

Plain language review of cardiovascular health among Indigenous Australians

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1. Australian Indigenous HealthInfoNet

Preface

This Plain language review of cardiovascular health among Indigenous Australians is based on the *Review of cardiovascular health among Indigenous Australians* (2013) by Caitlin Gray, Alex Brown and Neil Thomson.

Introduction

Cardiovascular health involves the heart, arteries, veins and other components of the circulatory system. Cardiovascular disease (CVD) is a term used to include all of the major diseases of the heart and circulatory system:

- coronary (ischaemic) heart disease (CHD)
- heart failure
- cerebrovascular disease (including stroke) (CBVD)
- peripheral vascular disease
- rheumatic heart disease (RHD);

as well as key risk factors such as:

- hypertension (high blood pressure)
- high blood cholesterol [1].

CVD is usually caused by damage to the blood supply of the heart, brain, and/or legs, with the exception of RHD, which involves damage to the heart valves as a result of (usually) repeated episodes of acute rheumatic fever (ARF) caused by bacterial infections.

Many of the CVDs share common risk factors including:

- tobacco smoking
- physical inactivity

Contents

Preface.....	1
Introduction	1
What is known about cardiovascular disease among Indigenous people?	2
What do we know about the hospitalisation of Indigenous people for CVD?	2
What do we know about deaths of Indigenous people because of CVD?.....	3
What is known about specific CVD conditions among Indigenous people?.....	4
What do we know about risk factors contributing to CVD among Indigenous people?.....	5
What do we know about the care received by Indigenous people with CVD?	6
How can CVD be prevented?.....	6
What are the main problems faced by Indigenous people living with CVD?	6
Key developments	6
Future directions.....	7
Summary	7
References	8

More detailed information about cardiovascular health in Indigenous people can be found at:

http://www.healthinonet.ecu.edu.au/heart_review

- poor nutrition
- being overweight and obese
- high blood pressure
- high blood cholesterol
- diabetes [2, 3].

Many of these risk factors are largely preventable and, if addressed, could reduce the extent (size) and burden (impact) of CVD among Indigenous¹ people. Other risk factors include socioeconomic and psychosocial factors. The exception is RHD (including ARF), which is specifically associated with poor living conditions.

What is known about cardiovascular disease among Indigenous people?

Cardiovascular disease (CVD) is a major health problem for all Australians, but the extent and burden are much greater for Indigenous people than they are for other Australians. CVD is the leading cause of premature (early) death, and death overall, for Indigenous people, as it is for all Australians [4-8].

Box 1: Measures of CVD

Prevalence: the proportion (percentage) of people with CVD. The proportion can relate to specific populations, such as the total population, the male population, the female population and those in specific age-groups (such as females aged 40-44 years).

Hospitalisation rates: the number of episodes of hospitalisations for a specific population in one year per 1,000 people in that population.

Death rates: the number of deaths for a specific population in one year per 100,000 people in that population.

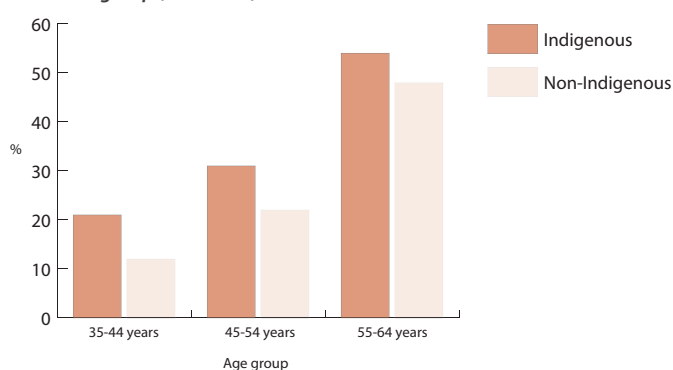
The following statistics and Figure 1 [5] show the differences between Indigenous and non-Indigenous people for CVD in 2004-2005:

- more Indigenous people than non-Indigenous people (in all age groups) had CVD
- the onset of CVD was at younger ages among Indigenous people

than non-Indigenous people

- Indigenous males were 1.2 times more likely to experience CVD than were non-Indigenous males
- Indigenous females were 1.4 times more likely to experience CVD than were non-Indigenous females [5].

Figure 1. Prevalence (%) of CVD, by Indigenous status and selected age groups, Australia, 2004-2005



Source: Australian Bureau of Statistics, 2008 [5]

What do we know about the hospitalisation of Indigenous people for CVD?

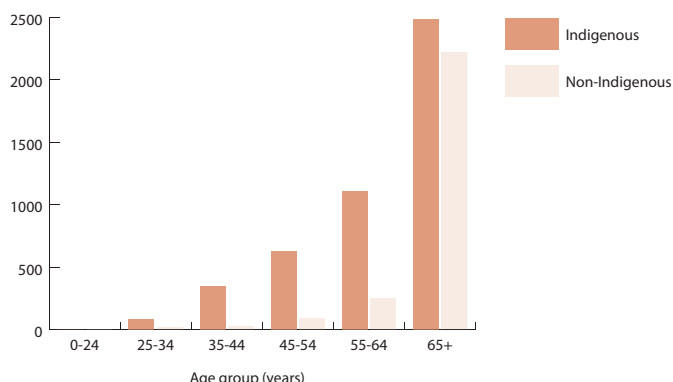
In 2008-09, hospitalisation for CVD was more common among Indigenous people than non-Indigenous people across all age groups, with the greatest disparity (differences) being seen in the young and middle adult years. Overall hospitalisation rates for CVD were almost twice as high for Indigenous people than they were for non-Indigenous people [9].

The more detailed information available for the two-year period July 2006 to June 2008 show that hospitalisations of Indigenous people for CVD:

- were 1.4 times higher for Indigenous males than they were for non-Indigenous males
- were 1.8 times higher for Indigenous females than they were for non-Indigenous females
- made up 3% of all hospitalisations of Indigenous people during this time period
- made up 1.8% of all hospitalisations for CVD in Australia
- were higher among Indigenous males than among Indigenous females, and increased with age for both Indigenous and non-Indigenous people
- were higher for Indigenous people than for non-Indigenous people across all age groups (Figure 2) [10].

¹ The term Indigenous is used in this review to refer generally to the two Indigenous populations of Australia –Aboriginal people and Torres Strait Islander people.

Figure 2. Hospitalisation rates for CVD, by Indigenous status and age group, NSW², Vic, Qld, WA, SA and the NT, 2006-2008



Source: Australian Institute of Health and Welfare, 2011 [10]

What do we know about deaths of Indigenous people because of CVD?

CVD was the leading cause of death among Indigenous people between July 2006 and June 2008, at a rate almost twice as high as that for non-Indigenous people. Death rates for CVD are higher among Indigenous people than among non-Indigenous people across all age groups: the greatest disparity occurs among those aged 35-54 years [10]. In 2010, CVD accounted for 668 deaths among Indigenous people, which is just over one-quarter (26%) of all deaths among Indigenous people [8]. CHD and CBVD were the two most common causes of death from CVD.

Coronary heart disease (CHD):

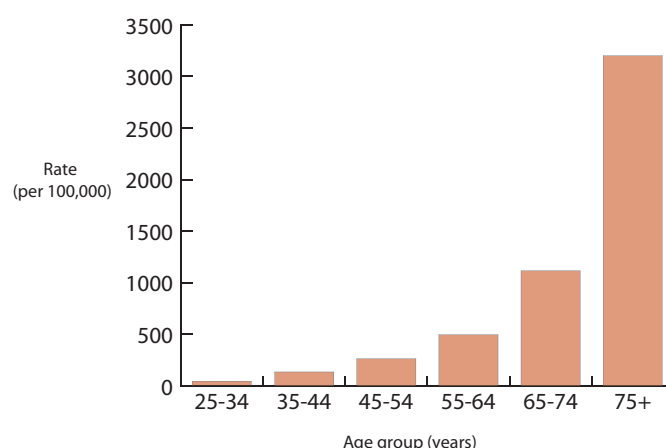
- was the leading cause of death among Indigenous people (349 deaths)
- accounted for 13% of all deaths and 52% of cardiovascular deaths among Indigenous people (it was also the leading cause of death for non-Indigenous people) [8, 10]
- death rates were almost twice as high for Indigenous people as they were for non-Indigenous people
- deaths were 2.1 times more common for Indigenous males than for Indigenous females [8]
- the number of deaths were highest among the 55-64 years age group (278 deaths).

Cerebrovascular disease (CBVD):

- was responsible for 119 deaths among Indigenous people
- accounted for 5% of all Indigenous deaths
- accounted for 18% of the deaths among Indigenous people from CVD
- death rates were 1.8 times higher among Indigenous people than non-Indigenous people
- death rates were 1.4 times higher for Indigenous females than for Indigenous males [8].

The more detailed information available for the five-year period 2004-2008 show that the rates of deaths among Indigenous people from CVD were almost double the rates among non-Indigenous people [10]. CVD accounted for the most deaths among Indigenous people for all age groups [10]. As is the case for non-Indigenous people, CVD death rates increase with age, particularly from the middle adult years (Figure 3) [10].

Figure 3. Death rates from CVD among Indigenous people, by selected age groups, NSW, Qld, WA, SA and the NT, 2004-2008



Source: Australian Institute of Health and Welfare, 2011 [10]

2 In this review the following acronyms are used for the states and territories: New South Wales (NSW); Victoria (Vic); Queensland (Qld); Western Australia (WA); South Australia (SA); Tasmania (Tas); Australian Capital Territory (ACT); and Northern Territory (NT).

What is known about specific CVD conditions among Indigenous people?

Coronary heart disease

Coronary heart disease (CHD) is a disorder of the blood vessels (arteries) that supply oxygen-rich blood to the heart muscle. If the oxygen supply to the heart muscles is restricted, the heart cannot pump blood around the body properly. The following statistics show that the burden of CHD is higher among Indigenous people than non-Indigenous people:

- in 2004-05:
 - Indigenous males were 1.7 times more likely and Indigenous females 2.7 times more likely to experience CHD than were their non-Indigenous counterparts [5]
- from June 2006 to June 2008:
 - hospitalisation rates for CHD were 2.1 times higher for Indigenous people than for their non-Indigenous counterparts; rates for acute myocardial infarction (heart attack) were 2.5 times higher among Indigenous people than among non-Indigenous people [10]
- from 2004-2008:
 - death rates for CHD were 1.8 times higher for Indigenous people than for non-Indigenous people; the greatest disparity in rates was for people aged 35-54 years
 - for acute myocardial infarction (heart attack) death rates were 1.7 times higher for Indigenous people than non-Indigenous people [10].

Cerebrovascular disease

Cerebrovascular disease (CBVD) refers to conditions of the blood vessels that supply blood to the brain. A stroke, the most common form of CBVD, occurs when blood flow to a part of the brain is reduced or stops. This can be caused by a blocked or burst blood vessel. A part of the brain may be permanently damaged and no longer work properly. This may result in a long-lasting disability, depending on the area of the brain where this happens. The following statistics show that the burden of CBVD is greater for Indigenous people than for non-Indigenous people:

- in 2004-05:
 - Indigenous males were 1.5 times more likely and Indigenous females 1.9 times more likely to experience CBVD than were their non-Indigenous counterparts [5]

- from June 2006 to June 2008:
 - hospitalisation rates for CBVD were 1.8 times higher for Indigenous people than for their non-Indigenous counterparts; rates for stroke were 1.9 times higher among Indigenous people than non-Indigenous people
 - death rates for CBVD were 1.6 times higher for Indigenous people than for non-Indigenous people [10].

Hypertension

Hypertension (high blood pressure) refers to the elevation of blood pressure over a prolonged period of time. High blood pressure causes the heart to work harder, and can cause damage to the heart, making it weak and enlarged. The following statistics show that the burden from hypertension is greater for Indigenous than for non-Indigenous people:

- in 2004-05:
 - hypertension was more common for Indigenous people than for non-Indigenous people across all age groups; the age of onset (beginning of the disease) was younger for Indigenous people than for non-Indigenous people
 - Indigenous males were 1.5 times more likely and Indigenous females 1.7 times more likely to experience hypertension than were their non-Indigenous counterparts [5]

from June 2004 to June 2008:

- hospitalisation rates for hypertension were 2.5 times higher for Indigenous people than for their non-Indigenous counterparts [10]

Deaths from hypertension are not common, but it is a major risk factor for fatal CVD, including CHD and CBVD [11].

Acute rheumatic fever and rheumatic heart disease

Acute rheumatic fever (ARF) is a disease that can cause damage to the heart valves, muscle and lining, as well as the connective tissue in the brain and other parts of the body such as joints. ARF, which generally develops about two to three weeks after an infection of the pharynx (throat) by the streptococcus bacterium, can lead to rheumatic heart disease (RHD), causing long-term damage to the heart valves and muscle. ARF and new cases of RHD are now almost exclusively experienced by Indigenous people in Australia, particularly among Indigenous children and young adults. The following statistics show the burden that Indigenous people suffer from this disease. During a four-year period from 2006 to

2009, in the NT, there were 216 notifications³ of new and recurrent (repeated) cases of ARF [10]:

- of these cases, almost all (213 or 99%) were Indigenous people
- recurrent cases made up over one-quarter (28%) of all cases
- almost two-thirds (65%) of the Indigenous notifications were for children aged 5-14 years
- rates for ARF were highest for Indigenous females in the 5-14 years age group; Indigenous females accounted for more notifications of ARF than Indigenous males across all age groups (except 0-4 years age group)
- data from Qld and WA show similar patterns to that of the NT [12].

In Australia in 2009-10, there were 2,666 hospitalisations for ARF and RHD:

- females had higher rates of hospitalisation, 1.3 times higher for females than for males; rates for females were higher than those for males across all age groups (except the 15-19 year old age group)
- the NT had the highest levels of hospitalisations (86 per 100,000) compared with Qld (15 per 100,000) and WA (12 per 100,000) [12].

During 2007-2009, in Australia, there were 897 deaths with RHD reported as the underlying cause. Deaths from RHD:

- accounted for 0.6% of all CVD deaths
- accounted for 0.2% of all deaths
- were higher among females than males (1.5 times the level) [12].

This is consistent with the higher prevalence and hospitalisation rates of RHD among females.

What do we know about risk factors contributing to CVD among Indigenous people?

The factors contributing to the increased levels of CVD among Indigenous people are complex, and reflect broad historical, cultural and economic factors, as well as behavioural (based on an individual's behaviour) and biomedical (based on genetics and lifestyle) risk factors [2].

Behavioural and biomedical risk factors for CVD include:

- tobacco smoking

- physical inactivity
- poor nutrition
- being overweight or obese
- risky alcohol consumption
- hypertension (high blood pressure)
- high blood cholesterol
- diabetes
- chronic kidney disease [1, 2, 13].

Indigenous people were more likely than non-Indigenous people to have multiple (many) risk factors. Indigenous people also had higher levels of all the risk factors for CVD than non-Indigenous people. This was particularly so for diabetes, which was four times more common for Indigenous people than for non-Indigenous people and smoking which was twice as common.

Social and emotional wellbeing (SEWB) is an important contributing factor to the development, management and outcome of CVD among Indigenous people. SEWB factors have a particular bearing on the cause and expected outcome of CHD, and have now been recognised to be of similar importance as the behavioural and biomedical risk factors [2, 14, 15]. The SEWB factors include:

- social isolation
- stress
- depression
- lack of social support.

These aspects are related to social and cultural factors (known as the social and cultural determinants of health):

- cultural and historical factors, including loss of land and disruption to culture, language and identity
- environmental and socioeconomic factors, including poor housing, low levels of education, low income
- psychosocial stressors, including the death of a family member or close friend, serious injury or disability
- limited access to appropriate health care, both preventive and clinical [2, 16-18].

These 'upstream' factors mentioned above can influence behaviour, which can then contribute to biomedical risk factors. For example low socioeconomic status may contribute to behaviours such as physical inactivity or poor nutrition, which in turn can contribute to high blood pressure and high cholesterol levels [2]. Many Indigenous people with CVD have other health problems and multiple behavioural and biomedical risk factors, which together can magnify the risk of CVD.

3 Notification – In NT, WA and Qld records are kept by a government authority of all confirmed cases of ARF.

What do we know about the care received by Indigenous people with CVD?

Current levels of care

Despite higher prevalence and hospitalisation rates of CVD, Indigenous people do not receive the same level of care for CVD as do non-Indigenous people [10, 19-21]. This difference is seen in services relating to:

- primary prevention and management
- emergency and acute care
- rehabilitation
- ongoing management
- secondary prevention.

In 2010, Indigenous people hospitalised with CVD were less likely than non-Indigenous people to receive a procedure⁴ (57% compared with 74%) [10].

Greater need for care

The high level and earlier onset of CVD in the Indigenous population are likely to lead to greater need for cardiac care [21]. Reflecting this, the need for improved care has been recognised for Indigenous people in the following health care settings:

- coordinated care across the continuum of service
- in-hospital care
- pre-hospital diagnosis and evacuation for remote areas
- post-hospital care
- consistent data
- awareness of disparity in hospital care [21].

How can CVD be prevented?

Much of the impact of CVD is preventable, in terms of both initial onset of the disease (primary prevention) and management and control of established disease (secondary prevention and rehabilitation) [1, 2, 22]. Due to the largely preventable nature of the disease, and the associated high levels of health burden and costs in Australia, CVD has attracted substantial attention. This has

contributed to advances in cardiovascular health in mainstream Australia, but this has not been translated fully to the Indigenous population, evidenced through the continuing high prevalence, and hospitalisation and death rates of Indigenous people from CVD [23-25].

What are the main problems faced by Indigenous people living with CVD?

Indigenous people are culturally diverse, with cultural differences providing unique access issues for health care services [16, 26]. Health service planning should consider the needs of individual communities and the rates of disease, rather than adopting a 'one size fits all' approach. Therefore, while primary prevention strategies might vary little across communities, the level of resourcing for screening and treatment programs should depend on the disease burden (amount of loss of healthy life) [27].

Other barriers to adequate care that are experienced by Indigenous people include:

- poor coordination across the health system
- socioeconomic disadvantage
- poor access to acute care services
- poor access to primary and specialist health care
- sub-optimal (less than best) provision of in-hospital services
- the availability of transport to health services
- delays in presentation
- language and cultural differences [16, 28-34].

Key developments

Some key developments that have taken place in the area of Indigenous Australian cardiovascular health include:

- National chronic disease strategy – this is not specific for Indigenous people but includes recognition that Indigenous people experience different barriers to health care and that health service provision must incorporate cultural respect [35]
- The rheumatic fever strategy – aims to address RHD (including ARF) among Indigenous people through both prevention and treatment programs [36]
- Cardiac geographic information system – a report and maps for primary health care providers and cardiac rehabilitation services, which assists them in locating services and mapping cases of cardiac illness [18]

4 Procedure – a course of action (such as measuring, diagnosing or treating) intended to achieve a result in the care of persons with a medical condition

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- Medical specialist outreach assistance program – funded by the Australian Department of Health to improve access to medical specialist services for people living in rural and remote Australia [37]
 - Indigenous chronic disease fund – The Australian Government budget for 2011-12 included the objective of improving the prevention and management of chronic disease through the Aboriginal and Torres Strait Islander chronic disease fund [38].

Future directions

Comprehensive primary health care programs and increased training and support for health care providers will provide a basis for addressing the inequalities in health care for Indigenous people. More accessible and culturally appropriate primary health care should enable Indigenous people with CVD to be identified earlier in the course of their illness and have comorbidities (two or more illnesses) treated in a more timely manner [33, 39]. This would be better achieved by more involvement of Indigenous patients in decision-making and greater development of key services including:

- Aboriginal Health Workers
- liaison officers
- interpreters [26, 30, 40].

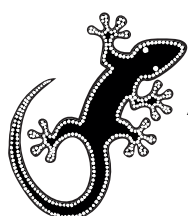
Summary

Indigenous people experience poorer cardiovascular health than do other Australians. CVD makes the largest contribution to the differences in health between Indigenous and non-Indigenous people. The factors contributing to the high levels of CVD and the associated hospitalisation and mortality levels among Indigenous people are complex. The high levels of behavioural and biomedical risk factors seen among Indigenous people are clearly associated with the high levels of CVD, but these factors cannot be seen in isolation; they must be viewed within a 'social and cultural determinants' context. As with other areas of Indigenous health, historical, socio-cultural, and economic aspects are the 'upstream' factors within which the behavioural and biomedical risk factors and the actual impacts of CVD should be viewed. The factors that contribute to the development of CVD among Indigenous people are very important, and key developments that address these factors will contribute to 'closing the gap' in health between Indigenous and other Australians.

References

1. Australian Institute of Health and Welfare, *Cardiovascular disease: Australian facts 2011*, 2011, Australian Institute of Health and Welfare: Canberra.
2. Penm, E., *Cardiovascular disease and its associated risk factors in Aboriginal and Torres Strait Islander peoples 2004-05*, 2008, Australian Institute of Health and Welfare: Canberra.
3. Taylor, J. and N. Biddle, *Locations of Indigenous population change: what can we say?*, 2008, Centre for Aboriginal Economic Policy Research: Canberra.
4. Australian Bureau of Statistics. *National Aboriginal and Torres Strait Islander social survey, 2008*. 2009 11 April 2011; Available from: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4714.0?OpenDocument>.
5. Australian Bureau of Statistics, *National Aboriginal and Torres Strait Islander Health Survey: Australia, 2004-05*, 2006, Australian Bureau of Statistics: Canberra.
6. Australian Bureau of Statistics and Australian Institute of Health and Welfare, *The health and welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2008*, 2008, Australian Bureau of Statistics and Australian Institute of Health and Welfare: Canberra.
7. Australian Bureau of Statistics, *Deaths, Australia, 2010*, 2011, Australian Bureau of Statistics: Canberra.
8. Australian Bureau of Statistics, *Causes of death, Australia, 2010*, 2012, Australian Bureau of Statistics: Canberra.
9. Australian Institute of Health and Welfare, *Australian hospital statistics 2008-09*, 2010, Australian Institute of Health and Welfare: Canberra.
10. Australian Institute of Health and Welfare, *Aboriginal and Torres Strait Islander health performance framework 2010: detailed analyses*, 2011, Australian Institute of Health and Welfare: Canberra.
11. National Heart Foundation, *Guide to management of hypertension 2008: updated December 2010*, 2010, National Heart Foundation: Deakin, ACT.
12. Australian Institute of Health and Welfare, *Rheumatic heart disease and acute rheumatic fever in Australia: 1996-2011*, 2013, Australian Institute of Health and Welfare: Canberra.
13. Australian Institute of Health and Welfare, *Australia's health 2010: the twelfth biennial report of the Australian Institute of Health and Welfare*, 2010, Australian Institute of Health and Welfare: Canberra.
14. Bunker, S.J., et al., "Stress" and coronary heart disease: psychosocial risk factors: National Heart Foundation of Australia position statement update. *Medical Journal of Australia*, 2003. **178**(6): p. 272-276.
15. Marmot, M., *Social determinants and the health of Indigenous Australians [editorial]*. *Medical Journal of Australia*, 2011. **194**(10): p. 512-513.
16. Thrift, A.G. and N. Hayman, *Aboriginal and Torres Strait Islander peoples and the burden of stroke*. *International Journal of Stroke*, 2007. **2**(1): p. 57-59.
17. Haysom, L., et al., *Cardiovascular risk factors in Australian Indigenous and non-Indigenous children: a population-based study*. *Journal of Paediatrics and Child Health*, 2009. **45**(1-2): p. 20-27.
18. National Health and Medical Research Council, *Cardiac rehabilitation geographic information system: geographic information system of cardiac rehabilitation services for Aboriginal and Torres Strait Islander peoples*, 2007, National Health and Medical Research Council: Canberra.
19. Wood, L., et al., *Beyond the rhetoric: how can non-government organisations contribute to reducing health disparities for Aboriginal and Torres Strait Islander people?* *Australian Journal of Primary Health*, 2011. **17**(4): p. 384-394.
20. Kilkenny, M.F., et al., *Hospital management and outcomes of stroke in Indigenous Australians: evidence from the 2009 Acute Care National Stroke Audit*. *International Journal of Stroke*, 2012. **Early View** (<http://dx.doi.org/10.1111/j.1747-4949.2011.00717.x>).
21. National Heart Foundation of Australia and Australian Healthcare and Hospitals Association, *Better hospital care for Aboriginal and Torres Strait Islander people experiencing heart attack*, 2010, National Heart Foundation of Australia: Canberra.
22. Australian Institute of Health and Welfare, *Aboriginal and Torres Strait Islander health performance framework: 2008 report: detailed analyses*, 2008, Australian Institute of Health and Welfare: Canberra.
23. Australian Institute of Health and Welfare, *The health and welfare of Australia's Aboriginal and Torres Strait Islander people: an overview 2011*, 2011, Australian Institute of Health and Welfare: Canberra.
24. Australian Bureau of Statistics, *Causes of death, Australia, 2009*, 2011, Australian Bureau of Statistics: Canberra.
25. Australian Institute of Health and Welfare, *Australian hospital statistics 2009-10*, 2011, Australian Institute of Health and Welfare: Canberra.
26. National Health and Medical Research Council, *Strengthening cardiac rehabilitation and secondary prevention for Aboriginal and Torres Strait Islander peoples: a guide for health professionals*, 2005, National Health and Medical Research Council: Canberra.
27. Hoy, W.E., S. Kondalsamy-Chennakesavan, and Z. Wang, *Quantifying the excess risk for proteinuria, hypertension and diabetes in Australian Aborigines: comparison of profiles in three remote communities in the Northern Territory with those in the Ausdiab study*. *Australian and New Zealand Journal of Public Health*, 2007. **31**(2): p. 177-183.
28. Faux, S., et al., *Stroke rehab down under: can Rupert Murdoch, Crocodile Dundee, and an Aboriginal elder expect the same services and care?* *Topics in Stroke Rehabilitation*, 2009. **16**(1): p. 1-10.
29. Cass, A., et al., *Sharing the true stories: improving communication between Aboriginal patients and healthcare workers*. *Medical Journal of Australia*, 2002. **176**(10): p. 466-470.
30. Thompson, S.C., et al., *Are the processes recommended by the NHMRC for improving Cardiac Rehabilitation (CR) for Aboriginal and Torres Strait Islander people being implemented?: an assessment of CR Services across Western Australia*. *Australia and New Zealand Health Policy*, 2009. **6**(29).

-
31. DiGiacomo, M., et al., *Health information system linkage and coordination are critical for increasing access to secondary prevention in Aboriginal health: a qualitative study*. *Quality in Primary Care*, 2010. **18**(1): p. 17-26.
 32. Australian Medical Association, *Aboriginal and Torres Strait Islander health report card 2010-11 : best practice in primary health care for Aboriginal peoples and Torres Strait Islanders*, 2011, Australian Medical Association: Canberra.
 33. Kowanko, I., et al., *Chronic condition management strategies in Aboriginal communities: final report 2011*, 2012, Flinders University and the Aboriginal Health Council of South Australia: Adelaide.
 34. Taylor, K.P., et al., "You're always hearing about the stats ... death happens so often": new perspectives on barriers to Aboriginal participation in cardiac rehabilitation: letter. *Medical Journal of Australia*, 2010. **192**(10): p. 602.
 35. National Health Priority Action Council, *National chronic disease strategy*, 2006, Australian Government Department of Health and Ageing: Canberra.
 36. Northern Territory Department of Health, *Remote health atlas: rheumatic heart disease program*, 2007, Department of Health, Northern Territory: Darwin.
 37. Australian Department of Health and Ageing. *Medical Specialist Outreach Assistance Program*. 2008 23 July 2008; Available from: <http://www.health.gov.au/internet/ctg/publishing.nsf/Content/MSOAP-Indigenous-Chronic-Disease-Policy-Framework>.
 38. Australian Department of Health and Ageing, *Australian Government 2011-12 Health and Ageing portfolio budget statements: Indigenous health: outcome 8*, 2011, Department of Health and Ageing, Australia: Canberra.
 39. Coory, M.D. and W.F. Walsh, *Rates of percutaneous coronary interventions and bypass surgery after acute myocardial infarction in Indigenous patients*. *Medical Journal of Australia*, 2005. **182**(10): p. 507-512.
 40. Hayman, N.E., et al., *Strengthening cardiac rehabilitation and secondary prevention for Aboriginal and Torres Strait Islander peoples [editorial]*. *Medical Journal of Australia*, 2006. **184**(10): p. 485-486.



Australian Indigenous HealthInfoNet

The Australian Indigenous HealthInfoNet is an innovative Internet resource that contributes to 'closing the gap' in health between Indigenous and other Australians by informing practice and policy in Indigenous health.

Two concepts underpin the HealthInfoNet's work. The first is evidence-informed decision-making, whereby practitioners and policy-makers have access to the best available research and other information. This concept is linked with that of translational research (TR), which involves making research and other information available in a form that has immediate, practical utility. Implementation of these two concepts involves synthesis, exchange and ethical application of knowledge through ongoing interaction with key stakeholders.

The HealthInfoNet's work in TR at a population-health level, in which it is at the forefront internationally, addresses the knowledge needs of a wide range of potential users, including policy-makers, health service providers, program managers, clinicians, Indigenous health workers, and other health professionals. The HealthInfoNet also provides easy-to-read and summarised material for students and the general community.

The HealthInfoNet encourages and supports information-sharing among practitioners, policy-makers and others working to improve Indigenous health – its free on line yarning places enable people across the country to share information, knowledge and experience. The HealthInfoNet is funded mainly by the Australian Department of Health and Ageing. Its award-winning web resource (www.healthinfonet.ecu.edu.au) is free and available to everyone.

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FEATURED ARTWORK

Ceremonial grounds

by Jimmy Njamme Tjampitjin

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