensive health assessment, though not a specific cardiovascular risk assessment, covers a wide variety of risk factors related to cardiac disease and other chronic diseases. It assesses such aspects as medical history, nutrition, physical activity, smoking and alcohol intake, living conditions and body mass index. Specified target groups may also be eligible for other types of MBS health assessments (Department of Health 2014), referred to as 'general' health assessments in this report. Indigenous Australians who received a general health assessment are also included in this measure. However, the main type of MBS health assessment being measured is MBS 715. Equivalent health checks that occur in private consultations are not included in this measure.

Results

Overall

- In 2017–18, nearly one-third of Indigenous Australians (a crude rate of 31%, or an estimated 237,500 people) received a health assessment — 97% of which were MBS item 715.

Time trend

- Between 2004–05 and 2017–18, the age-standardised proportion of Indigenous Australians who had a health assessment rose from 4% to 36% for females, and from 3% to 31% for males (Figure 1.1a).
- From 2016–17 to 2017–18, the overall age-standardised proportion of those who had a health assessment rose by 2 percentage points (from 31% to 33%).
- A marked increase in those who had a health assessment occurred from 2010–11, coinciding with the introduction of the Australian Government's Indigenous Chronic Disease Package.

Sex and age

In 2017–18:

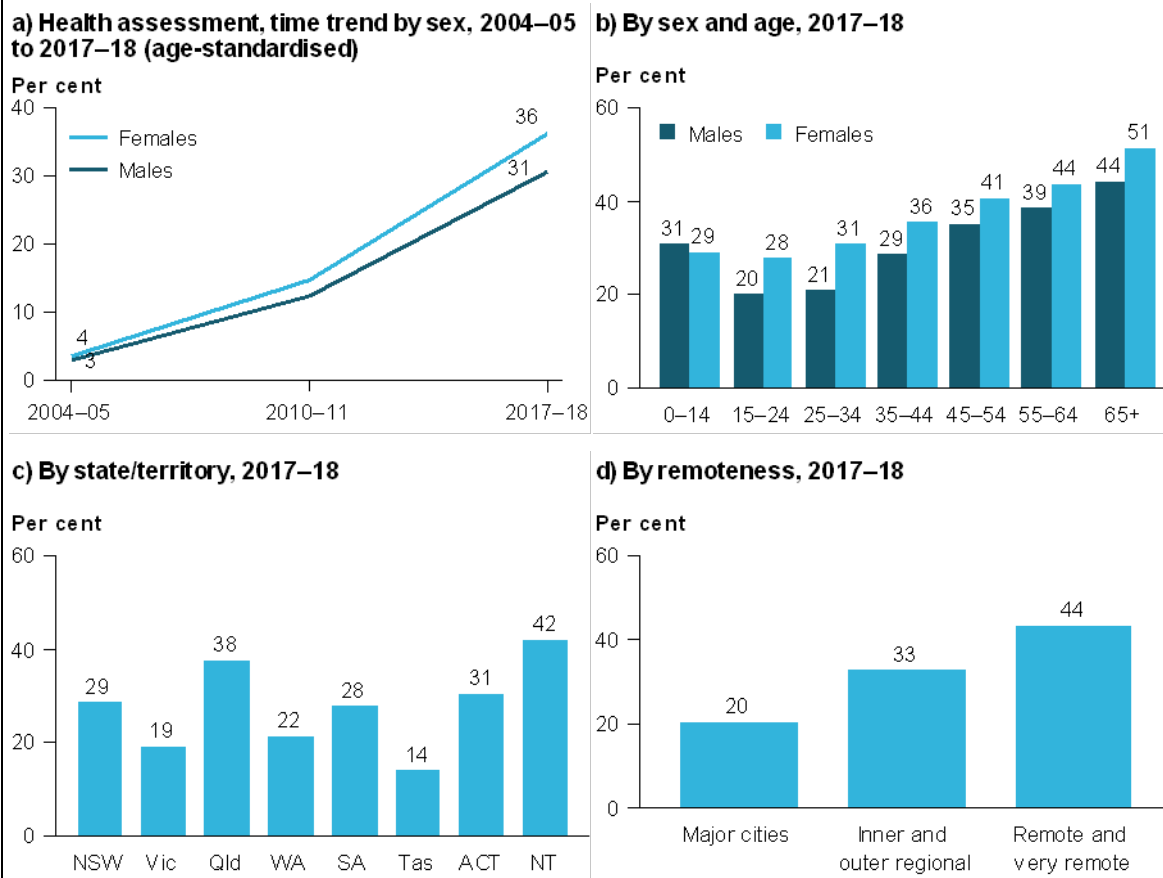
- a higher proportion of Indigenous females than males had a health assessment (Figure 1.1a)
- about one-third (30%) of Indigenous children aged under 15 had a health assessment. Among Indigenous Australians aged 15 and over, the proportion ranged from 24% among those aged 15–24 to 48% among those aged 65 and over (Figure 1.1b depicts these data).

State/territory and remoteness area

In 2017–18, the proportion of Indigenous Australians who had a health assessment was:

- highest in the Northern Territory (42%), and lowest in Tasmania (14%) (Figure 1.1c)
- highest in *Remote and very remote* areas combined (44%), and lowest in *Major cities* (20%) (Figure 1.1d). High availability of private general practitioners (GPs) in major cities may explain the low use of MBS 715 in these areas.

Figure 1.1: Proportion of Indigenous Australians who had an MBS health assessment, by various characteristics



Notes

1. Rates in Figure 1.1a are age-standardised. All other figures show crude rates.
2. Data for these figures are available in the online supplementary tables (tables 1.1a to 1.1d).
3. Indigenous-specific health assessment item 715 is combined with other 'general' health assessments items for the above annual MBS health assessment results.
4. Analyses are based on the date claims were processed as the MBS Indigenous weighted data are based only on period of processing. As such, results for MBS item 715 would not be directly comparable to MBS item 715 results based on date of services.
5. The general health assessments data were adjusted for Indigenous under-identification. General health assessments for non-Indigenous Australians are not directly comparable with Indigenous-specific health assessments.
6. The MBS data reflect billing practices and not necessarily the services provided. For example, MBS data do not generally capture equivalent services provided by jurisdictional-funded primary health care or by public hospitals.

Source: AIHW analysis of MBS Indigenous weighted data.

Measure 1.2: Cardiovascular disease risk assessment

This measure uses data from the nKPI for the Indigenous primary health care data collection. Data are reported on the number and proportion of Indigenous regular clients of Indigenous primary health-care organisations, aged 35–74 and with no known history of cardiovascular disease (CVD):

- who have an absolute CVD risk assessment result recorded within the previous 24 months
- whose CVD risk was categorised as either high (greater than 15% chance of a cardiovascular event in the next 5 years), moderate (10–15% chance of a cardiovascular event in the next 5 years) or low (less than 10% chance of a cardiovascular event in the next 5 years).

This nKPI indicator was collected for the first time in June 2017, and now 3 data points (June 2017, December 2017 and June 2018) are available to report. Results should be treated with caution, as population coverage of CVD risk assessment was low—at 21% nationally (AIHW 2018b). Also, services using the Primary Care Information System (predominantly the Northern Territory Government) are not included in these cardiovascular disease risk assessment results (AIHW 2019a). Details of the nKPI data collection can be found in Appendix A.

Why is it important?

Although CVD is largely preventable, it is the leading cause of death among Indigenous Australians (AIHW 2015b). Multiple modifiable factors (such as smoking status, high blood pressure, and body mass index or BMI) and non-modifiable factors (such as age, sex, family history and social history) contribute to the risk of developing CVD. These factors can be used to categorise an individual's risk of developing CVD, which can then guide treatment decisions. CVD risk factors may be additive, so the assessment of CVD risk should account for multiple risk factors together rather than separately (AIHW 2018b).

Results

Overall

- Nationally, as at June 2018, an estimated 30% of Indigenous regular clients aged 35–74 had a CVD risk assessment result recorded in the previous 2 years that classified them as being at high risk, with 8% at moderate risk and 62% at low risk (Figure 1.2a).
- Between June 2017 and June 2018, the proportion of high-risk clients fell from 33% to 30% (Figure 1.2a).

Age and sex

In June 2018:

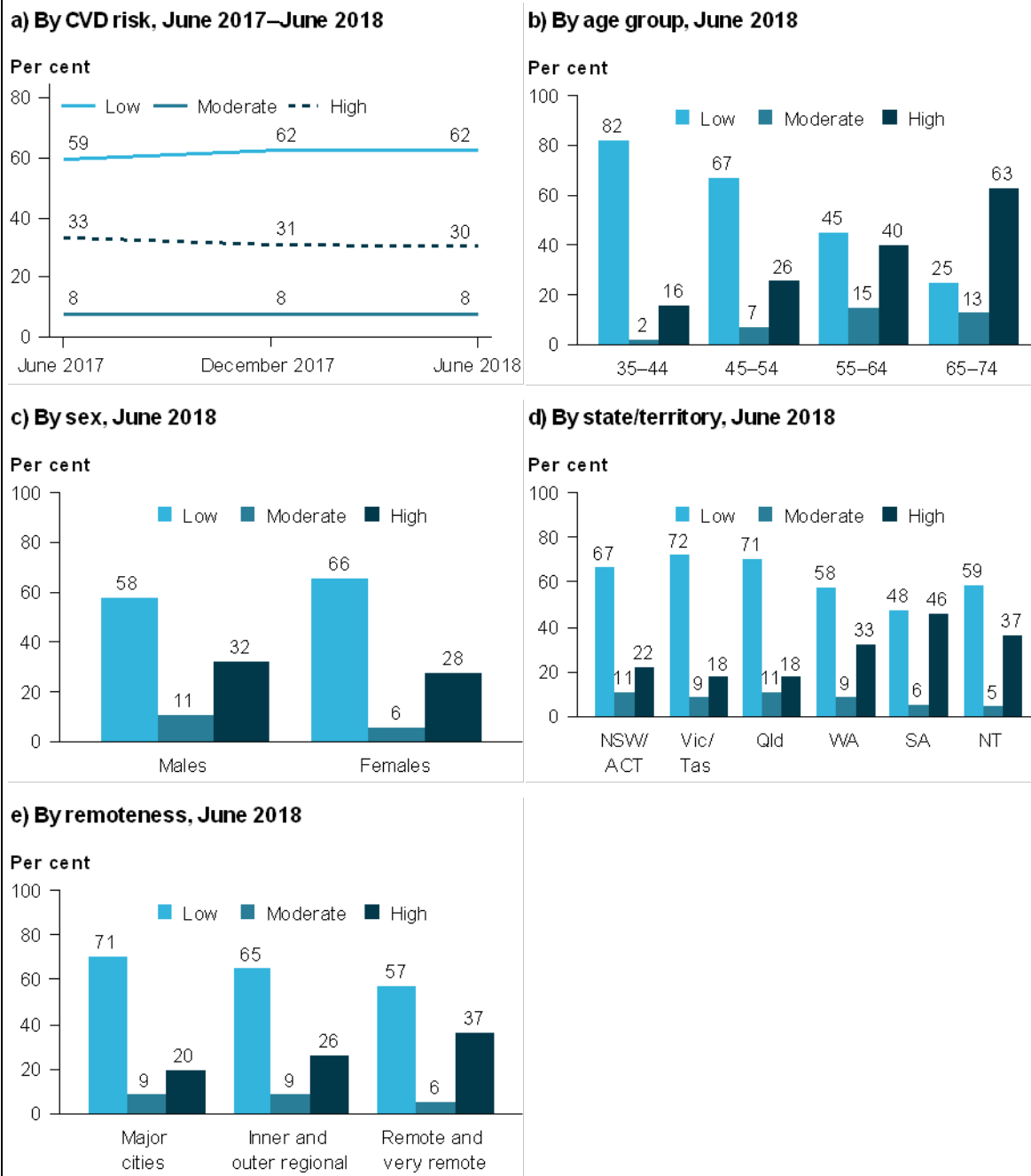
- an estimated 16% of Indigenous regular clients aged 35–44 had a CVD risk assessment result recorded in the previous 2 years that classified them as being at high risk; the proportion was higher (63%) for those aged 65–74 (Figure 1.2b)
- the proportion of low-risk clients was higher for Indigenous women (66%) than Indigenous men (58%). However, men were nearly twice as likely as women (11% compared with 6%) to be classified as being at moderate risk. A slightly higher proportion of men (32%) than women (28%) were classified as being at high risk. (Figure 1.2c).

State/territory and remoteness area

In June 2018, the proportion of high-risk clients was:

- highest for Indigenous clients in South Australia (46%) and lowest in Queensland and Victoria/Tasmania (18%) (Figure 1.2d)
- highest for Indigenous clients in *Remote and very remote* areas combined (37%) and lowest in *Major cities* (20%) (Figure 1.2e).

Figure 1.2: Clients aged 35–74 who had a CVD risk assessment result recorded in the previous 2 years, by CVD risk level and various characteristics, June 2018



Notes

1. Absolute cardiovascular risk assessments can be calculated using the National Vascular Disease Prevention Alliance (NVDPA) or the Central Australian Rural Practitioners Association (CARPA) method. As the CARPA method applies an extra 5% loading for Indigenous Australians, nKPI data should have the 5% loading removed to make the data comparable with NVDPA data. As the Primary Care Information System is unable to deduct the 5% because the data are captured as categorical scores (low, medium, high), organisations using this system (predominantly the Northern Territory Government) are not included in the results presented.
2. Data for these figures are available in the online supplementary tables (tables 1.2a to 1.2e) and in data tables: Preventative health (S2.114, S2.115, S2.116) of the National Key Performance Indicators for Aboriginal and Torres Strait Islander Primary Health Care: results to June 2018.

Source: AIHW nKPI data collection.

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Priority area 2: Timely diagnosis of heart disease and heart failure

Priority area 2 measures are based on the premise that all Aboriginal and Torres Strait Islander people suspected of having heart disease should receive appropriate initial diagnostic services (such as stress testing or coronary angiography for ischaemic heart disease, or echocardiography for heart failure and RHD); these services should be delivered as close to the patient's home where possible, within acceptable time frames according to the level of risk and the patient's condition (BCCF 2014).

The 3 measures recommended for this priority area are:

- measure 2.1 for Medicare-listed cardiac-related diagnostic items
- measure 2.2 for receipt of diagnostic services (data not available to report)
- measure 2.3 for specialist review of suspected/confirmed cardiac disease.

Measure 2.1: Cardiac-related diagnosis

This measure reports on the number and proportion of Indigenous Australians, compared with non-Indigenous Australians, who received 1 or more relevant cardiac-related MBS diagnostic services in the previous 12 months. (Table B2 lists relevant MBS item numbers included in the measure.) Additional MBS items in measure 2.1 (which were included in the third national report) are also included here; hence, results are not comparable with those for the first and second national reports. These additional items, obtained from the Cardiac Services Clinical Committee of the Medical Benefit Schedule Review Taskforce (Department of Health 2017), were used to capture the status of cardiac-related diagnoses more accurately.

Why is it important?

People suspected of having cardiac disease should receive appropriate and timely diagnostic services. Categories of diagnostic tests captured by this measure are:

- diagnostic procedures and investigations—19 MBS items that include various kinds of electrocardiography, and pacemaker and defibrillator testing
- diagnostic imaging services—25 MBS items that include various kinds of echocardiography, computed tomography scans and angiography (Department of Health 2018).

Results

Overall

In 2017–18:

- 89,201 MBS claims for cardiac-related diagnostic items were made for Indigenous Australians (age-standardised proportion of 11%), compared with 4,790,825 claims for non-Indigenous Australians (age-standardised proportion of 9%)
- 64,384 claims for diagnostic procedures and investigations (age-standardised proportion of 12%) and 24,817 claims for diagnostic imaging services (age-standardised proportion of 4.8%) were made for Indigenous Australians—both proportions were similar to those for non-Indigenous Australians (Figure 2.1a).

Time trend

- Between 2004–05 and 2017–18, the age-standardised proportion of those with MBS claims for cardiac-related diagnostic items rose from 7% to 11% for Indigenous Australians and from 7% to 9% for non-Indigenous Australians (Figure 2.1b).

Age and sex

In 2017–18, the proportion of Indigenous Australians who had MBS claims for cardiac-related diagnostic items:

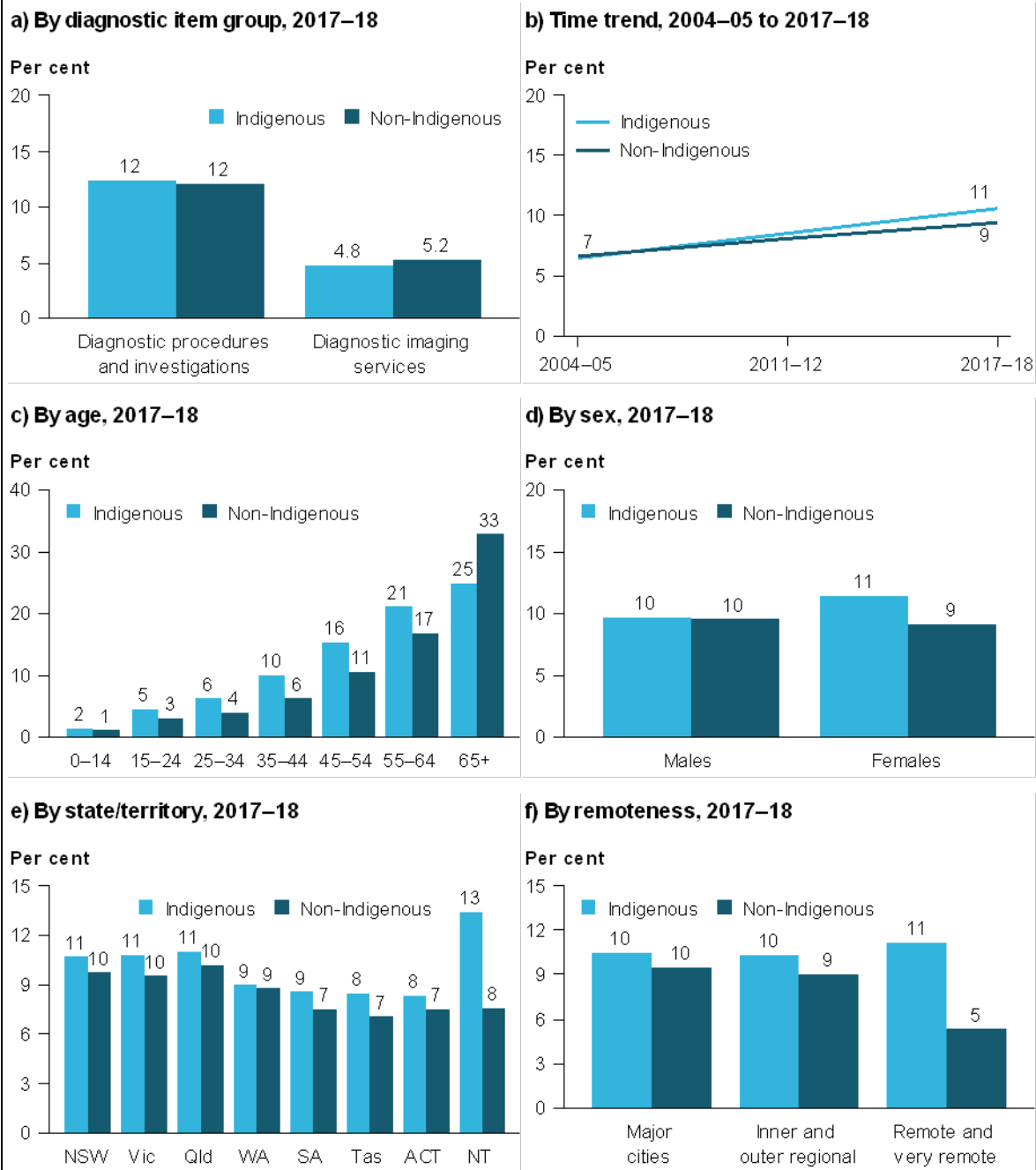
- rose with increasing age, with the lowest proportion among those aged under 25. It was higher than that for non-Indigenous Australians in all age groups, except for those aged 65 and over, where proportions were higher for non-Indigenous Australians (Figure 2.1c)
- was similar for Indigenous and non-Indigenous males, but higher for Indigenous females than non-Indigenous females, with Indigenous females having slightly higher proportions than Indigenous males (Figure 2.1d).

State/territory and remoteness area

In 2017–18, the proportion of Indigenous Australians who had MBS claims for cardiac-related diagnostic items:

- ranged from 8% to 13% across states and territories, and from 10% to 11% across remoteness areas among Indigenous Australians (figures 2.1e and 2.1f)
- were 2 times higher among Indigenous Australians living in *Remote and very remote* areas combined than among their non-Indigenous counterparts (Figure 2.1f).

Figure 2.1: Age-standardised and age-specific proportion of people who claimed cardiac-related MBS diagnostic items, by Indigenous status and various characteristics



Notes

1. Rates in Figure 2.1c are age specific and therefore not age standardised. All other figures show age-standardised rates.
2. Data for these figures are available in the online supplementary tables (tables 2.1a–2.1f).
3. The MBS data reflect billing practices and not necessarily the services provided. For example, MBS data do not generally capture equivalent services provided by jurisdictional-funded primary health care or by public hospitals.
4. The MBS data were adjusted for Indigenous under-identification.

Source: AIHW analysis of MBS Indigenous weighted data.

Measure 2.3: Suspected or confirmed cardiac disease case reviewed by a specialist

This measure reports on the number and proportion of people with suspected or confirmed cardiac disease reviewed by a specialist in the relevant financial year. Unlike the third national report, this fourth report reports on review by a specialist rather than by a cardiologist only, as the necessary MBS items for cardiologist review are not available in the MBS Indigenous weighted data.

A proxy measure for identifying suspected or confirmed cardiac cases was used by selecting cardiac-related MBS claims for diagnostic or therapeutic procedure items.

(Table B2 lists relevant MBS item numbers included in the measure.)

Why is it important?

Specialists play a critical role in diagnosing and treating people with cardiac disease. Improving the level of access to specialist services is very important to improve timeliness and accuracy of the diagnosis of cardiac diseases, especially for Indigenous Australians.

Results

Overall

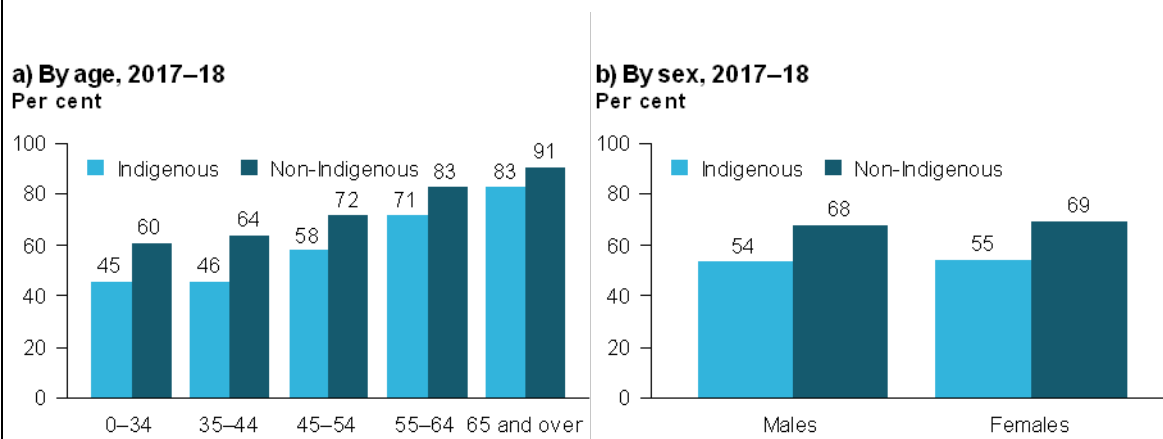
- In 2017–18, an estimated 100,166 Indigenous Australians, and 5,037,347 non-Indigenous Australians had suspected/confirmed cases of cardiac disease, of which 54% and 68% (age-standardised proportions), respectively, were reviewed by a specialist.

Age and sex

In 2017–18:

- the proportion of people who received a specialist review increased with age, for both Indigenous Australians (from 45% in those aged 0–34 to 83% in those aged 65 and over) and non-Indigenous Australians (equivalently, from 60% to 91%) (Figure 2.3a)
- a slightly higher proportion of females than males were reviewed by a specialist, for both Indigenous and non-Indigenous Australians (Figure 2.3b).

Figure 2.3: Age-specific and age-standardised proportion of people with suspected/confirmed cardiac disease who were reviewed by a specialist, by Indigenous status, age, and sex, 2017–18



Notes

1. Rates in Figure 2.3a are age specific and therefore not age standardised. Rates in Figure 2.3b are age standardised.
2. Data for these figures are available in the online supplementary tables (tables 2.3a–2.3b).
3. The MBS data reflect billing practices and not necessarily the services provided. For example, MBS data do not generally capture equivalent services provided by jurisdictional-funded primary health care or by public hospitals.
4. The MBS data were adjusted for Indigenous under-identification.

Source: AIHW analysis of MBS Indigenous weighted data.

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Priority area 3: Guideline-based therapy for acute coronary syndrome

Priority area 3 measures are based on the premise that all Aboriginal and Torres Strait Islander people with acute coronary syndrome (ACS) should receive guideline-based therapy (BCCF 2014). ACS includes a broad spectrum of acute clinical presentations, ranging from unstable angina to acute myocardial infarction (AMI).

Data from the National Hospital Morbidity Database (NHMD) are to do with separations (see Glossary) (not individuals); it is not possible to group associated hospitalisations without data linkage. Priority area 3 measures exclude hospitalisations ending in a transfer to another acute hospital to reduce double-counting of people with ACS. As such, only the 'last' hospitalisation for each ACS event is generally counted. However, separate hospitalisations without transfers are counted separately; for example, if a person had 2 ACS events in 1 year, both would be counted. Likewise, if a person had 2 ACS events in a year but had 3 separations due to a transfer to another hospital, then only 2 separations would be counted (see Appendix A for further details; tables B3 and B4 present classification codes used for these measures).

The 5 measures recommended for this priority area are:

- measure 3.1 for ST-segment-elevation myocardial infarction (STEMI) events treated by percutaneous coronary intervention (PCI)
- measure 3.2 for ST-segment-elevation myocardial infarction (STEMI) events who were not provided any reperfusion therapy (data not available to report)
- measure 3.3 for acute coronary syndrome events that included diagnostic angiography or definitive revascularisation
- measure 3.4 for acute coronary syndrome patients discharged from hospital on appropriate secondary prevention medicines (data not available to report)
- measure 3.5 for acute myocardial infarction in-hospital mortality rates.

Measure 3.1: ST-segment-elevation myocardial infarction events treated by percutaneous coronary intervention

This measure reports on the number and proportion of hospitalised events where PCI (a procedure to restore blood flow to a blocked coronary artery) was provided to patients aged 18 and over for STEMI (in other words, severe heart attack).

Why is it important?

When a person's heart attack is because the artery supplying blood to an area of the heart muscle is blocked, a PCI should be undertaken where clinically appropriate. In general, if access to PCI is not available within recommended time frames, a medicine that dissolves blood clots (fibrinolysis) should be offered (ACSQHC 2014).

A major factor in choosing PCI as treatment over fibrinolysis is timing, including time delays in seeking medical help, in transportation and in receiving PCI (Aroney et al. 2006). A broad variety of cultural and systemic factors are thought to contribute to delays in treatment among Indigenous Australians, many of which are exacerbated by remoteness area (Ilton et al. 2014).

Results

Overall

Between 2014–15 and 2016–17:

- there were 1,068 hospitalised events for STEMI among Indigenous adults (4% of all hospitalised STEMI events), with 65% (crude rate) of those treated by PCI
- based on age-standardised proportions, 64% of hospitalised STEMI events among Indigenous adults were treated by PCI, compared with 79% of such events for non-Indigenous adults (rate ratio of 0.8) (Figure 3.1a).

Time trend

- Between 2004–05 and 2016–17, the age-standardised proportion of hospitalised STEMI events treated by PCI among Indigenous adults rose from 26% to 73%, and from 53% to 81% among non-Indigenous adults (Figure 3.1b).

Age and sex

Between 2014–15 and 2016–17, the treatment of hospitalised STEMI events by PCI:

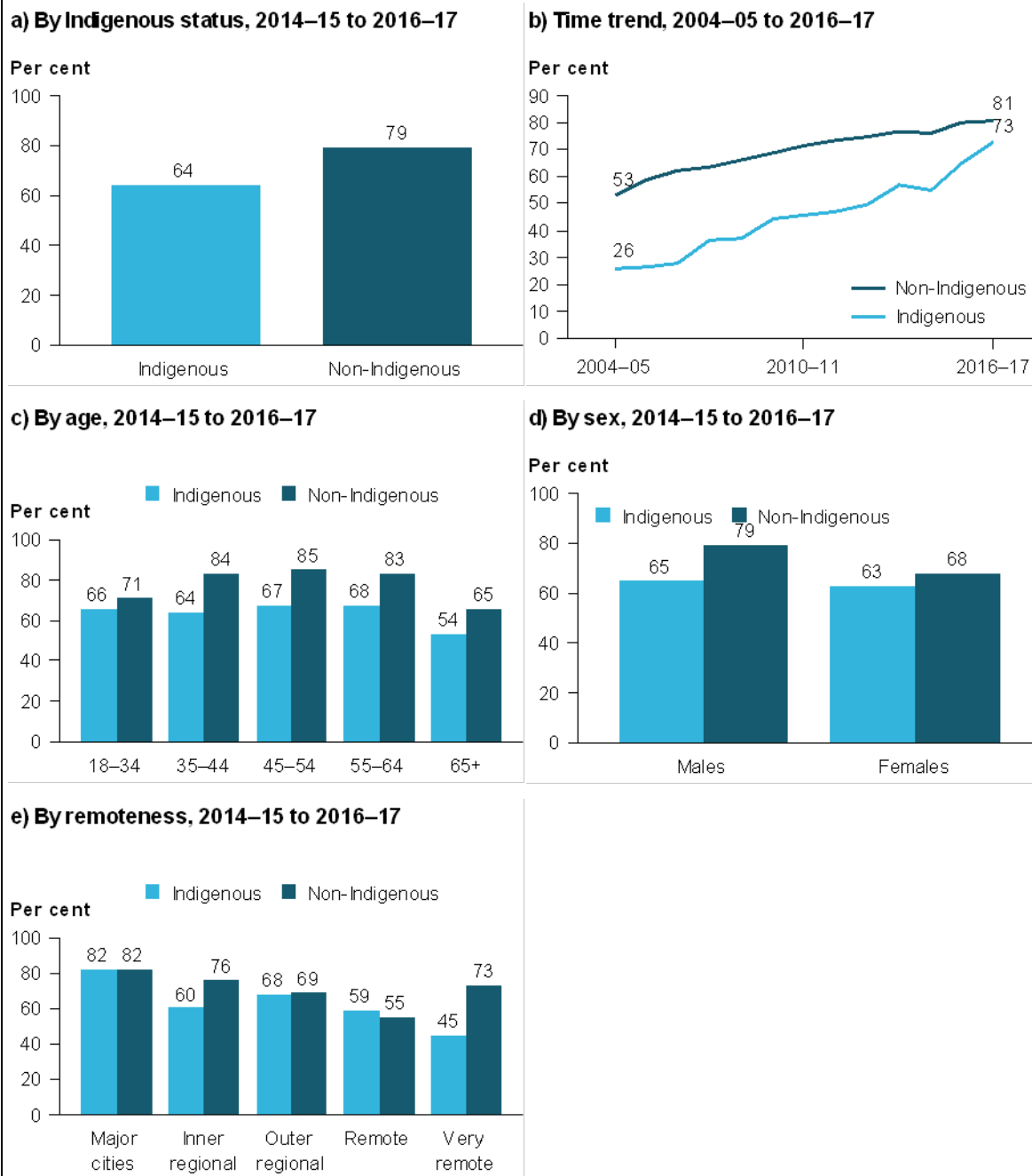
- was lower for Indigenous adults than non-Indigenous adults across all age groups (Figure 3.1c)
- was lowest for those aged 65 and over, regardless of Indigenous status (Figure 3.1c)
- was higher among both non-Indigenous men and women than among Indigenous men and women (Figure 3.1d).

Remoteness area

Between 2014–15 and 2016–17, the age-standardised proportion of hospitalised STEMI events treated by PCI:

- fell with increasing remoteness (from 82% in *Major cities* to 45% in *Very remote* areas for Indigenous adults)
- resulted in the gap between Indigenous and non-Indigenous adults being widest in *Very remote* areas (Figure 3.1e).

Figure 3.1: Age-standardised and age-specific proportion of hospitalised events for STEMI among people aged 18 and over who were treated by PCI, by Indigenous status and various characteristics



Notes

1. The time series analysis shown in Figure 3.1b is for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined. The analyses shown in the other figures include data for all jurisdictions (see Appendix A).
2. Rates in Figure 3.1c are age specific and therefore not age standardised; all other figures show age-standardised rates.
3. Data for these figures are available in the online supplementary tables (tables 3.1a to 3.1e).
4. The NHMD includes data on hospitalisations and not people, so the number of people is an estimate only. Hospitalisations ending in transfer to another acute hospital were excluded, so that only the 'last' hospitalisation episode is counted. PCIs are also performed in a non-admitted patient setting, but these are not captured in the NHMD.
5. There is some under-identification of Indigenous Australians in the NHMD. Eligibility for reperfusion therapy cannot be determined using NHMD data.

Source: AIHW NHMD.

Measure 3.3: Acute coronary syndrome events that included diagnostic angiography or definitive revascularisation

This measure reports on the number and proportion of hospitalised events for ACS among people aged 18 and over that included diagnostic angiography and/or a definitive revascularisation procedure—that is, a PCI or coronary artery bypass graft (CABG) (which is open heart surgery with grafting of vessels).

Why is it important?

Diagnostic angiography and definitive revascularisation procedures are essential forms of diagnosis and treatment for ACS, and timely use of these procedures can save many lives (BCCF 2014; NHFA & CSANZ 2016).

Barriers to accessing timely ACS treatment can be explained, in part, by geographical disparity in services. Mapping of cardiac services suggests that 60% of Indigenous Australians cannot access a PCI-capable hospital within an hour's drive of their home (Clark et al. 2012). But differences in cardiac procedure rates have also been found to be affected by other factors, such as comorbid conditions and severity of the condition (Cunningham 2002; Randall et al. 2013).

Results

Overall

Between 2014–2015 and 2016–2017:

- 5,751 hospitalised events for ACS among people aged 18 and over were for Indigenous Australians (5% of all ACS events), of which 51% (crude rate) included diagnostic angiography (27% PCI; 4% CABG) and 53% included at least 1 diagnostic angiography or definitive revascularisation procedure
- the age-standardised proportion of hospitalised ACS events among Indigenous adults receiving a diagnostic angiography and/or a definitive revascularisation procedure was 55%, compared with 67% for non-Indigenous adults (rate ratio of 0.8) (Figure 3.3a).

Time trend

- Between 2004–05 and 2016–17, the age-standardised proportion of hospitalisations for ACS events among Indigenous adults that included either a diagnostic angiography or a definitive revascularisation procedure rose from 32% to 58%, compared with a rise from 45% to 67% among non-Indigenous adults (Figure 3.3b).

Age and sex

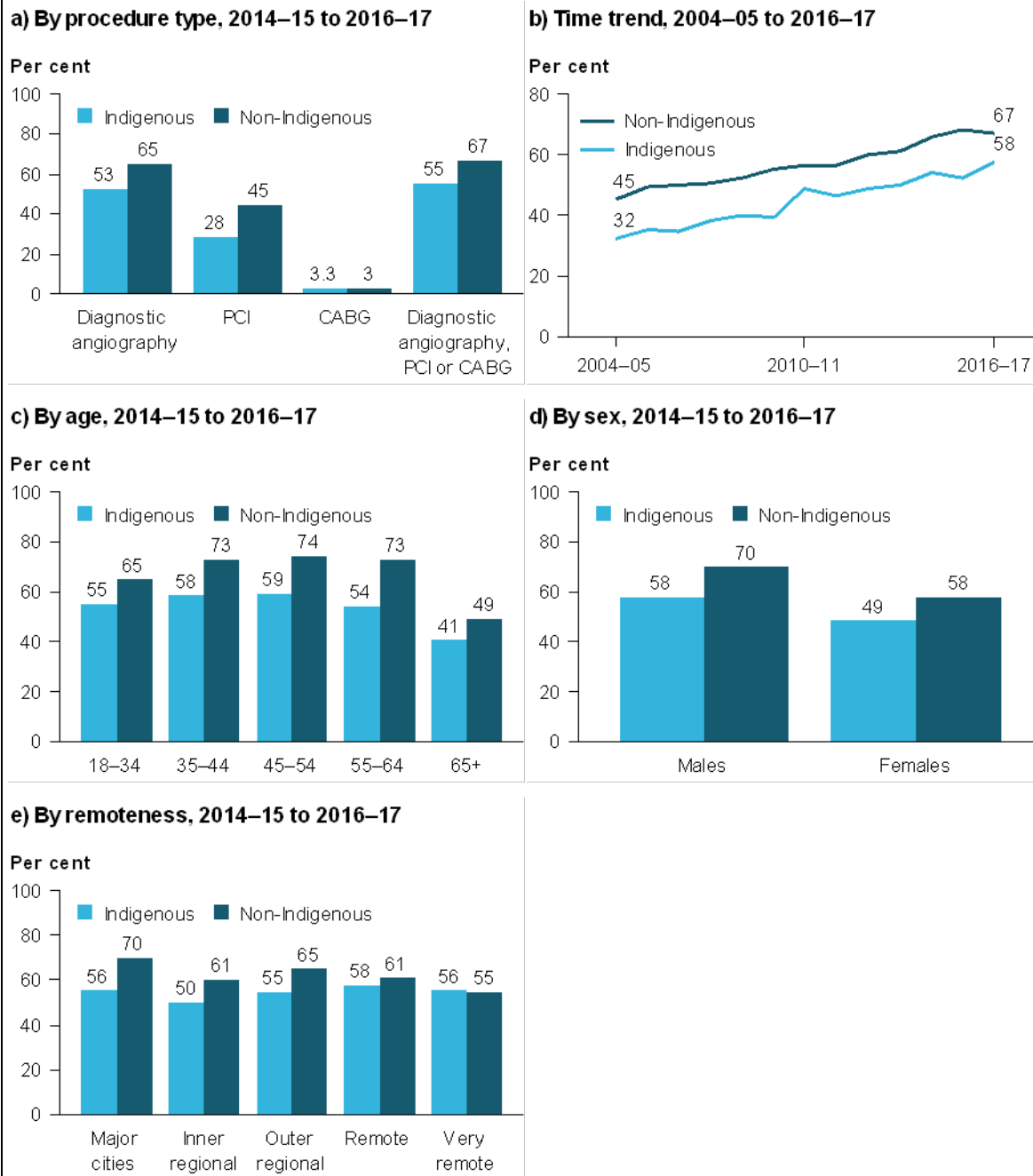
Between 2014–15 and 2016–17:

- the proportion of hospitalised ACS events that included diagnostic angiography or a definitive revascularisation procedure was lower for Indigenous adults than for non-Indigenous adults in all age groups (Figure 3.3c)
- non-Indigenous men and women had higher rates of diagnostic angiography or definitive revascularisation procedures than their Indigenous counterparts (Figure 3.3d).

Remoteness area

- Between 2014–15 to 2016–17, except for *Very remote* areas, the age-standardised proportions of hospitalised ACS events for Indigenous adults who received a diagnostic angiography or a definitive revascularisation procedure were lower than that for non-Indigenous adults, although proportions in *Remote* areas were similar (Figure 3.3e).

Figure 3.3: Age-standardised and age-specific proportion of hospitalised events among people aged 18 and over who had ACS and were treated by PCI and/or CABG, by Indigenous status and various characteristics



Notes

1. The time series analysis shown in Figure 3.3b is for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined. The analyses shown in the other figures include data for all jurisdictions (see Appendix A).
2. Rates in Figure 3.3c are age specific and therefore not age standardised; all other figures show age-standardised rates.
3. Data for these figures are available in the online supplementary tables (tables 3.3a to 3.3e).
4. The NHMD includes data on hospitalisations, so the number of people is an estimate only. Hospitalisations ending in transfer to another acute hospital were excluded. The proportion of ACS patients who receive angiography or revascularisation might be underestimated. PCIs are also performed in a non-admitted patient setting, but these are not captured in the NHMD.
5. There is some under-identification of Indigenous Australians in the NHMD.

Source: AIHW NHMD.

Measure 3.5: Acute myocardial infarction in-hospital mortality rates

This measure reports on the mortality rate of separations for acute myocardial infarction (AMI) among patients aged 35 and over that ended with death, by Indigenous status.

Why is it important?

AMI is a heart attack that has caused the death of some heart muscle. Improvements in treatment for people with AMI reduce the mortality rate over both the short and long term (Ong & Weeramanthri 2000; Tideman et al. 2014).

Results

Overall

Between 2014–15 and 2016–17:

- about 4% (crude rate) of hospitalisations for AMI among Indigenous Australians aged 35 and over ended with death (137 deaths)
- the age-standardised in-hospital death rate was similar for Indigenous adults and non-Indigenous adults (3% versus 2.8%, respectively), with a rate ratio of 1.1 (Figure 3.5a).

Time trend

- Between 2005–08 and 2014–17, the age-standardised in-hospital death rate fell among both Indigenous adults (from 4% to 3%) and non-Indigenous adults (5% to 2.8%) (Figure 3.5b).

Age and sex

Between 2014–15 and 2016–17:

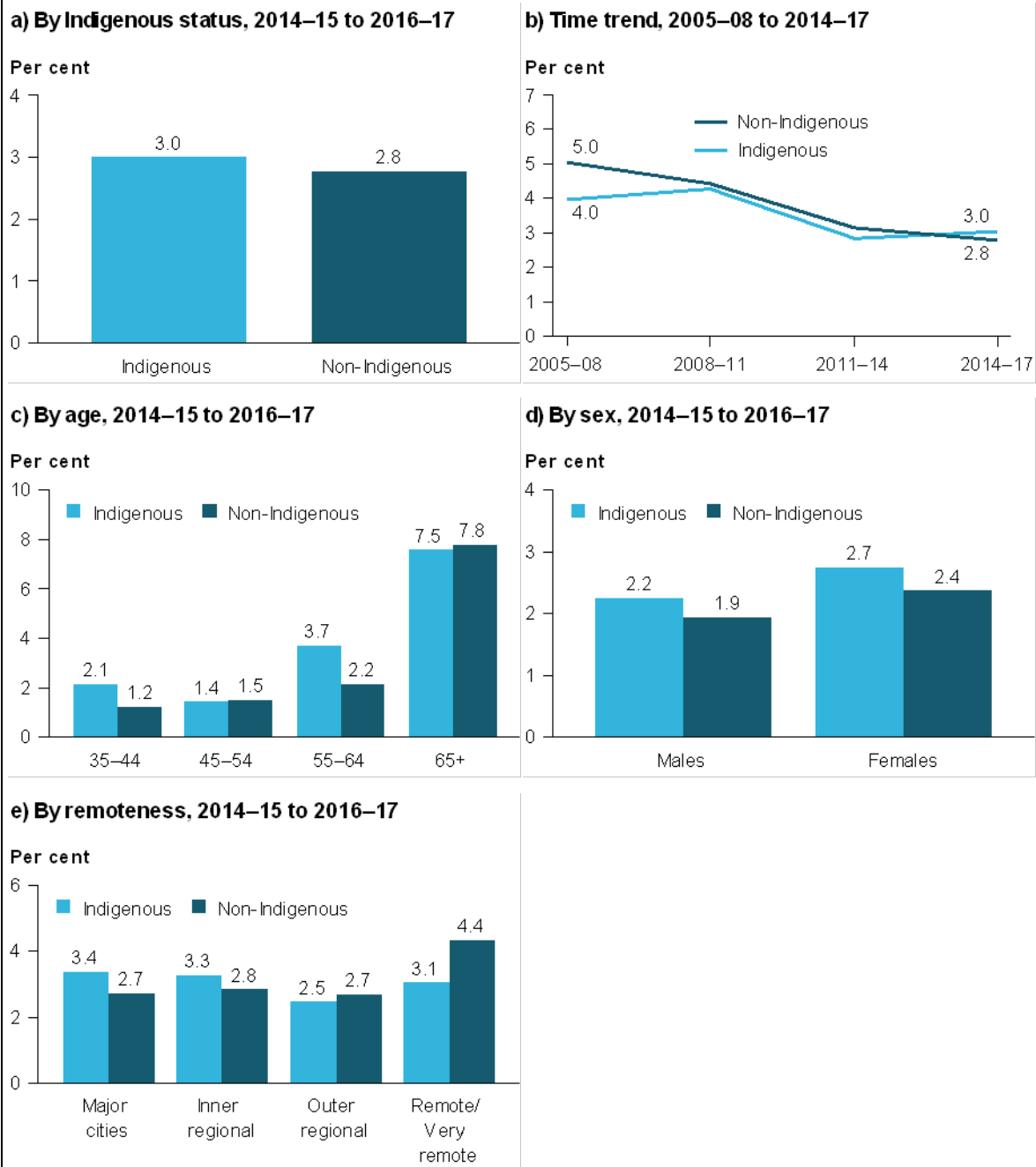
- Indigenous Australians aged 35–44 and 55–64 had higher in-hospital death rates than non-Indigenous Australians. In-hospital death rates were slightly higher for non-Indigenous Australians aged 45–64 and similar for Indigenous and non-Indigenous Australians aged over 65 (Figure 3.5c).
- the age-standardised in-hospital death rate was slightly lower for non-Indigenous men and women than for their Indigenous counterparts (Figure 3.5d).

Remoteness area

Between 2014–15 to 2016–17:

- the age-standardised in-hospital death rate among Indigenous adults ranged from 2.5% in *Outer regional* areas to 3.4% in *Major cities*.
- compared with non-Indigenous adults, age-standardised in-hospital death rates were lower for Indigenous adults in *Outer regional* and *Remote and very remote* areas combined, and were similar in *Major cities* and *Inner regional* areas (Figure 3.5e).

Figure 3.5: Age-standardised and age-specific rate of hospitalised events for AMI among people aged 35 and over that ended with the death of the patient, by Indigenous status and various characteristics



Notes

1. Data for these figures are for New South Wales, Victoria, Queensland, Western Australia, South Australia, and the Northern Territory combined.
2. Rates in Figure 3.5c are age specific and therefore not age standardised; all other figures show age-standardised rates.
3. Data for these figures are available in the online supplementary tables (tables 3.5a to 3.5e).
4. Data broken down by state and territory could not be provided, as they were not comparable due to different practices for recording deaths in the NHMD. In-hospital morbidity rates might also be affected by different approaches to pre- and post-hospital care, so should be interpreted in the context of overall cardiac mortality. The NHMD does not include information on cause of death.
5. While the indicator refers to proportions of people, the data presented for this indicator are based on proportions for hospitalisations. Hospitalisations ending in transfer to another acute hospital were excluded.
6. There is some under-identification of Indigenous Australians in the NHMD.

Source: AIHW NHMD.

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Priority area 4: Optimisation of health status and provision of ongoing preventive care

Priority area 4 measures are based on the premise that all Aboriginal and Torres Strait Islander people with cardiac conditions should receive ongoing multidisciplinary primary health care and specialist physician follow-up as required, to prevent further illness, and to optimise health status (BCCF 2014).

The 4 measures recommended for this priority area are:

- measure 4.1 for review by a primary health-care professional after discharge from hospital (data not available to report)
- measure 4.2 for follow-up after receiving a cardiovascular therapeutic procedure
- measure 4.3 for specialist physician review after a cardiovascular therapeutic procedure
- measure 4.4 for patients with coronary heart disease discharged on secondary prevention medications (data not available to report).

Measure 4.2: Follow-up after receiving a cardiovascular therapeutic procedure

This measure reports on the number and proportion of patients with a cardiac condition who received a follow-up service within 12 months of having a cardiovascular therapeutic procedure (as measured through MBS claims).

MBS follow-up items include team care arrangement, GP management plans, allied health services items, and practice nurse services. (Table B2 contains a full list of items.)

This measure could not be fully reported as the data linkage between MBS and hospital data is currently under development and not yet available for use. Information for this measure was partially available from the MBS database.

The definition of this measure in this and the third annual report differs from that in the first and second annual reports. It was previously reported as the 'number and proportion of patients with a cardiac condition who received the following MBS chronic disease management items: team care arrangement, GP management plan, and allied health services items'. The definition was changed to better reflect the purpose of the agreed measure.

Why is it important?

Secondary prevention—which includes a broad variety of multidisciplinary interventions and disease management (such as team care arrangements and GP management plans)—is important to reduce the recurrence of cardiac events or complications in patients with an established cardiac condition diagnosis. These interventions have been shown to reduce hospital readmission and mortality rates (NHFA 2010).

Results

Overall

In 2016-17:

- an estimated 1,081 Indigenous Australians and 114,386 non-Indigenous Australians made an MBS claim for a cardiovascular therapeutic procedure
- about 66% of Indigenous Australians and 49% of non-Indigenous Australians made an MBS claim for follow-up services within 12 months after a cardiovascular therapeutic procedure.

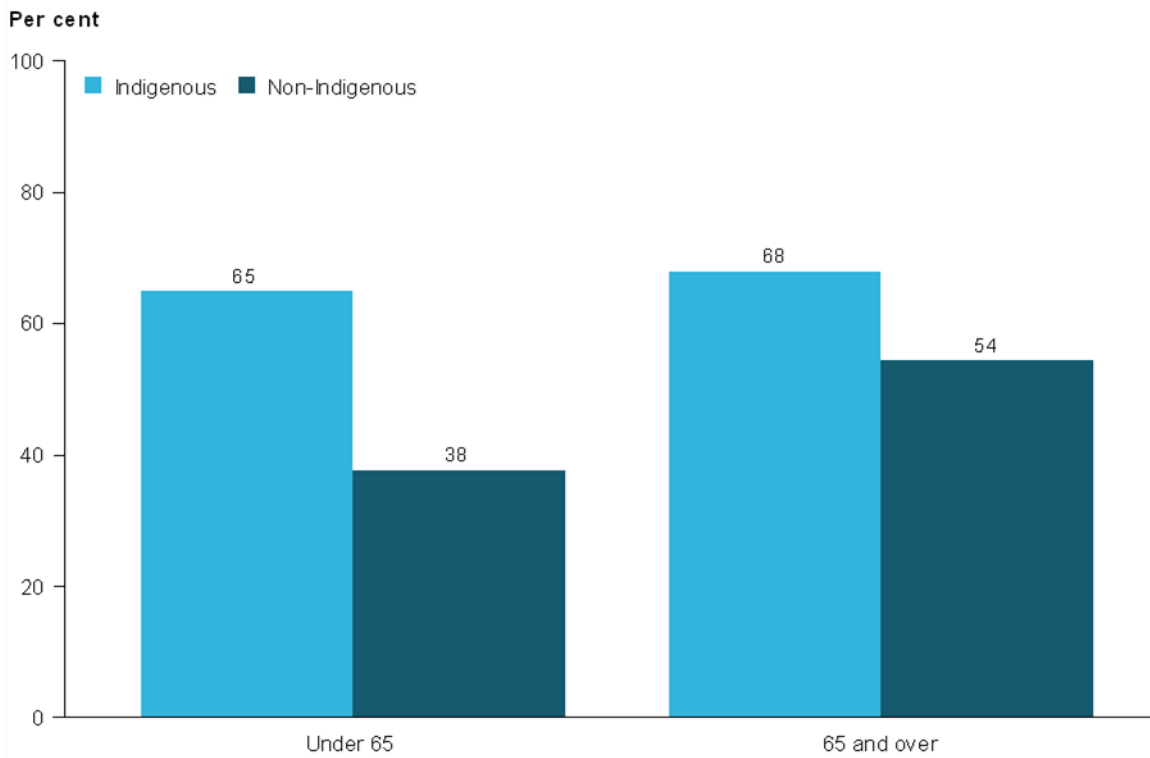
Age

In 2016–17:

- about 65% of Indigenous Australians and 38% of non-Indigenous Australians aged under 65 made an MBS claim for follow-up services within 12 months after a cardiovascular therapeutic procedure. Among those aged 65 and over, the proportions were 68% for Indigenous Australians and 54% for non-Indigenous Australians (Figure 4.2).

Due to small numbers, analysis could not be done for other subpopulations.

Figure 4.2: Proportion of people who had follow-up MBS services within 12 months of a cardiovascular therapeutic procedure in 2016-17, by Indigenous status and age



Notes

1. Rates in this figure are crude.
2. Data for this figure are available in the online supplementary tables (Table 4.2).
3. The MBS data reflect claiming practices, and not necessarily services provided.
4. The MBS data were adjusted for Indigenous under-identification.
5. As some of the MBS items used to identify people with a cardiac condition are diagnostic, not all people with these items would have cardiac conditions (as some of the tests would have been negative).

Source: AIHW analysis of MBS data.

Measure 4.3: Specialist physician review after a cardiovascular therapeutic procedure

This measure reports on the number and proportion of patients with a cardiac condition who were reviewed by a specialist physician within 12 months of a cardiovascular therapeutic procedure (as captured through MBS claims).

This measure could not be fully reported, because the data linkage between MBS and hospital data is currently under development and not yet available for use. Information for this measure was partially available from the MBS database.

Why is it important?

Substantial evidence shows that integrated cardiac and specialist services within a general practice setting, combined with increased use of specialist services, is highly effective in reducing cardiovascular disease mortality and morbidity, and improves quality of life.

Results

Overall

In 2016–17:

- an estimated 1,081 Indigenous Australians and 114,386 non-Indigenous Australians made an MBS claim for a cardiovascular therapeutic procedure
- about 83% of Indigenous Australians and 96% of non-Indigenous Australians made an MBS claim for specialist services within 12 months after a cardiovascular therapeutic procedure.

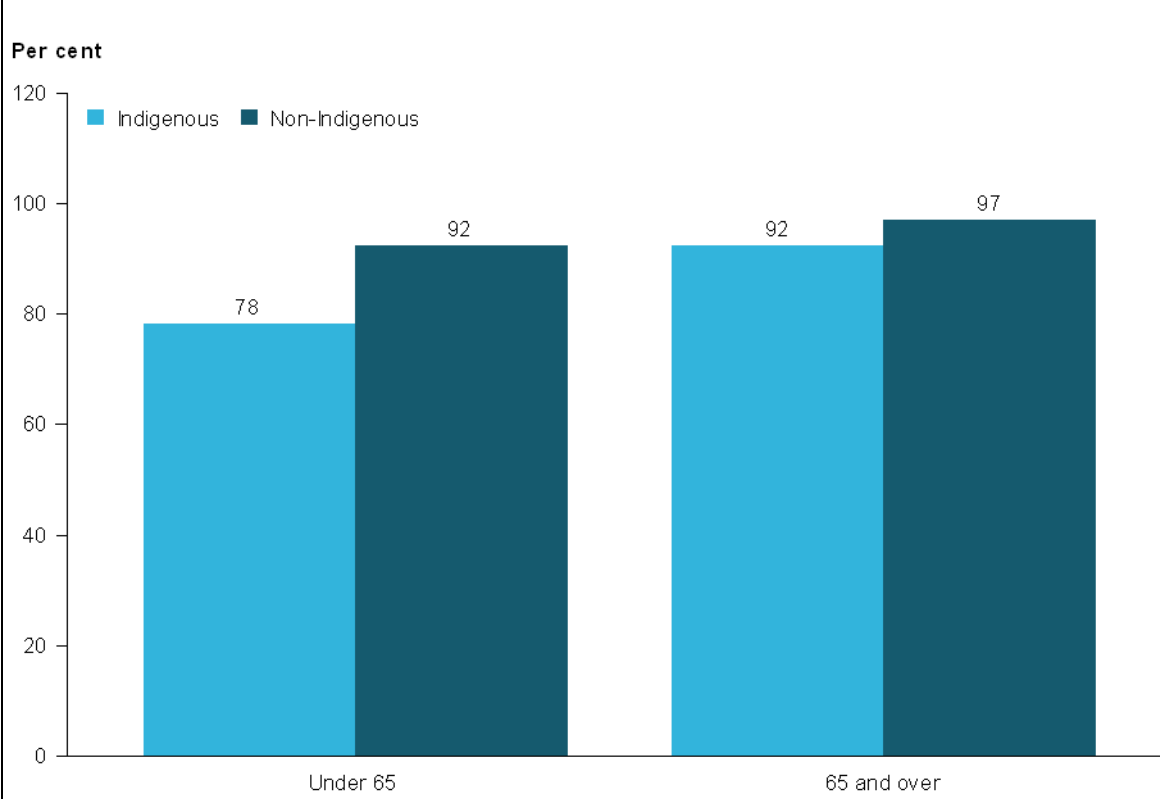
Age

In 2016-17:

- about 78% of Indigenous Australians and 92% of non-Indigenous Australians aged under 65 made an MBS claim for specialist services within 12 months after a cardiovascular therapeutic procedure (Figure 4.3)
- among those aged 65 and over, the proportions were 92% for Indigenous Australians and 97% for non-Indigenous Australians (Figure 4.3).

Due to small numbers, analysis could not be done for other subpopulations.

Figure 4.3: Proportion of people who were reviewed by a specialist physician within 12 months of a cardiovascular therapeutic procedure in 2016-17, by Indigenous status and age



Notes

1. Rates in this figure are crude.
2. Data for this figure are available in the online supplementary tables (Table 4.3).
3. The MBS data reflect claiming practices, and not necessarily services provided.
4. The MBS data were adjusted for Indigenous under-identification.

Source: AIHW analysis of MBS data.

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Priority area 5: Strengthening the diagnosis, notification and follow-up of rheumatic heart disease

Priority area 5 measures are based on the premise that:

- all Aboriginal and Torres Strait Islander people suspected to have acute rheumatic fever (ARF) or RHD should receive an echocardiogram as early as possible
- new cases should be automatically reported to a central register to help track patients and ensure ongoing care.

Previously, data for this section were separately supplied to the AIHW from each individual state-based rheumatic heart disease register. Information from the RHD registers in each jurisdiction are now compiled by the AIHW, with analysis performed in house. For the first time, the data were sourced directly from the National RHD data collection, which has been held by the AIHW since mid-2018. Data are provided by registers in Queensland, Western Australia, South Australia and the Northern Territory (AIHW 2019b). Details of the National RHD data collection are available in Appendix A.

With the compilation of a national collection, it is possible for duplicate cases between states and territories to be identified and removed. As some people with ARF/RHD are mobile, and because of the long-term nature of the disease and follow-up, the same ARF episode may be recorded in multiple jurisdictions. Data analysis at a national level has allowed for the removal of duplicate cases and improved the accuracy of the data. Improved consistency between data definitions may have caused changes in some analyses, also resulting in different results.

As a result of these changes, information presented in this section is not comparable with the content of previous reports.

The 4 measures recommended for this priority area are:

- measure 5.1 for the annual incidence of ARF and RHD
- measure 5.2 for recurrent ARF
- measure 5.3 for preventive treatment with benzathine penicillin G doses
- measure 5.4 for echocardiograms among patients with severe or moderate RHD (data not available to report).

Data custodians indicated that difficulty in obtaining echocardiogram reports from multiple external data sources means that data are incomplete; therefore, updated data on echocardiograms performed on RHD cases (measure 5.4) are not provided in this report. The data in the National RHD data collection underestimates echocardiography performed on RHD cases and should not be used to estimate compliance with ARF and RHD key performance indicators.

Measure 5.1: Annual incidence of acute rheumatic fever and rheumatic heart disease

This measure reports on the incidence (first known and recurrent) of ARF, and newly diagnosed cases of RHD.

Rates comparing the Indigenous and non-Indigenous population have not been adjusted for differences in age structure, as age-standardised rates could not be calculated due to small numbers among the non-Indigenous population.

Why is it important?

ARF is the result of an autoimmune response to a group A streptococcus (GAS) bacterial infection (Parnaby & Carapetis 2010). It can cause permanent damage to the heart muscle and heart valves, known as RHD. There is no diagnostic laboratory test for ARF, so its diagnosis is based on a clinical decision.

While it is very rarely seen among non-Indigenous Australians, it is common among Indigenous Australians, and is emblematic of Indigenous disadvantage. ARF and RHD have been linked to socioeconomic disadvantage and, in particular, to household overcrowding (Coffey et al. 2018; Jaine et al. 2011; RHD Australia et al. 2012). Indigenous Australians are more likely than non-Indigenous Australians to be living in overcrowded households, especially those with lower household incomes (AHMAC 2017).

Primary prevention of RHD involves timely treatment of GAS infections, and effectively treating the infections to prevent ARF from developing (RHD Australia et al. 2012).

Results: Incidence of first known and recurrent ARF in Queensland, Western Australia, South Australia, and the Northern Territory combined

Overall

In 2017:

- 484 episodes of ARF were reported for Indigenous Australians (a rate of 111 per 100,000 population)
- 42 ARF episodes were reported for non-Indigenous Australians (a rate of 0.5 per 100,000 population) (Figure 5.1.1a).

Time trend

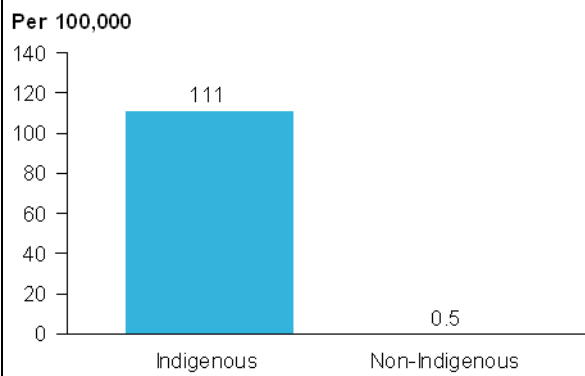
- Between 2013 and 2017, the incidence of ARF among Indigenous Australians rose from 63 to 111 per 100,000 population (Figure 5.1.1b). The reason for this rise is unclear, but it may be due to better reporting and registration of ARF in recent years.

Age

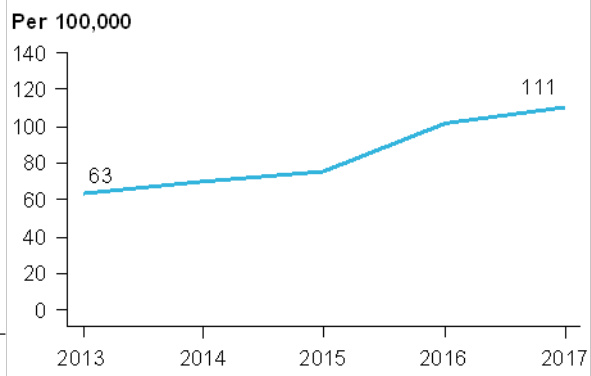
- In 2017, the incidence rate of ARF in Indigenous Australians was highest among the youngest age group (0–14), and fell with age (was lowest among those aged over 45) (Figure 5.1.1c).

Figure 5.1.1: Incidence of ARF, by various characteristics

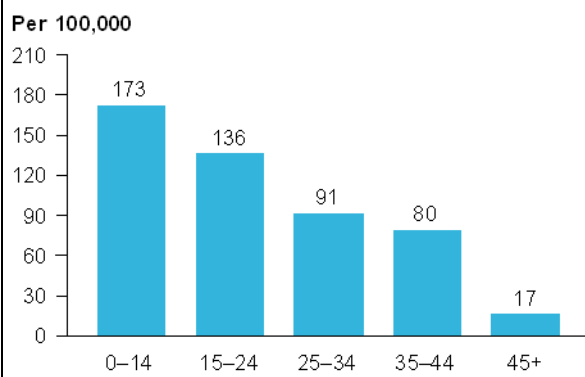
a) By Indigenous status, 2017



b) Indigenous, time trend, 2013 to 2017



c) Indigenous, by age, 2017



Notes

1. Data for these figures are for Queensland, Western Australia, South Australia, and the Northern Territory combined.
2. The rates in Figure 5.1.1a have not been adjusted for differences in age structure between the Indigenous and non-Indigenous populations.
3. Data for these figures are available in the online supplementary tables (tables 5.1.1a to 5.1.1c).
4. Incidence includes both first known ARF episodes and recurrent episodes and include all confirmation statuses (definite, probable and possible).

Sources: AIHW analysis of the National RHD data collection.

Results: New diagnoses of RHD in Queensland, Western Australia, South Australia, and the Northern Territory combined

Overall

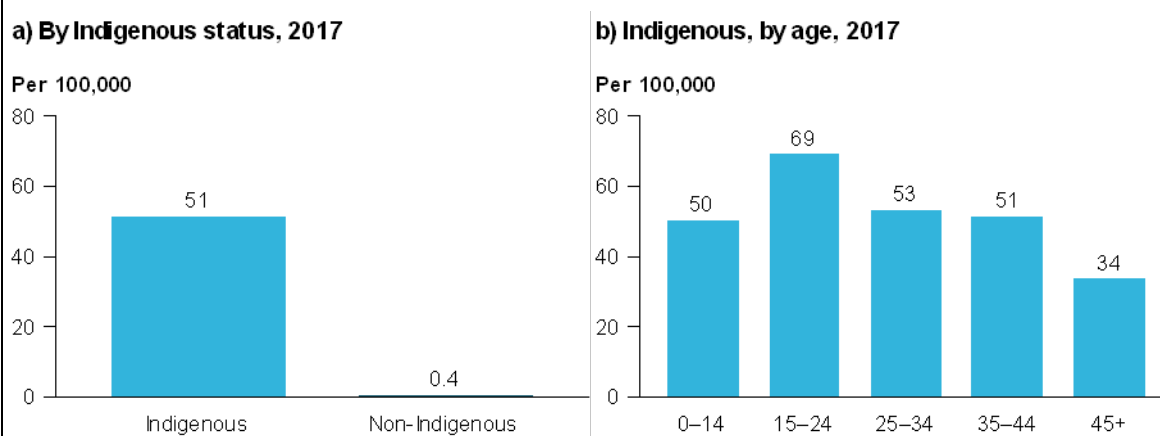
In 2017:

- 224 new RHD diagnoses were reported for Indigenous Australians (a rate of 51 per 100,000 population)
- 34 new RHD diagnoses were reported for non-Indigenous Australians (a rate of 0.4 per 100,000 population) (Figure 5.1.2a).

Age

- In 2017, the incidence rate of new RHD diagnoses for Indigenous Australians was highest among the 15–24 age group and was lowest among those aged over 45 (Figure 5.1.2b).

Figure 5.1.2: New diagnoses of RHD, by various characteristics



Notes

1. Data for these figures are for Queensland, Western Australia, South Australia, and the Northern Territory combined.
2. The rates in Figure 5.1.2a have not been adjusted for differences in age structure between the Indigenous and non-Indigenous populations.
3. Data for these figures are available in the online supplementary tables (tables 5.1.2a to 5.1.2b).

Sources: AIHW analysis of the National RHD data collection.

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Measure 5.2: Recurrent acute rheumatic fever

This measure reports on the proportion of all ARF episodes that were recurrent (a reported ARF episode in an individual with a known past ARF episode or with RHD).

Why is it important?

Preventive penicillin treatment in ARF cases aims to treat GAS infections early and therefore, reduce the likelihood of recurrences of ARF and the development of RHD. Effective preventive treatment involves the prolonged use of antibiotics with benzathine penicillin G administered at least every 4 weeks (RHD Australia et al. 2012). Trends in recurrent ARF episodes among people prescribed secondary prophylaxis may be used to monitor the effectiveness of this preventive treatment (AIHW 2019b).

Results: Recurrence of ARF in Queensland, Western Australia, South Australia, and the Northern Territory combined

Overall

- In 2016–2017, 26% of ARF episodes (241 of 920) diagnosed in Indigenous Australians were recurrences, and 17% of ARF episodes for non-Indigenous Australians (11 of 65) were recurrences (Figure 5.2a).

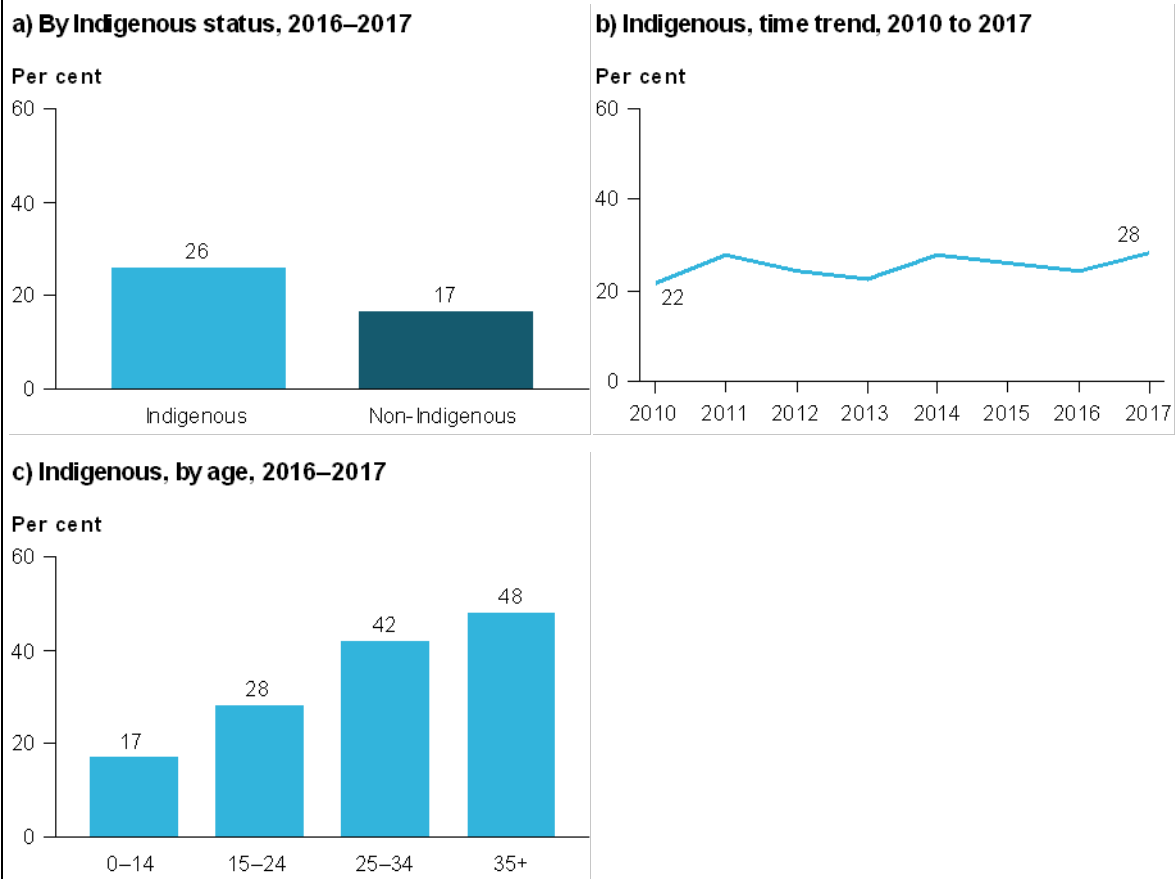
Time trend

- Between 2010 and 2017, the proportion of ARF episodes among Indigenous Australians that were recurrent rose from 22% to 28% (data from South Australia were available from 2013, and were included in this analysis) (Figure 5.2b).

Age

- In 2016–2017, the proportion of ARF episodes that were recurrent rose with increasing age—it was lowest among people aged 14 and under (17%) and highest among those aged 35 and over (48%) (Figure 5.2c).

Figure 5.2: Proportion of ARF episodes that were recurrent, by various characteristics



Notes

1. Data for figures 5.2a and 5.2c are for Queensland, Western Australia, South Australia, and the Northern Territory combined.
2. Data for Figure 5.2b are for Queensland, Western Australia and the Northern Territory for all years, and for South Australia from 2013.
3. Data for these figures are available in the online supplementary tables (tables 5.2a to 5.2c).

Sources: AIHW analysis of the National RHD data collection.

Measure 5.3: Preventive treatment with benzathine penicillin G

This measure presents the number and proportion of required doses of benzathine penicillin G (BPG) given to patients who were prescribed preventive treatment in the previous 12 months. This is known as secondary prevention of RHD.

The number of people prescribed BPG in the previous 12 months differs from that in the previous 2017 report as more stringent inclusion criteria have been used for the analysis. For inclusion in the analysis, people had to be prescribed a schedule of intramuscular BPG every 28 days. They needed to have been prescribed BPG for the entirety of 2017, and to have received at least 1 dose during 2017.

Previous reports reported the number of people prescribed BPG who received less than 50%, 50% to 80%, or greater than 80% of required doses in the previous 12 months. In this report, this has been changed to the number of people prescribed 4-weekly BPG who received less than 50%, 50% to 79%, 80% to 99%, and 100% of required doses in the previous 12 months to highlight the cohort of patients who received all recommended doses. It was assumed that all people in the analysis should have received 13 doses of BPG in the year. Some people may have received more than 13 doses resulting in an adherence of more than 100%.

Why is it important?

For people with a history of ARF or RHD, a program of prolonged use of antibiotics is recommended to prevent recurrent ARF or worsening of RHD (RHD Australia et al. 2012).

The current Australian guidelines state that all people with ARF or RHD should receive BPG every 3–4 weeks, and that treatment should continue for a minimum of 10 years after the most recent episode of ARF, or until the age of 21 (whichever is longer). Some people may require BPG for a longer period, depending on the severity of their RHD and other risk factors. Some people may be prescribed BPG at different frequencies, or alternative antibiotics.

Results: Preventive treatment with benzathine penicillin G in Queensland, Western Australia, South Australia, and the Northern Territory combined

Overall

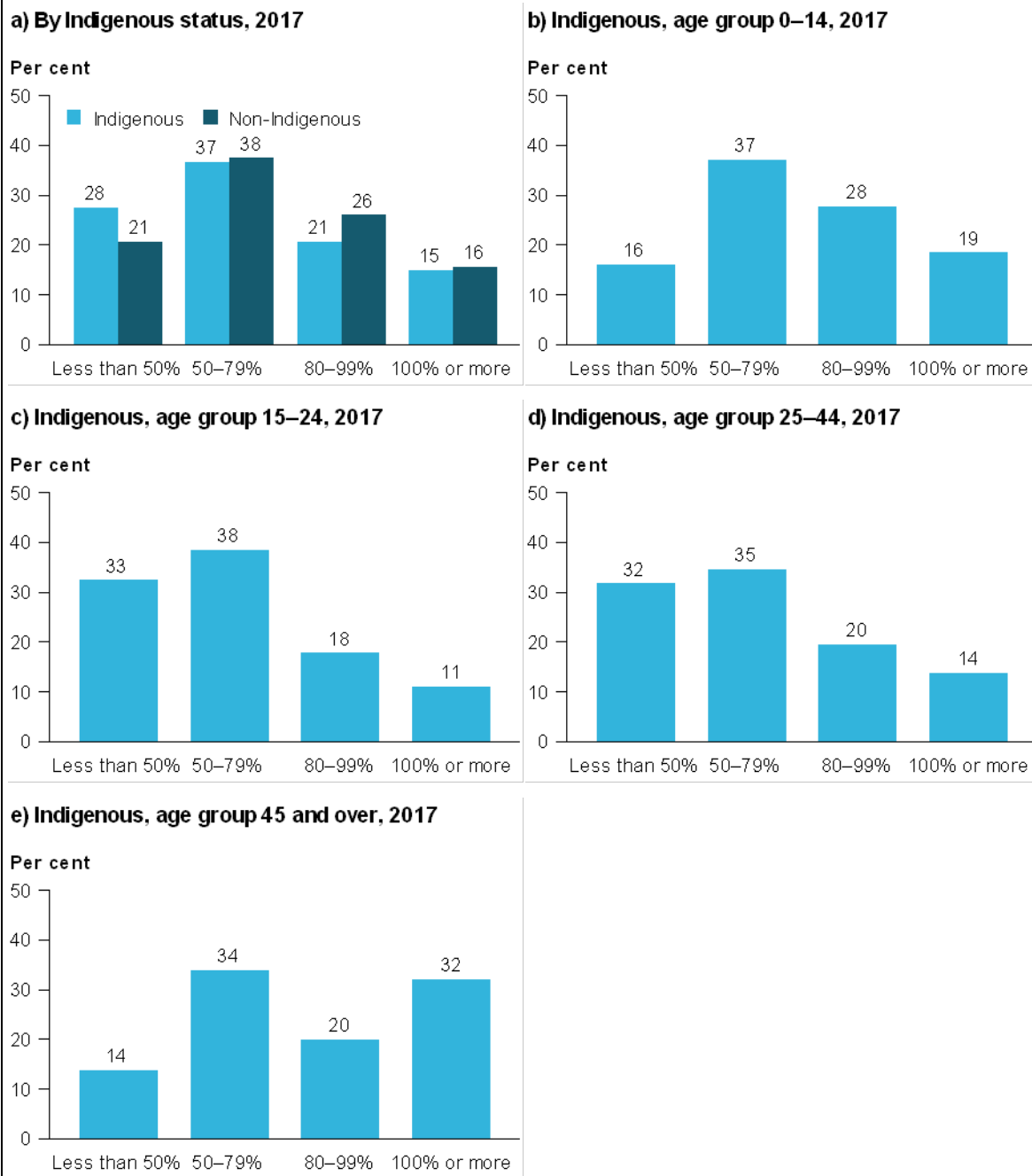
In 2017:

- 2,630 Indigenous Australians were prescribed BPG every 28 days, of whom, in the previous 12 months:
 - 28% received less than 50% of required doses
 - 37% received 50%–79% of required doses
 - 21% received 80%–99% of required doses
 - 15% received 100% or more of required doses (Figure 5.3a)
- 77 non-Indigenous Australians were prescribed BPG. The proportion of non-Indigenous Australians receiving 100% or more of the required BPG doses was similar to that for Indigenous Australians (Figure 5.3a).

Age

- 47% of Indigenous children aged under 15 received at least 80% of their recommended doses (Figure 5.3b).
- Indigenous Australians aged 15–24 and 25–44 had generally lower adherence than other age groups, with almost one-third of people of these ages receiving less than half of their prescribed doses (figures 5.3c and 5.3d).
- 14% of Indigenous Australians aged 25–44 and 32% aged 45 and over completed their required doses (figures 5.3d and 5.3e).

Figure 5.3: Proportion of required BPG doses received, by people prescribed preventive treatment in the previous 12 months



Notes

1. Data for this figure are available in the online supplementary tables (tables 5.3a to 5.3e).
2. Data are from Queensland, Western Australia, South Australia, and the Northern Territory combined.
3. For cases to be included in the analysis, they needed to be prescribed 4-weekly BPG for the entirety of 2017 and have received at least 1 dose in 2017.

Source: AIHW analysis of the National RHD data collection.

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Summary measures: hospitalisation and mortality

As well as the measures relating to the priority areas, 2 summary measures monitor hospitalisations and mortality from cardiac conditions among Aboriginal and Torres Strait Islander people.

The measures are broad indicators of the effectiveness of early risk assessment and preventive care, and provide a population-wide perspective on the impact of cardiac conditions over time.

The measures can be reported using existing data collections (NHMD and National Mortality Database—or NMD).

Hospitalisation results in Measure 6.1 are a count of *hospitalisations* for cardiac conditions and not a count of individuals, as some hospitalisations could represent transfers for ongoing care, or hospitalisations of a single individual at different times during the year.

The full range of diagnosis codes for cardiac conditions were used, as opposed to those for events only. This differs from the approach used for priority area 3 measures, where data on specific cardiac hospitalised events were captured, and hospitalisations ending with transfers were excluded.

Measure 6.1: Hospitalisations for cardiac conditions

This measure presents the rates of hospitalisations for cardiac conditions.

Why is it important?

The hospitalisation rate for cardiac conditions is a broad indicator of the effectiveness of early risk assessment and preventive care.

Results

Overall

Between 2014–15 and 2016–17:

- there were 32,088 Indigenous hospitalisations for cardiac conditions—a crude rate of 14.5 per 1,000 population
- the age-standardised hospitalisation rate of cardiac conditions for Indigenous Australians (26 per 1,000 population) was twice the rate for non-Indigenous Australians (13 per 1,000 population) (Figure 6.1a).

Time trend

- Between 2004–05 and 2016–17, age-standardised hospitalisation rates for cardiac conditions increased slightly for Indigenous Australians (23–26 per 1,000 population) but remained relatively stable for non-Indigenous Australians (14 per 1,000 population) (Figure 6.1b).

Age and sex

In 2016–17, hospitalisation rates for cardiac conditions:

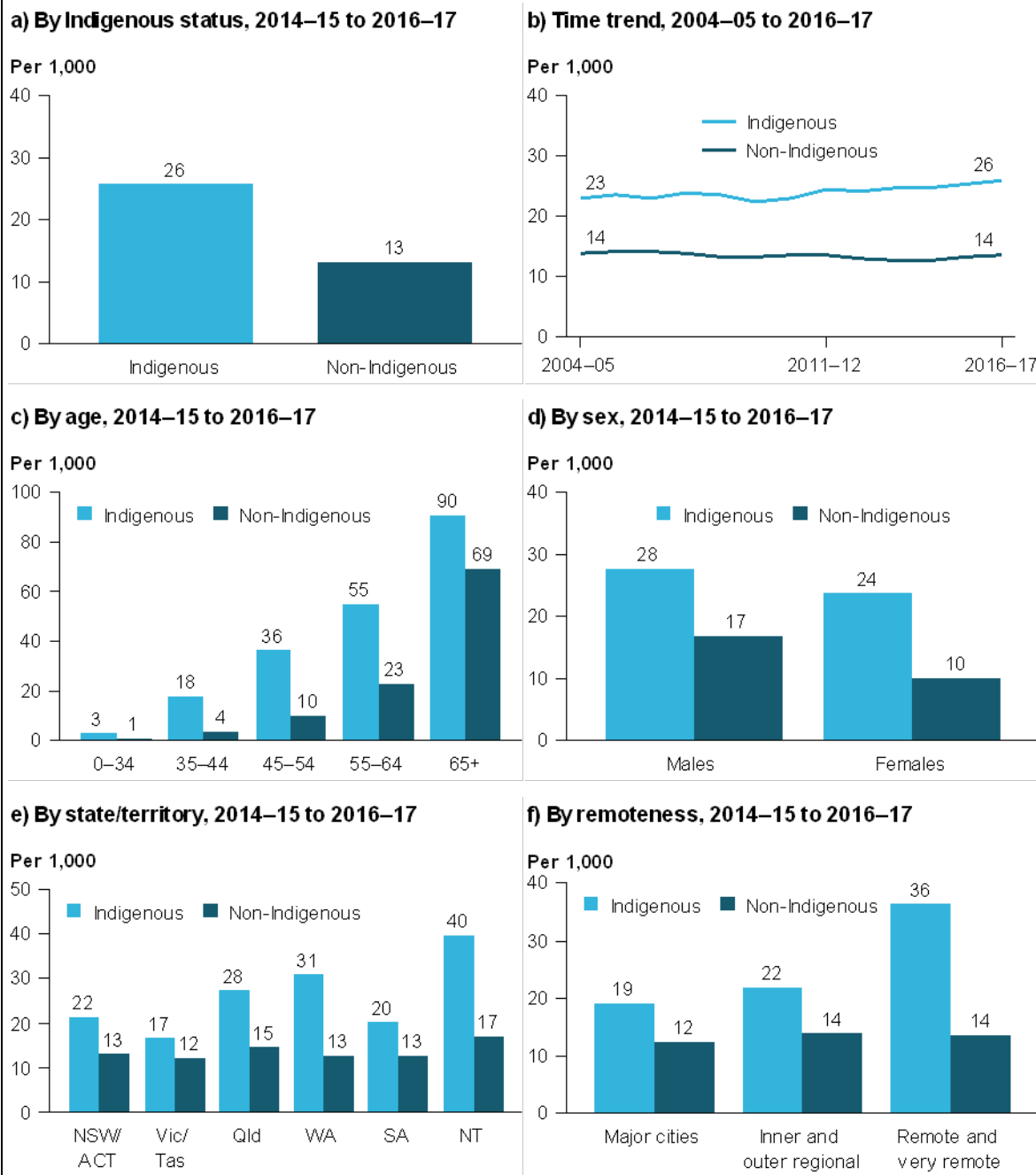
- rose with increasing age for both Indigenous and non-Indigenous Australians, but Indigenous Australians had higher rates of hospitalisation than non-Indigenous Australians, especially among younger age groups (Figure 6.1c)
- were higher for males than females, with a greater difference among non-Indigenous than Indigenous Australians (Figure 6.1d).

State/territory and remoteness area

In 2014–15 to 2016–17, the age-standardised hospitalisation rate for cardiac conditions:

- was highest for Indigenous Australians in the Northern Territory (40 per 1,000 population) and Western Australia (31 per 1,000), where it was more than double that of non-Indigenous Australians (Figure 6.1e)
- was highest for Indigenous Australians in *Remote and very remote* areas combined (36 per 1,000), where it was 2.5 times the rate of non-Indigenous Australians (Figure 6.1f).

Figure 6.1: Age-standardised and age-specific hospitalisation rate for cardiac conditions, by Indigenous status and various characteristics



Notes

1. Data for Figure 6.1b are for New South Wales, Victoria, Queensland, Western Australia, South Australia, and the Northern Territory combined. Data for the other figures are for all jurisdictions.
2. Rates in Figure 6.1c are age specific and therefore not age standardised; all other figures show age-standardised rates.
3. Data for these figures are available in the online supplementary tables (tables 6.1a to 6.1f).
4. There is some under-identification of Indigenous Australians in the NHMD.
5. This is a count of hospitalisations, not of people hospitalised with cardiac conditions, nor of hospitalised cardiac events. Some hospitalisations would not have been associated with diagnoses that represent 'coronary events', and/or they would represent transfers for ongoing care. This should be interpreted in the context of pre- and post-hospital care arrangements.

Source: AIHW NHMD.

Measure 6.2: Deaths due to cardiac conditions

This measure presents the number and age-standardised rate of cardiac mortality and the age-standardised rate of in-hospital mortality for patients admitted with cardiac conditions.

Why is it important?

The mortality rate for cardiac conditions provides a broad indicator of the effectiveness of early risk assessment and preventive care, the timeliness of diagnoses of heart disease and heart failure, and the use of guideline-based treatment.

Results: 6.2.1 Deaths from cardiac conditions

Overall

In 2015–2017, in New South Wales, Queensland, Western Australia, South Australia, and the Northern Territory combined:

- 1,614 Indigenous Australians died from cardiac conditions, or a crude rate of 82 per 100,000 population
- the age-standardised death rate due to cardiac conditions for Indigenous Australians (168 per 100,000 population) was about 1.5 times that for non-Indigenous Australians (107 per 100,000) (Figure 6.2.1a).

Time trend

Between 1998 and 2017:

- the age-standardised cardiac mortality rate fell by almost half (49%) for Indigenous Australians (from 305 to 156 per 100,000 population) and for non-Indigenous Australians (from 199 to 102 per 100,000) (Figure 6.2.1b)
- rate ratios (1.5) of deaths due to cardiac conditions between Indigenous and non-Indigenous Australians were the same between 1998 and 2017
- the rate difference between Indigenous and non-Indigenous Australians fell by half (from 106 in 1998 to 53 in 2017)

Age and sex

In 2015–2017, cardiac mortality rates were:

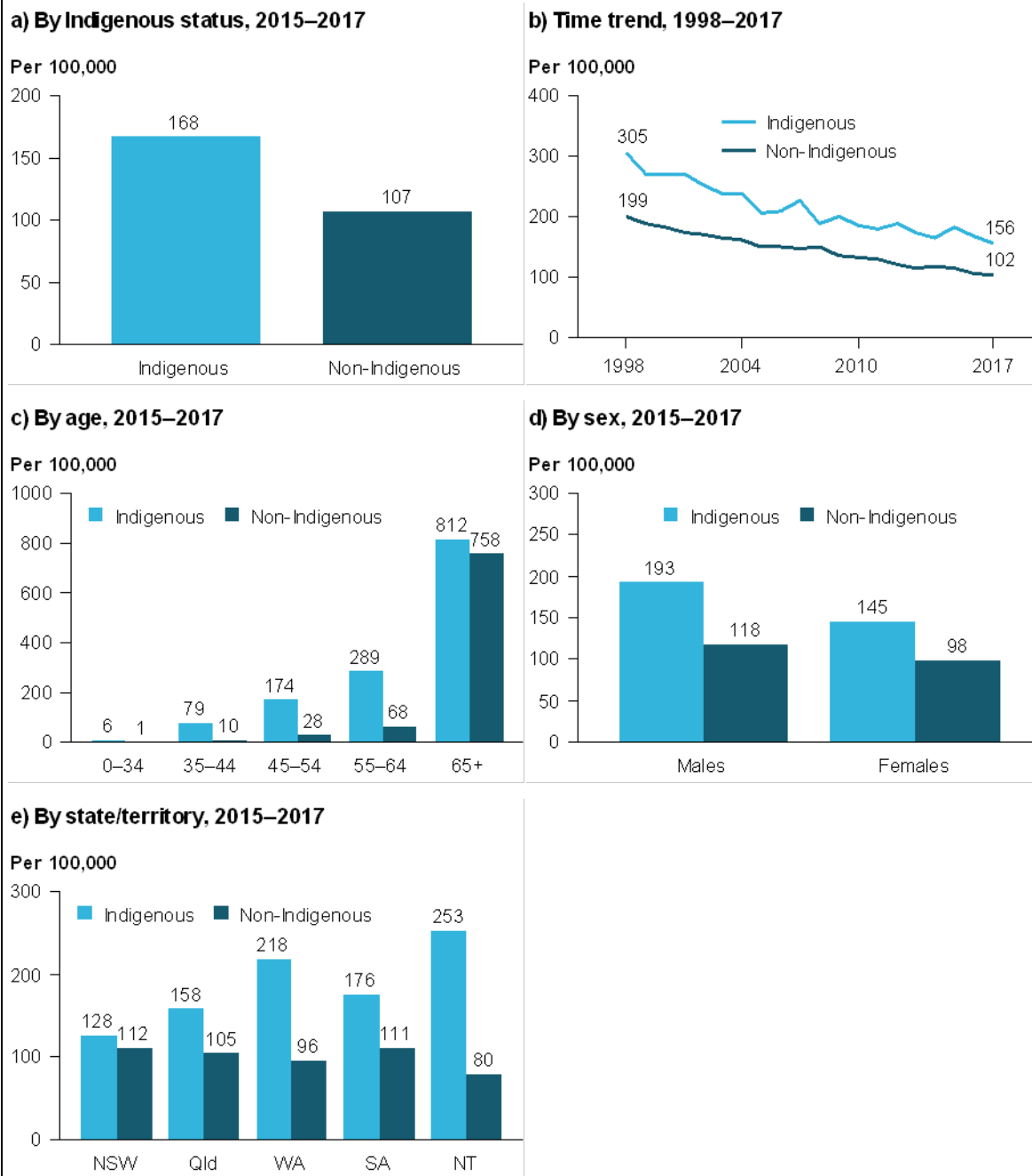
- similar for Indigenous and non-Indigenous Australians aged 65 and over (Figure 6.2.1c)
- higher among Indigenous Australians than non-Indigenous Australians in the other age groups, with rate ratios being most pronounced in those aged 35–44 (almost 8 times as high for Indigenous Australians as for non-Indigenous Australians) (Figure 6.2.1c)
- higher among Indigenous Australians in both sexes, compared with non-Indigenous Australians (Figure 6.2.1d).

State/territory

In 2015–2017, age standardised cardiac mortality rates were:

- highest among Indigenous Australians in the Northern Territory (253 per 100,000 population) followed by Western Australia (218 per 100,000)
- 3 times as high for Indigenous Australians as for non-Indigenous Australians in the Northern Territory (a rate ratio of 3.2), and twice as high in Western Australia (a rate ratio of 2.3) (Figure 6.2.1e).

Figure 6.2.1: Age-standardised and age-specific cardiac mortality rate, by Indigenous status and various characteristics



Notes

1. Data for these figures are for New South Wales, Queensland, Western Australia, South Australia, and the Northern Territory combined.
2. Rates in Figure 6.2.1c are age specific and therefore not age standardised; all other figures show age-standardised rates.
3. Data for these figures are available in the online supplementary tables (tables 6.2.1a to 6.2.1e).
4. Mortality data are reported for 5 jurisdictions only (New South Wales, Queensland, Western Australia, South Australia and the Northern Territory). The other jurisdictions have a small number of Indigenous deaths, and identification of Indigenous deaths in their death registration systems is relatively poor, making data less reliable.

Source: AIHW NMD.

Results: 6.2.2 In-hospital deaths for cardiac-related hospitalisations

Overall

Between 2014–15 and 2016–17:

- 710 Indigenous Australians who were admitted to hospital for cardiac conditions died in hospital—a crude rate of 32 per 100,000 population
- the age-standardised in-hospital death rate for Indigenous Australians admitted for cardiac conditions (64 per 100,000 population) was twice the rate of non-Indigenous Australians (31 per 100,000) (Figure 6.2.2a).

Time trend

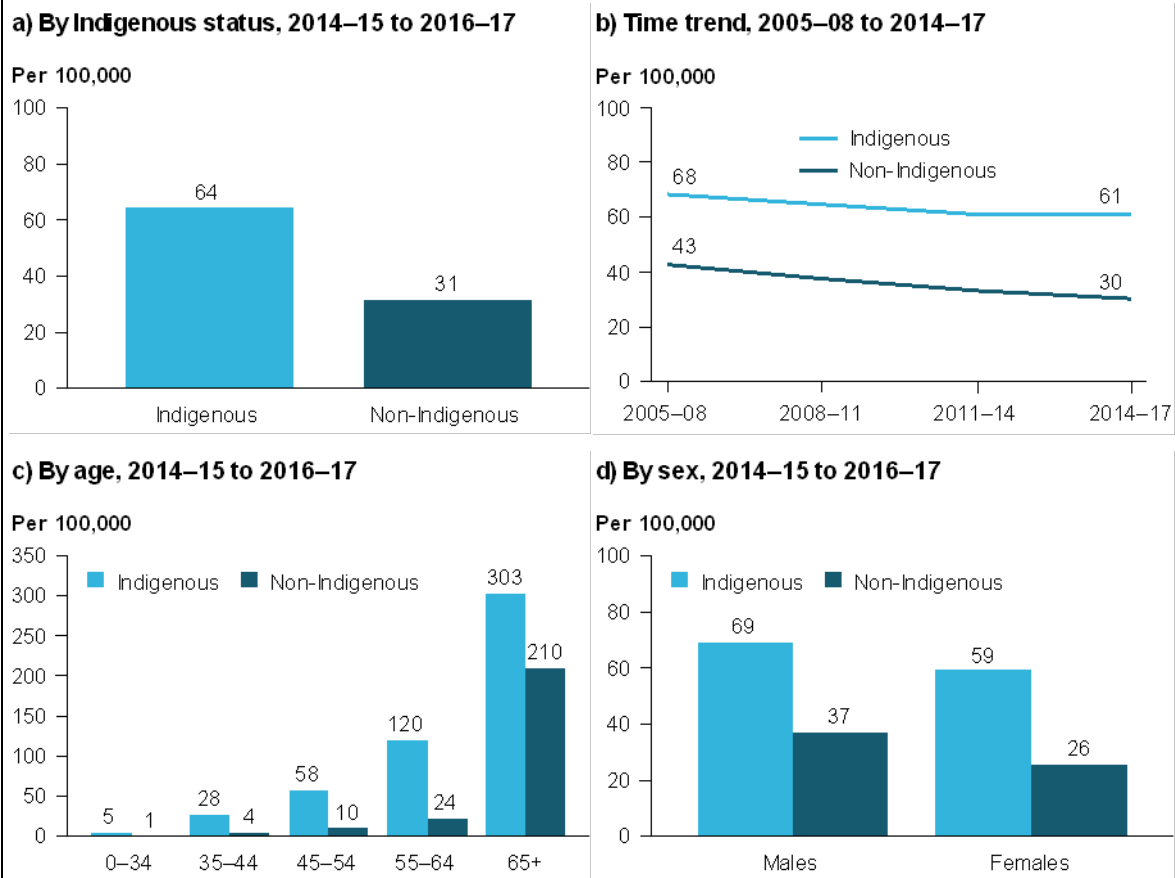
- Between 2005–08 and 2014–17, the age-standardised rate of in-hospital deaths for patients admitted for cardiac conditions fell for both Indigenous Australians (from 68 to 61 per 100,000 population) and non-Indigenous Australians (from 43 to 30 per 100,000) (Figure 6.2.2b).

Age and sex

Between 2014–15 and 2016–17:

- among all age groups, Indigenous Australians had higher crude in-hospital death rates than non-Indigenous Australians (Figure 6.2.2c)
- for both males and females, age-standardised in-hospital death rates for Indigenous Australians were higher than those for non-Indigenous Australians (Figure 6.2.2d).

Figure 6.2.2: Age-standardised and age-specific in-hospital mortality rate for people admitted for cardiac conditions, by Indigenous status and various characteristics



Notes

1. Data for these figures are for New South Wales, Victoria, Queensland, Western Australia, South Australia, and the Northern Territory combined.
2. Rates in Figure 6.2.2 are age specific and therefore not age standardised; all other figures show age-standardised rates.
3. Data for these figures are available in the online supplementary tables (tables 6.2.2a to 6.2.2d).
4. Data by state and territory could not be provided, as they were not comparable due to different practices of recording deaths in the NHMD.
5. In-hospital mortality rates might also be affected by different approaches to pre- and post-hospital care, so should be interpreted in the context of overall cardiac mortality. The NHMD does not include information on cause of death.
6. While the indicator refers to proportions of people, the data presented for this indicator are based on proportions for hospitalisations. Hospitalisations ending in transfer to another acute hospital were excluded, but this still does not take account of multiple hospitalisations of an individual in a single reporting period. As a result, the denominator includes all episodes of hospitalisations for cardiac conditions, including multiple episodes for the same person, while the numerator is a single event associated with 1 of the hospital episodes in the denominator.
7. There is some under-identification of Indigenous Australians in the NHMD.

Source: AIHW NHMD.

Appendix A: Data sources

This appendix provides information on the data sources used in this report, as well as notes about the interpretation of the data to help users understand data issues and limitations.

An important consideration in interpreting data from all collections used in this report is that the propensity of people to identify as being Aboriginal or Torres Strait Islander has changed.

Data from the Australian Bureau of Statistics (ABS) Census of Population and Housing—which were used as the basis for the population estimates used to calculate rates for this report—indicate that the number of Indigenous Australians has increased considerably over the past 2 decades, with a particularly large increase between 2006 and 2011 (ABS 2013).

This increase was beyond what could be expected based on population growth. About 30% of the increase related to non-demographic factors such as improvements in Census coverage, a decrease in the number of records with unknown Indigenous status, and an increased likelihood that individuals identified themselves and their children as Indigenous.

This change in the propensity of people to identify as Indigenous might affect the comparability of data over time, but it is unknown whether, and by how much, changes in Indigenous identification have occurred in the other data sources used in this report.

Medicare Benefits Schedule data

The Medicare Benefits Schedule (MBS) is a listing of Medicare services 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.

All Australian residents and certain categories of visitor to Australia are entitled to benefits for medical and hospital services, with the benefits being 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 analysed by the AIHW via the Health Portfolio Enterprise Data Warehouse of the Department of Health. The data are based on the date claims were processed. Statistics can be compiled by period of service; however, MBS weighted Indigenous data are based only on period of processing.

The MBS data presented in this report for measures 4.2 and 4.3 were provided by the Department of Health, with further analysis of those data done by the AIHW (for example, deriving rates).

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 health care provided.

Coverage of MBS data

MBS data reflect services subsidised under Medicare. A person may be provided with equivalent care from a health-care provider who is not eligible to bill Medicare. Legislation (specifically Section 19(2) of the *Health Insurance Act 1973*) prevents salaried health providers funded by government from claiming payments from Medicare (Health Insurance Act 1973), including federal, state and local governments and authorities established by a law of the Commonwealth or a state or territory. This is to ensure that the government pays only once for each health-care service provided. Examples of entities that are ordinarily not eligible to claim under Medicare include state or territory-funded primary health-care services and public hospitals.

Some of these organisations can apply for a Section 19(2) exemption to allow them to claim Medicare payments. For example, some services in rural and remote areas that are funded by state or territory governments can apply for an exemption if they meet eligibility criteria (such as the community's having a small population and a GP shortage).

Demographic information

Information about all people currently enrolled in Medicare (and eligible to receive services) is contained in the Medicare Enrolment File held by the Department of Human Services, the administrator of the Medicare program. Information from the enrolment file (including patient demographic information) is reflected in the MBS data held by the Department of Health. This information is updated from time to time to correct errors and record changing mail addresses.

Indigenous identification

The identification of Indigenous Australians in MBS data are not complete. Since 2002, people who identify as being of Aboriginal and/or Torres Strait Islander descent have been able to have this information recorded on the Medicare Enrolment File through the Voluntary Indigenous Identifier. Enrolment is through either an 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 Voluntary Indigenous Identifier process. Coverage varies by age group and state and territory (Table A1).

Table A1: Estimated proportion of Indigenous Australians enrolled through the Voluntary Indigenous Identifier, March 2016 (%)

Age group (years)	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total
0–4	92.2	80.6	92.0	100.0	86.4	76.6	78.8	95.6	91.6
5–14	54.8	54.8	74.3	78.2	65.0	56.1	62.2	83.9	67.0
15–54	47.7	56.4	66.0	69.8	54.7	45.0	43.7	65.0	58.5
55 and over	48.5	79.4	65.9	67.5	67.2	47.1	63.4	72.3	60.9
Total	54.7	61.3	71.2	74.8	61.9	51.4	52.7	72.7	64.6

Note: The population data used in calculating these proportions are projections for 30 June 2015, and based on 2011 Census data.

Source: Department of Health analysis of MBS and ABS Indigenous population data.

The MBS data presented in this report have been adjusted for under-identification, except for data about MBS item 715 health assessments (Measure 1.1). 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.

For the other MBS data (on services that can be claimed irrespective of the Indigenous status of the individual), information from the Voluntary Indigenous Identifier is used.

As not all Indigenous Australians are enrolled on the Voluntary Indigenous Identifier, the relevant MBS data were scaled up by the Department of Health to reflect the size of the total Indigenous population.

Adjustment factors were developed by comparing the number of people enrolled on the Voluntary Indigenous Identifier with the estimated Indigenous resident population at selected levels of demographic and geographic disaggregation (namely, data by 5-year age groups up to age 65 and over, sex, and remoteness area for each state or territory).

The adjustment factors for each subgroup were calculated as follows:

$$\text{Adjustment factor} = 100/\text{estimated percentage of Indigenous population enrolled on the Voluntary Indigenous Identifier.}$$

To derive the estimates of MBS service use among Indigenous Australians, the number of Voluntary Indigenous Identifier enrollees in each subgroup for whom the MBS item(s) of interest were claimed was multiplied by the adjustment factor for each subgroup.

Estimates for non-Indigenous Australians were derived by subtracting the adjusted Indigenous estimates from the total number of people for whom the relevant MBS items were claimed.

Health assessments for Indigenous and non-Indigenous Australians

Data about the receipt of health assessments among Indigenous and non-Indigenous Australians are not comparable due to differences in eligibility for the various types of health assessments, and the frequency with which they can be claimed.

All Aboriginal and Torres Strait Islander people, regardless of age, are eligible for an MBS item 715 Indigenous-specific health assessment. These assessments are generally available annually, with a minimum time allowed between them of 9 months.

There are 4 time-based MBS health assessment items: items 701 (brief), 703 (standard), 705 (long) and 707 (prolonged). Medical practitioners may select 1 of these items to provide a health assessment service to a member of any of the target groups listed in Table A2. The item selected depends on the time taken to complete the health assessment (and is unrelated to the target group). Collectively, these items are referred to as 'general health assessments' in this report. All Australians (including non-Indigenous and Indigenous Australians) are eligible to receive such assessments, but only if they meet specific criteria. These assessments are often available less often than the Indigenous-specific health assessment (Table A2).

Table A2: Target group and frequency of service for other (non-MBS 715) MBS health assessments

Target group	Frequency of service
A type 2 diabetes risk evaluation for people aged 40–49 (inclusive) with a high risk of developing type 2 diabetes, as determined by the Australian Type 2 Diabetes Risk Assessment Tool	Once every 3 years to an eligible patient
A health assessment for people aged 45–49 (inclusive) who are at risk of developing chronic disease	Once only per lifetime to an eligible patient
A health assessment for people aged 75 and over	Annually to an eligible patient
A comprehensive medical assessment for permanent residents of residential aged care facilities	Annually to an eligible patient
A health assessment for people with an intellectual disability	Annually to an eligible patient
A health assessment for refugees and other humanitarian entrants	Once only per lifetime to an eligible patient
A health assessment for former serving members of the Australian Defence Force	Once only per lifetime to an eligible patient

Estimate of people with a cardiac condition from MBS data

Since MBS data do not include information about whether people have a cardiac condition, this estimate was based on people who had claimed 1 or more of the cardiac-related MBS items in the relevant financial year (Table B2). As some of these MBS items are diagnostic, not all people with these items would have cardiac conditions (as some of the tests would have been negative).

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. The NHMD holds data on admitted patient separations between 1 July and 30 June of each reference year.

Hospitalisations with a care type of *Newborn (without qualified days)* and records for *Hospital boarders* and *Posthumous organ procurement* were excluded from the analyses for all measures based on NHMD data. Further exclusions and inclusions apply to the analyses for some of the measures, with details provided in the relevant sections of the report.

The principal diagnosis is reported for each hospitalisation, and recorded in the NHMD, with additional diagnoses reported if the condition affected patient management. In this report, information on principal diagnoses was used to identify hospitalisations for specific conditions; additional diagnoses have not been considered.

NHMD data presented by state/territory and remoteness area in this report are based on the patient's usual place of residence. In analysing data by state and territory, 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, with prior years classified according to the Australian Standard Geographical Classification. The time trend analyses of hospitalisations data in Measure 3.5 uses combined data across years spanning this change.

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 in 2011–12 found that the 'true' number of hospitalisations nationally for Indigenous Australians was about 9% higher than reported (AIHW 2013). NHMD data presented in this report have not been adjusted for under-identification, so are likely to underestimate the true level of Indigenous hospitalisations.

Some analyses in this report include NHMD data for years before 2010–11 (analyses for measures 3.5 and 6.2.2, as well as the time series comparisons for the other measures based on NHMD data). Those analyses are limited to data for the 6 jurisdictions assessed by the AIHW as having adequate identification of Indigenous Australians from 2004–05 onwards (New South Wales, Victoria, Queensland, Western Australia, South Australia and public hospitals in the Northern Territory) (AIHW 2010). These 6 jurisdictions represent about 95% of the Australian Indigenous population (AIHW 2015c).

Changes in the level of accuracy of Indigenous identification in hospital records will result in changes in the level of reported 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.

A rise in hospitalisation rates for a particular population might also reflect increased use of admitted patient hospital services—as opposed to other forms of health care—rather than a worsening of health. Likewise, a fall in hospitalisation rates might not necessarily indicate an improvement in health.

Apart from data from hospitals in Western Australia, hospitalisations where the person's Indigenous status was not stated were excluded from analyses comparing 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.

Estimation of hospitalised episodes for priority area 3 measures

To reduce double-counting of people with an ACS who were transferred to another hospital for further diagnosis or treatment, the analyses for priority area 3 (guideline-based therapy for ACS) measures exclude hospitalisations ending in transfer to another acute hospital. So, only the 'last' hospitalisation for each event of an ACS is generally counted.

While this method reduces double-counting of patients within a contiguous hospitalisation, it purposefully includes non-contiguous hospitalisations. For example, if a person had 2 STEMI events in 1 year, both would be counted.

This method was validated in calculating the incidence of acute coronary events when the AIHW compared results from the NHMD and the NMD with results from linked hospitalisation and deaths data from New South Wales and Western Australia (AIHW 2014).

The following limitations were noted as part of these analyses:

- Some hospitalisations ending in transfer did not have a subsequent hospitalisation recorded; some of these patients, for example, could have been transferred interstate.
- Some hospitalisations did not have a principal diagnosis of AMI or unstable angina. In Western Australia, the most common principal diagnosis in the subsequent hospitalisation was rehabilitation, while in New South Wales it was atherosclerotic heart disease. It is also possible that the transfer was initiated for what was thought to be ACS, but subsequently was not confirmed.

Further, the validity of this method has not been established for calculating procedures rates. A notable limitation is that, among those events that involved multiple hospitalisations, if a relevant procedure was provided in an earlier hospitalisation, but not in the last hospitalisation, that event will not be counted as having included that procedure.

As well, if a patient is transferred to another acute hospital for recovery following a procedure in the first hospitalisation, and admitted on a non-emergency basis in their last hospitalisation, that event would be excluded from the AIHW analysis. This is because hospitalisations ending in transfer to another acute hospital are excluded, with the analysis being restricted to hospitalisations with an urgency of admission of 'emergency'.

For in-hospital mortality (Measure 3.5), the linked analysis suggested that the AIHW method using unlinked data might be missing some events that did not end with death, thereby artificially inflating the in-hospital mortality rate.

It is not known to what extent these findings, which are based on New South Wales data, are applicable to other states and territories.

State/territory comparisons for priority area 3 measures

Previous AIHW analysis has shown that transfer rates for ACS vary by state and territory—in 2010–11, the transfer rate for non-fatal ACS hospitalisations among people aged 40 and over ranged from 13% in Tasmania to 33% in the Northern Territory (AIHW 2014).

These differences at least partly reflect differences in population size and geographical distribution. For example, people with ACS in remote areas are more likely to be transferred from a smaller hospital to larger, more urban hospitals for treatment.

Because of these differences in inter-hospital transfer rates across states and territories, interpreting differences in jurisdictional data for measures 3.1 and 3.3 must be done with caution; hence, those data were not included in Chapter 2. But results by state and territory are shown in Table A3 to provide jurisdictions with their own state or territory data.

As well as the issue of transfers, data for Measure 3.5 are also affected by different practices of recording deaths in admitted patient data. Some jurisdictions record deaths in emergency departments as in-hospital deaths for admitted patients, while others do not. As a result, data for Measure 3.5 are not comparable by state and territory, and are not included in this report.

Table A3: Results for measures 3.1 and 3.3, by state/territory, 2014–15 to 2016–17

State/territory	Measure 3.1 ^(a) (%)			Measure 3.3 ^(b) (%)		
	Indigenous crude rate	Age-standardised rate		Indigenous crude rate	Age-standardised rate	
		Indigenous	Non-Indigenous ^(c)		Indigenous	Non-Indigenous ^(c)
NSW/ACT	66.2	59.5	75.1	51.5	50.3	64.1
Vic/Tas	73.0	68.5	80.1	56.8	63.4	71.4
Qld	65.6	67.5	71.8	49.3	51.1	57.2
WA	70.7	77.8	83.5	61.1	64.3	76.9
SA	75.0	79.0	72.6	54.7	56.4	77.7
NT	44.7	45.1	60.0	52.7	50.4	63.7

(a) The proportion of hospitalised events for STEMI among people aged 18 and over that were treated by PCI.

(b) The proportion of hospitalised events for ACS among people aged 18 and over that included diagnostic angiography and/or a definitive revascularisation procedure (PCI or CABG).

(c) 'Non-Indigenous' includes hospitalisations of non-Indigenous Australians only, except for data from Western Australia, which include those for whom Indigenous status was not stated.

Notes

1. Data are for people aged 18 and over who usually live in New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania, the Australian Capital Territory or the Northern Territory. ACT data contained in this report have been validated as at the date of extraction; however, ACT Health is continuing to improve its data quality following its system-wide data review.
2. Analysis is restricted to hospitalisations with a care type of 'acute care' and an urgency of admission of 'emergency'.
3. Analysis excludes hospitalisations with a separation mode of 'transferred to another acute hospital'.
4. Analysis is based on principal diagnosis only.
5. See tables B1, B3, and B4 for classification codes used for these measures.

Source: AIHW NHMD.

National Key Performance Indicators data collection

The nKPIs measure the health of Aboriginal and Torres Strait Islander people from across Australia.

The population of interest in the nKPIs is the Indigenous regular client population of those primary health-care organisations required to report against the nKPIs. A regular client is defined as a person who has an active medical record—that is, a client who attended the primary health-care organisation at least 3 times in the last 2 years. Starting from the June 2018 collection, the definition of a regular client excludes deceased patients. These are some caveats to note:

- Some clients may attend an organisation 3 times in 2 years but have another primary health-care organisation as their primary source of care. This will lead to double-counting of that person.
- Some clients may be the normal clients of an organisation but have not attended 3 times in a 2-year period for a number of reasons, including that the client could be in good health. Hence, the nKPI data may be biased towards less healthy clients, as people who are unwell are more likely to attend primary health-care organisations.
- There may be variations in the make-up of regular clients between regions as clients may access different health-care organisations within the same general location for various reasons. This behaviour may be more common in regions with more health-care options and less frequent in *Very remote* areas where local health-care options are more limited.
- Some clients may be transient and stay only temporarily in a community. Organisations with a large proportion of transient clients that are counted as regular clients may appear to have poorer results than other organisations, as they may have less capacity to follow-up on patients, including those with chronic diseases.

In the June 2018 reporting period, data were collected from 233 primary health-care organisations that receive funding from the Department of Health to provide primary health-care services, mainly to Aboriginal and Torres Strait Islander people.

Altogether 24 nKPIs have received approval and endorsement for reporting. The indicators focus on maternal and child health, preventive health and chronic disease management. Reporting against all 24 indicators began in June 2017.

Absolute cardiovascular risk assessments can be calculated using the National Vascular Disease Prevention Alliance (NVDPA) or the Central Australian Rural Practitioners Association (CARPA) method. As the CARPA method applies an extra 5% loading for Indigenous Australians, nKPI data should have this loading removed to make the data comparable with NVDPA data. As the Primary Care Information System (PCIS) is unable to deduct the 5% loading because the data are captured as categorical scores (low, medium, high), organisations using the PCIS (predominantly the Northern Territory Government) are not included in the results presented (AIHW 2019a).

National Mortality Database

Mortality data are extracted from the AIHW NMD. The AIHW NMD contains information about all deaths registered in Australia since 1964. Deaths are certified by a medical practitioner or the coroner and registered by the Registry of Births, Deaths and Marriages in each state and territory. The ABS codes the cause of death, using international classification standards (currently the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, or ICD-10 for short). Information from the National Coronial Information System is used to code the cause of death for those deaths certified by a coroner. The data are maintained by the AIHW in the NMD.

Due to the relatively small number of Indigenous deaths from cardiac conditions each year, mortality data for the most recent period are presented for the 3-year period 2015–2017 to allow for the reporting of data by age and sex.

For analyses in this report, deaths before 2007 are by year of registration. Deaths from 2007 onwards are by reference year. Registration year before 2007 is equivalent to reference year from 2007 onwards.

For this report, data on deaths registered in:

- 2014 and earlier are based on the final version of cause of death data
- 2015 are based on a revised version, and are subject to further revision by the ABS
- 2016 and 2017 are based on preliminary versions, and are subject to further revision by the ABS.

Data for 2010 have been adjusted for the additional deaths arising from outstanding registrations of deaths in Queensland in 2010 (see Technical note 3 in ABS 2012 for further details).

The NMD includes information about both the underlying and associated causes of death—only the underlying causes were used for this report.

The data quality statements underpinning the NMD can be found in quality declaration summaries at www.abs.gov.au/ausstats/abs@.nsf/mf/3303.0 and www.abs.gov.au/ausstats/abs@.nsf/mf/3302.0.

For more information on the AIHW NMD, see Deaths data at AIHW <https://www.aihw.gov.au/about-our-data/our-data-collections/national-mortality-database>.

Indigenous identification

The Indigenous status of a deceased person is identified through the death registration process. There is some degree of under-identification of Indigenous Australians in mortality data as some deceased Indigenous Australians are not reported as Indigenous by the family, health worker or funeral director during the death registration process.

Mortality data presented in this report have not been adjusted for under-identification, so are likely to underestimate the true level of Indigenous mortality (ABS 2015).

In this report, mortality data are reported for 5 jurisdictions—New South Wales, Queensland, Western Australia, South Australia and the Northern Territory—based on the state or territory of usual residence.

Although the identification of Indigenous Australians in deaths data is incomplete to varying degrees in all state and territory registration systems, these 5 jurisdictions have been assessed by the ABS and the AIHW as having adequate identification.

The AIHW considers the quality of Indigenous identification in mortality data for the 5 jurisdictions to be adequate from 1998, so trend data are shown in this report from that year onwards. Registered deaths where Indigenous status was not stated were excluded for the analyses in this report.

National Rheumatic Heart Disease data collection

Under the Rheumatic Fever Strategy, the Australian Government provides funding to support RHD control programs in 4 jurisdictions: Queensland, Western Australia, South Australia and the Northern Territory. These programs:

- identify people with or at risk of ARF and RHD
- promote the primary prevention of ARF
- support the delivery of long-term secondary prevention treatment
- increase awareness of ARF and RHD among health professionals, and educate health professionals, patients (and their families) and communities about these diseases
- maintain disease registers for people diagnosed with ARF or RHD, and use this information to monitor health outcomes and improve control program activities.

In Queensland, Western Australia, South Australia and the Northern Territory, the collection of ARF/RHD registrations is funded by the Department of Health. A state-funded ARF/RHD register has recently started in New South Wales, but data are not available for this report. Data about ARF and RHD diagnoses are not collected by jurisdictional health departments in the Australian Capital Territory, Victoria or Tasmania.

The current Northern Territory RHD register has been collecting data since 1997. (It includes information from a prior collection that was active before 1997.) South Australia began in 2012, the Queensland register in 2009 and the Western Australian register in 2009. The Queensland register incorporates information from 1999 onwards, when ARF became notifiable. All 4 states with RHD registers have different practices for notification and data collection and therefore the numbers, data quality and completion in the RHD registers are variable.

The registers include demographic and clinical information about people with ARF and RHD. Records are made of the first known ARF episode and recurrent episodes, and diagnoses are classified as being either confirmed or possible. Data are collected about diagnoses, preventive treatment and episode type, level of confirmation, level of severity, preventive treatments and when monitoring activities or surgery are performed.

Data are accurate at the time of collection but are subject to change over time if more or different information is provided about cases. In particular, in South Australia, RHD cases recorded on the register are for people aged under 50, except when they are from a high-risk population group. For some jurisdictions, consent must be sought from a patient before they are included in the register. Due to the long-term nature of RHD, even demographic details, such as place of diagnosis, can change multiple times.

The National RHD data collection, held by the AIHW, contains data on diagnoses of ARF and RHD in Australia. It is a collation of data from ARF/RHD clinical registers held by the 4 jurisdictions in which ARF and/or RHD are notifiable diseases. Information from the AFR/RHD registers in these jurisdictions are compiled by the AIHW to provide information about ARF and RHD in Australia (AIHW 2019).

For the time time, data for this report were sourced directly from the National RHD data collection, with analysis performed in house at the AIHW. All rates of ARF shown in this report are crude, as the necessary data to calculate age-standardised rates are not available due to small numbers, particularly for non-Indigenous Australians.

Indigenous population

The size of the Indigenous population varies substantially by state and territory. To provide context for the state and territory data shown in this report, population estimates for 2017 are shown in Table A4.

In 2017, the Indigenous population ranged from 7,300 in the Australian Capital Territory to about 235,000 in New South Wales.

The proportion of the population who are Indigenous also varies by state and territory. In 2017, it ranged from less than 1% in Victoria to 31% in the Northern Territory (Table A4).

Table A4: Australian population, by Indigenous status and state/territory, 2017

State/territory	Indigenous ^(a)	Non-Indigenous ^(b)	Total	% Indigenous
NSW	234,699	7,626,369	7,861,068	3.0
Vic	55,073	6,268,533	6,323,606	0.9
Qld	218,448	4,710,009	4,928,457	4.4
WA	99,697	2,480,657	2,580,354	3.9
SA	42,406	1,681,142	1,723,548	2.5
Tas	27,682	493,195	520,877	5.3
ACT	7,310	402,991	410,301	1.8
NT	75,692	170,413	246,105	30.8
Australia^(c)	761,300	23,837,633	24,598,933	3.1

(a) Population counts for Indigenous Australians are projections based on ABS medium-level growth assumptions (Series B).

(b) Population counts for non-Indigenous Australians were derived by subtracting the Indigenous projected population counts from the total Australian estimated resident population counts.

(c) Australia total includes Christmas Island, Norfolk Island, and Cocos (Keeling) Islands.

Note: Estimates and projections are based on 2011 Census data.

Sources: AIHW analysis of ABS 2014, 2015.

Appendix B: Technical specifications

Table B1: Technical specifications for Better Cardiac Care measures in this report

No.	Description	Calculation	Numerator	Denominator	Data sources
1.1	Proportion of Indigenous Australians who received an MBS health assessment within a 12-month period.	Crude rate: Numerator ÷ Denominator x 100 Age-standardised rates (ASR) ^(a) was used in figure 1.1a.	Number of people who had an MBS Health Assessment billed to the MBS within the financial year.	Population at the middle of the financial year, calculated from the average of the populations as at 30 June at the beginning and end of the financial year.	MBS and ABS population data
1.2	Proportion of Indigenous regular clients of Indigenous primary health-care organisations, aged 35–74 and with no known history of CVD, who have had an absolute CVD risk assessment recorded within the previous 24 months and whose CVD risk was categorised as high, moderate, or low.	Crude rate: Numerator ÷ Denominator x 100	Number of Indigenous regular clients, aged 35–74 years and with no known history of CVD, who have had an absolute CVD risk assessment recorded within the previous 24 months with risk assessed as 1) high(greater than 15% chance of a cardiovascular events in the next 5 years); 2) moderate (10-15% chance of a cardiovascular event in the next 5 years); low (less than 10% chance of a cardiovascular event in the next 5 years)	Number of Indigenous regular clients, aged 35–74 years, not recorded as having CVD and who have had an absolute CVD risk assessment results recorded within the previous 24 months	nKPI
2.1	Proportion of people who had relevant Medicare-listed cardiac-related diagnostic items claimed in the previous 12 months.	Crude rate: Numerator ÷ Denominator x 100 ASR was used in figures 2.1a, 2.1b, 2.1d, 2.1e and 2.1f.	Number of people who had relevant Medicare-listed cardiac-related diagnostic or imaging items (as listed in Table B2) claimed in the financial year.	Population at the middle of the financial year, calculated from the average of the populations as at 30 June at the beginning and end of the financial year.	MBS and ABS population data
2.3	Number and proportion of people with suspected or confirmed cardiac disease reviewed by a cardiologist in the previous 12 months.	Crude rate: Numerator ÷ Denominator x 100 ASR was used in figure 2.3b	Number of people who received relevant Medicare-listed cardiac-related diagnostic or therapeutic item (as listed in Table B2) who also received specialist review items (as listed in Table B2) claimed in the financial year.	Number of people who had relevant Medicare-listed cardiac-related diagnostic or therapeutic items (as listed in Table B2) claimed in the financial year.	MBS data
3.1	Proportion of hospitalised events for STEMI among people aged 18 and over who were treated by PCI within the period of care ^(b) .	Crude rate: Numerator ÷ Denominator x 100 ASR was used in figures 3.1a, 3.1b, 3.1d and 3.1e.	Number of hospitalisations with a principal diagnosis of STEMI (as listed in Table B4), a care type of 'acute care', urgency of admission of 'emergency', and a separation mode of 'not transferred to another acute hospital', with a procedure code related to PCI (as listed in Table B3).	Number of hospitalisations with a principal diagnosis of STEMI (as listed in Table B4), a care type of 'acute care', urgency of admission of 'emergency', and a separation mode not equal to 'transferred to another acute hospital'.	NHMD

(continued)

Table B1 (continued): Technical specifications for Better Cardiac Care measures in this report

No.	Description	Calculation	Numerator	Denominator	Data sources
3.3	Proportion of hospitalised events for acute coronary syndrome among people aged 18 and over that included diagnostic angiography and/or a definitive revascularisation procedure (PCI or CABG) within the period of care ^(b) .	Crude rate: Numerator ÷ Denominator x 100 ASR was used in figures 3.3a, 3.3b, 3.3d and 3.3e.	Number of hospitalisations with a principal diagnosis of STEMI, non-ST-segment-elevation ACS, unspecified AMI, or unstable angina (as listed in Table B4), a care type of 'acute care', urgency of admission of 'emergency', and a separation mode not equal to 'transferred to another acute hospital', with a procedure code related to diagnostic angiography or PCI or CABG (as listed in Table B3).	Number of hospitalisations with a principal diagnosis of STEMI, non-ST-segment-elevation ACS, unspecified AMI or unstable angina (as listed in Table B4), a care type of 'acute care', urgency of admission of 'emergency' and a separation mode not equal to 'transferred to another acute hospital'.	NHMD
3.5	Proportion of people aged 35 and over, admitted to hospital with a principal diagnosis of acute myocardial infarction who died in hospital, by Indigenous status.	Crude rate: Numerator ÷ Denominator x 100 ASR was used in figures 3.5a, 3.5b, 3.5d and 3.5e.	Number of hospitalisations with a principal diagnosis of AMI (as listed in Table B4), a care type of 'acute care', urgency of admission of 'emergency' and a separation mode of 'died'.	Number of hospitalisations with a principal diagnosis of AMI (as listed in Table B4), a care type of 'acute care', urgency of admission of 'emergency', and a separation mode not equal to 'transferred to another acute hospital'.	NHMD
4.2	Number and proportion of patients with a cardiac condition who received a follow-up service within 12 months of having a cardiac procedure.	Crude rate: Numerator ÷ Denominator x 100	Number of people who had relevant Medicare-listed cardiac-related therapeutic items (as listed in Table B2) claimed in the financial year, and received Medicare-listed follow-up services including a GP management plan, team care arrangement, allied health service, practice nurse monitoring and support, review of a GP management plan and team care arrangement, and contribution to a multidisciplinary care plan within 12 months (as listed in Table B2).	Number of people who had relevant Medicare-listed cardiac-related therapeutic items (as listed in Table B2) claimed in the financial year.	MBS
4.3	Number and proportion of patients with a cardiac condition who were reviewed by a specialist physician within 12 months of having a cardiac procedure.	Crude rate: Numerator ÷ Denominator x 100	Number of people who had relevant Medicare-listed cardiac-related therapeutic items (as listed in Table B2) claimed in the financial year, and received a Medicare-listed specialist review (as listed in Table B2) within 12 months.	Number of people who had relevant Medicare-listed cardiac-related therapeutic items (as listed in Table B2) claimed in the financial year	MBS
5.1	(i) Incidence (first known and recurrent) of acute rheumatic fever. (ii) New diagnoses of rheumatic heart disease, by Indigenous status.	Crude rates: Numerator ÷ Denominator x 100,000	(i) Number of first known and recurrent episodes of ARF in the calendar year. (ii) Number of new diagnoses of RHD in the calendar year.	Population as at 30 June.	National RHD data collection; ABS population data

(continued)

Table B1 (continued): Technical specifications for Better Cardiac Care measures in this report

No.	Description	Calculation	Numerator	Denominator	Data sources
5.2	Proportion of all acute rheumatic fever episodes that were recurrent.	Crude rates: Numerator ÷ Denominator x 100	Number of recurrent cases for ARF in the calendar year.	Number of new and recurrent cases of ARF in the calendar year.	National RHD data collection
5.3	Percentage of required doses of benzathine penicillin G received in the previous 12 months among people on an ARF/RHD program.	Crude rates: Numerator ÷ Denominator x 100	Number of people on the ARF/RHD program who received less than 50%, 50% to 79%, 80% to 99% or 100% of required doses in the previous 12 months.	Number of people on the ARF/RHD program.	National RHD data collection
6.1	Cardiac morbidity— rates of hospitalisation for a cardiac condition.	Crude rate: Numerator ÷ Denominator x 1,000 ASR was used in figures 6.1a, 6.1b, 6.1d, 6.1e and 6.1f.	Number of hospitalisations with a principal diagnosis of cardiac condition, and a care type not equal to 'newborn—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 as at 30 June at the beginning and end of the financial year.	NHMD and ABS population data
6.2.1	Cardiac mortality— rates of cardiac mortality.	Crude rate: Numerator ÷ Denominator x100,000 ASR was used in figures 6.2.1a, 6.2.1b, 6.2.1d and 6.2.1e.	Number of deaths where a cardiac condition (as listed in Table B4) is the underlying cause of death in the calendar year. Numerator data are reported for NSW, Qld, WA, SA, and the NT.	Population as at 30 June. Denominator data are reported for NSW, Qld, WA, SA, and the NT.	NMD and ABS population data
6.2.2	Cardiac mortality—in-hospital deaths for cardiac-related hospitalisations.	Crude rate: Numerator ÷ Denominator x 100,000. ASR was used in figures 6.2.2a, 6.2.2b, and 6.2.2d.	Number of hospitalisations with a principal diagnosis of cardiac condition (as listed in Table B4), and a care type not equal to 'newborn—unqualified days only' or 'organ procurement—posthumous', or 'hospital boarder', and a separation mode equal to 'died'.	Population at the middle of the financial year, calculated from the average of the populations as at 30 June at the beginning and end of the financial year.	NHMD and ABS population data

(a) $ASR = \frac{\sum_i N_i p_i}{\sum_i N_i}$ where: p_i is the age-specific rate for the age group i in the population being studied, N_i is the population of the age group and i is the standard population.

(b) *Period of care* is contiguous episodes of care, separated only by a transfer within hospitals or between hospitals, and combined into a single 'period of care'. This was estimated by excluding hospitalisations ending in transfer to another acute hospital, so that only the 'last' hospitalisation was counted.

(c) Cause of Death Unit Record File data are provided to the AIHW by the registries of births, deaths and marriages and the National Coronial Information System (managed by the Victorian Department of Justice) and include cause of death coded by the ABS. The data are maintained by the AIHW in the NMD. Deaths registered in 2014 and earlier are based on the final version of cause of death; deaths registered in 2015 are based on a revised version; and deaths registered in 2016 and 2017 are based on preliminary versions. Revised and preliminary versions are subject to further revision by the ABS.

Table B2: MBS items

MBS item group	MBS item number	Description
MBS health assessment items	700–714, 715, 716–719	General health assessment, including of a patient who is of Aboriginal or Torres Strait Islander descent.
Diagnostic procedures and investigations ^(a)	11700–11727	Electrocardiography monitoring, including during exercise or pharmacological stress, ambulatory electrocardiography monitoring, blood dye dilution indicator test, implanted pacemaker testing, and implanted defibrillator testing.
Diagnostic imaging services ^(a)	55113–55136, 57360, 57361, 59903–59973	Includes echocardiography (includes exercise and pharmacological stress echocardiography), computed tomography, and angiocardiology.
Therapeutic procedures ^{(a)(b)}	38200–38766, 13400	Includes cardiac catheterisation, selective coronary angiography, endovascular interventional procedures, and coronary artery bypass.
GP management plan	721	Preparation of a GP management plan by a medical practitioner (including a GP, but not a specialist/consultant physician).
Team care arrangements	723	Preparation of team care arrangement by a medical practitioner (including a GP, but not a specialist/consultant physician).
Allied health services	10950–10954, 10956, 10958, 10960, 10962, 10964, 10966, 10968, 10970, 80000, 80005, 80010, 80015, 80020, 80100, 80105, 80110, 80115, 80120, 80125, 80130, 80135, 80140, 80145, 80150, 80155, 80160, 80165, 80170, 81000, 81005, 81010, 81100, 81105, 81110, 81115, 81120, 81125, 81300, 81305, 81310, 81315, 81320, 81325, 81330, 81335, 81340, 81345, 81350, 81355, 81360, 82300, 82306, 82309, 82312, 82315, 82318, 82324, 82327, 82332	Includes Aboriginal and Torres Strait Island health services, dietetics services, diabetes services, audiology services, mental health services, occupational therapy, physiotherapy, exercise physiology, podiatry, chiropractic, osteopathy, psychology, and speech pathology.
Practice nurse monitoring and support	10997	Service provided to a person with a chronic disease by a practice nurse or an Aboriginal and Torres Strait Islander health practitioner.
Review of a GP management plan and team care arrangement	732	Review of a GP management plan or team care arrangement by a medical practitioner (including a GP, but not a specialist or consultant physician).
Contribution to a multidisciplinary care plan	729, 731	Contribution to a multidisciplinary care plan by a medical practitioner (including a GP but not a specialist or consultant physician).
Specialist review	Group A3 services items (99, 104–109, 113) and A4 services items (110, 112, 116, 119, 122, 128, 131–133)	Professional attendance on a patient by a consultant physician practising in his or her speciality.

(a) In this report, patients who received MBS items within 'diagnostic procedures and investigations', 'diagnostic imaging services' or therapeutic procedures' are classified as having a suspected or diagnosed cardiac condition.

(b) In this report, patients who received MBS items listed within the 'therapeutic procedures' group are classified as having a cardiac condition.

Table B3: Australian Classification of Health Interventions (ACHI), 9th edition procedure codes

Procedure	ACHI code	Description	
PCI	38300-00	Percutaneous transluminal balloon angioplasty of 1 coronary artery	
	38303-00	Percutaneous transluminal balloon angioplasty of 2 or more coronary arteries	
	38306-00	Percutaneous insertion of 1 transluminal stent into single coronary artery	
	38306-01	Percutaneous insertion of 2 or more transluminal stents into single coronary artery	
	38306-02	Percutaneous insertion of 2 or more transluminal stents into multiple coronary arteries	
	38309-00	Percutaneous transluminal coronary rotational atherectomy, 1 artery	
	38312-00	Percutaneous transluminal coronary rotational atherectomy, 1 artery with insertion of 1 stent	
	38312-01	Percutaneous transluminal coronary rotational atherectomy, 1 artery with insertion of 2 or more stents	
	38315-00	Percutaneous transluminal coronary rotational atherectomy, multiple arteries	
	38318-00	Percutaneous transluminal coronary rotational atherectomy, multiple arteries with insertion of 1 stent	
	38318-01	Percutaneous transluminal coronary rotational atherectomy, multiple arteries with insertion of 2 or more stents	
	90218-00	Percutaneous transluminal coronary angioplasty with aspiration thrombectomy, 1 artery	
	90218-01	Percutaneous transluminal coronary angioplasty with aspiration thrombectomy, multiple arteries	
	90218-02	Percutaneous transluminal coronary angioplasty with embolic protection device, 1 artery	
	90218-03	Percutaneous transluminal coronary angioplasty with embolic protection device, multiple arteries	
	38300-01	Open transluminal balloon angioplasty of 1 coronary artery	
	38303-01	Open transluminal balloon angioplasty of 2 or more arteries	
	38306-03	Open insertion of 1 transluminal stent into single coronary artery	
	38306-04	Open insertion of 2 or more transluminal stents into single coronary artery	
	38306-05	Open insertion of 2 or more transluminal stents into multiple coronary arteries	
	38505-00	Open coronary endarterectomy	
	Diagnostic angiography	38215-00	Coronary angiography
		38218-00	Coronary angiography with left heart catheterisation
		38218-01	Coronary angiography with right heart catheterisation
		38218-02	Coronary angiography with right heart catheterisation
	CABG	38497-00	Coronary artery bypass, using 1 saphenous vein graft
38497-01		Coronary artery bypass, using 2 saphenous vein grafts	
38497-02		Coronary artery bypass, using 3 saphenous vein grafts	
38497-03		Coronary artery bypass, using 4 or more saphenous vein grafts	
38497-04		Coronary artery bypass, using 1 other venous graft	
38497-05		Coronary artery bypass, using 2 other venous grafts	
38497-06		Coronary artery bypass, using 3 other venous grafts	
38497-07		Coronary artery bypass, using 4 or more other venous grafts	
38500-00		Coronary artery bypass, using 1 left internal mammary artery graft	

(continued)

Table B3 (continued): Australian Classification of Health Interventions (ACHI), 9th edition procedure codes

Procedure	ACHI code	Description
CABG (continued)	38500-01	Coronary artery bypass, using 1 right internal mammary artery graft
	38500-02	Coronary artery bypass, using 1 radial artery graft
	38500-03	Coronary artery bypass, using 1 epigastric artery graft
	38500-04	Coronary artery bypass, using 1 other arterial graft
	38500-05	Coronary artery bypass, using 1 composite graft
	38503-00	Coronary artery bypass, using 2 or more left internal mammary artery grafts
	38503-01	Coronary artery bypass, using 2 or more right internal mammary artery grafts
	38503-02	Coronary artery bypass, using 2 or more radial artery grafts
	38503-03	Coronary artery bypass, using 2 or more epigastric artery grafts
	38503-04	Coronary artery bypass, using 2 or more other arterial grafts
	38503-05	Coronary artery bypass, using 2 or more composite grafts
	90201-00	Coronary artery bypass, using 1 other graft, not elsewhere classified
	90201-01	Coronary artery bypass, using 2 other grafts, not elsewhere classified
	90201-02	Coronary artery bypass, using 3 other grafts, not elsewhere classified
90201-03	Coronary artery bypass, using 4 or more other grafts, not elsewhere classified	

Source: ACCD 2015.

Table B4: ICD-10, Australian modification codes

Code	Condition
I21.0, I21.1, I21.2, I21.3	STEMI
I21.4	Non-STEMI
I21.9	Unspecified AMI
I20.0	Unstable angina
I20.1–I20.9	Stable angina
I23–I25	Other coronary heart disease
I00–I52	Cardiac conditions, including ARF, chronic RHDs, hypertensive diseases, ischaemic heart diseases, pulmonary heart disease, diseases of pulmonary circulation, and other forms of heart disease

Appendix C: Summary results, by measure

Table C1: Summary results, including numerator and denominator data, for the Better Cardiac Care measures

Measures (unit applicable to rates)	Indigenous				Non-Indigenous			
	Numerator	Denominator	Crude rate	ASR	Numerator	Denominator	Crude rate	ASR
1.1 Annual health assessments, 2017–18 (%)	237,501	769,682	30.9	..	..	..	..	..
1.2 Cardiovascular disease risk assessment, June 2018, high risk (%)	4,947	16,626	29.7	..	..	..	..	..
2.1 Cardiac-related diagnosis, 2017–18 (%)	89,201	769,682	11.6	10.7	4,790,825	24,130,443	19.8	9.4
2.3 Suspected or confirmed cardiac disease case review by a specialist, 2017–18 (%)	60,745	100,166	60.6	54.3	4,160,400	5,037,347	82.6	68.3
3.1 STEMI events treated by PCI, 2014–2017 (%)	691	1,068	64.7	64.2	18,697	25,008	74.8	79.5
3.3 ACS events that included diagnostic angiography or definitive revascularisation, 2014–2017 (%)	3069	5,751	53.4	55.1	70,294	120,710	58.2	67.4
3.5 AMI in-hospital mortality rates, 2014–2017 (%)	137	3,800	3.6	3.0	4,767	85,584	5.6	2.8
4.2 Follow-up after receiving a cardiovascular therapeutic procedure, 2016–17 (%)	712	1,081	65.9	n.a.	55,973	114,386	48.9	n.a.
4.3 Specialist review after a cardiovascular therapeutic procedure, 2016–17 (%)	894	1,081	82.7	n.a.	109,391	114,386	95.6	n.a.
5.1.1 Incidence of ARF, 2017 (number per 100,000)	484	436,243	110.9	n.a.	42	9,042,221	0.5	n.a.
5.1.2 New registrations of RHD, 2017 (number per 100,000)	224	436,243	51.3	n.a.	34	9,042,221	0.4	n.a.
5.2 Recurrent ARF, 2016–2017 (%)	241	920	26.2	n.a.	11	65	16.9	n.a.
5.3 Treatment with benzathine penicillin G doses, 2017, more than 100% of doses (%)	394	2,630	15.0	n.a.	12	77	15.6	n.a.
6.1 Hospitalisations for cardiac conditions, 2014–2017 (number per 1,000)	32,088	2,211,449	14.5	25.8	1,091,173	69,901,680	15.6	13.2
6.2.1 Deaths from cardiac conditions, 2015–2017 (number per 100,000)	1,614	1,970,916	81.9	167.8	65,211	49,377,371	132.1	107.5
6.2.2 In-hospital deaths for cardiac conditions, 2014–15 to 2016–17 (number per 100,000)	710	2,211,449	32.1	64.0	26,223	69,901,680	37.5	31.2

ASR = Age-standardised rate

Notes

1. Data for measure 3.1 are for all jurisdictions, except the Australian Capital Territory. Data for measures 3.5 and 6.2.2 are for New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory. Data for measures 5.1.1, 5.1.2, 5.2 and 5.3 are for Queensland, Western Australia, South Australia and the Northern Territory. Data for measure 6.2.1 are for New South Wales, Queensland, Western Australia, South Australia and the Northern Territory. Data for other measures are for all states and territories.
2. See Appendix B for detailed technical specifications for these measures, including the data source(s) used.

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Abbreviations

ABS	Australian Bureau of Statistics
ACS	acute coronary syndrome
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
AMI	acute myocardial infarction
ARF	acute rheumatic fever
BPG	benzathine penicillin G
CABG	coronary artery bypass graft
CARPA	Central Australian Rural Practitioners Association
CVD	cardiovascular disease
GAS	group A streptococcus
GP	general practitioner
ICD-10	International Statistical Classification of Diseases and Relation Health Problems, 10 th Revision
MBS	Medicare Benefits Schedule
NHMD	National Hospital Morbidity Database
nKPI	National Key Performance Indicators
NMD	National Mortality Database
NSW	New South Wales
NT	Northern Territory
NVDPA	National Vascular Disease Prevention Alliance

PCI	percutaneous coronary intervention
PCIS	Primary Care Information System
Qld	Queensland
RHD	rheumatic heart disease
RHDR	rheumatic heart disease register
SA	South Australia
STEMI	ST-segment-elevation myocardial infarction
Tas	Tasmania
Vic	Victoria
WA	Western Australia

Symbols

..	not applicable
n.a.	not available
no.	number

Glossary

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

acute coronary syndrome (ACS): An acute myocardial infarction (**heart attack**) and unstable angina when a patient first presents as a clinical emergency with chest pain or other features.

acute myocardial infarction (AMI): A term commonly used to mean a **heart attack**, but more correctly refers only to those heart attacks that have caused some death of heart muscle.

acute rheumatic fever (ARF): An acute, serious disease that affects mainly children and young adults, and can damage the heart valves, the heart muscle and its lining, the joints and the brain. It is brought on by a reaction to a throat infection by a particular bacterium.

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

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

care type: Describes the overall nature of clinical service provided to an **admitted patient** during an episode of care (METeOR identifier: 491557). Care types for admitted patients are classified as:

- acute care
- rehabilitation care
- palliative care
- geriatric evaluation and management
- psychogeriatric care
- maintenance care
- newborn care
- other admitted patient care (where the principal clinical intent does not meet the criteria for any of the other categories).

coronary artery bypass graft (CABG): Surgical procedure using blood vessel grafts to bypass blockages in the coronary arteries and restore adequate blood flow to the heart muscle.

definitive revascularisation procedure: A procedure used to increase coronary artery blood flow (such as **percutaneous coronary intervention** and **coronary artery bypass graft**).

diagnostic angiography: A medical imaging technique used to visualise the inside of blood vessels. It enables the diagnosis of various disorders and injuries to the blood vessels.

heart attack: A life-threatening emergency that occurs when a vessel supplying blood to the heart muscle is suddenly blocked completely by a blood clot. The medical term commonly used for a heart attack is **acute myocardial infarction**.

hospitalisation (separation): An episode of care for an **admitted patient**, which 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: A term used interchangeably with **Aboriginal and Torres Strait Islander** in this report.

mode of separation: The status at **separation** of an **admitted patient** (discharge, transfer or death), and the place to which a patient is released (where applicable) (METeOR identifier: 270094).

non-Indigenous: A term used to describe people who indicated they are not of Aboriginal and/or Torres Strait Islander origin. Compare with **Other Australians**.

non-ST-segment-elevation acute coronary syndrome: A syndrome that encompasses both unstable angina (pressure in the chest while at rest or doing light physical activity) and non-ST-segment-elevation myocardial infarction (the less severe type of heart attack). See also **ST-segment-elevation myocardial infarction**.

Other Australians: A term used to describe 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**.

percutaneous coronary intervention (PCI): A surgical procedure used to restore blood flow to blocked coronary arteries. Two types are used: coronary angioplasty without stent, and coronary stenting.

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: An expression of the relative difference between populations by taking scale into account; for this report, it was calculated as the rate for Indigenous Australians divided by the rate for non-Indigenous Australians. It is interpreted as follows:

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

rheumatic heart disease (RHD): A chronic disease from damaged heart valves caused by earlier attack(s) of **acute rheumatic fever**.

separation: See **hospitalisation**.

ST-segment-elevation myocardial infarction (STEMI): Heart attacks are divided into 2 types, according to their severity; a STEMI is the more severe type. In a STEMI, the artery supplying an area of the heart muscle is completely blocked. See also **non-ST-segment-elevation acute coronary syndrome**.

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Related publications

This report, *Better Cardiac Care measures for Aboriginal and Torres Strait Islander people: fourth national report 2018–19*, is part of a series of reports. Earlier editions can be downloaded from <https://www.aihw.gov.au/reports/indigenous-australians/better-cardiac-care-measures-2017/report-editions>.

The following AIHW publications relating to the Better Cardiac Care project, and the health of Aboriginal and Torres Strait Islander people, might also be of interest:

AIHW 2016. Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011. Cat. no. BOD 7. Canberra: AIHW.

AIHW 2013. Rheumatic heart disease and acute rheumatic fever in Australia 1996–2012. Cat. no. CVD 60. Canberra: AIHW.

These reports can be downloaded from <http://www.aihw.gov.au/publications>. The website also includes information on ordering printed copies.



This is the fourth national report on the 21 Better Cardiac Care measures for Aboriginal and Torres Strait Islander people, with updated data available for 14 measures. The level of access for cardiac-related health services is improving for Indigenous Australians. While the mortality rate from cardiac conditions is falling among the Indigenous population, it is still higher than among non-Indigenous Australians. The incidence of acute rheumatic fever among Indigenous Australians continues to be much higher than in non-Indigenous Australians.

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