



6.7 Size and sources of the Indigenous health gap

Employment and hours worked, household income, educational attainment and whether a person smokes explain most of the differences in health outcomes between Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians.

Indigenous Australians, on average, have worse health than non-Indigenous Australians. Some measures have improved—for instance, there has been a significant decrease in mortality rates since the late 1990s, and a reduction in smoking since the early 2000s (AHMAC 2017; PM&C 2018). But on many measures, large disparities remain in health outcomes between Indigenous and non-Indigenous Australians. This is referred to as the 'health gap'.

The extent of the health gap has been increasingly well documented. Understanding continues to grow about the many and complex factors that can influence and contribute to it (AHMAC 2017; AIHW 2014b:329–39; see also chapters 6.5 'Health behaviours of Indigenous Australians', 6.6 'Social determinants and Indigenous health').

A person's health is influenced by their home, school, workplace, community and experiences of social institutions and systems (CSDH 2008). Much of the understanding of the health gap is based on observed differences between Indigenous Australians and non-Indigenous Australians of factors widely recognised as key determinants of good health (Biddle 2012; Mackenbach 2015; Marmot 2011; Shepherd et al. 2012). These differences include those in:

- social determinants of health: Indigenous Australians, on average, have lower levels of education, employment, income, and poorer quality housing than non-Indigenous Australians (AHMAC 2017; AIHW 2017)
- health risk factors: Indigenous Australians, on average, have higher rates of smoking and risky alcohol consumption, do less exercise, and have a greater risk of high blood pressure than non-Indigenous Australians (AHMAC 2017; AIHW 2017)
- access to appropriate health services: Indigenous Australians are more likely than non-Indigenous Australians to report difficulty in accessing affordable health services that are close by (AIHW 2015).

This article quantifies the main factors that contribute to the Indigenous health gap and offers a renewed opportunity to focus on policies and programs to reduce it. Solutions need to be directed to dealing with the underlying causes of poor health among Indigenous Australians throughout their lives.

The Council of Australian Governments has a number of Closing the Gap targets that aim to reduce differences in key areas between Indigenous and non-Indigenous Australians. Two of these focus on important measures of health status—life expectancy and child mortality. Currently, Indigenous Australians can be expected to live about 10 years less than non-Indigenous Australians, and Indigenous babies and children are twice as likely to die as their non-Indigenous counterparts (see Chapter 6.3 'Indigenous child mortality and life expectancy').



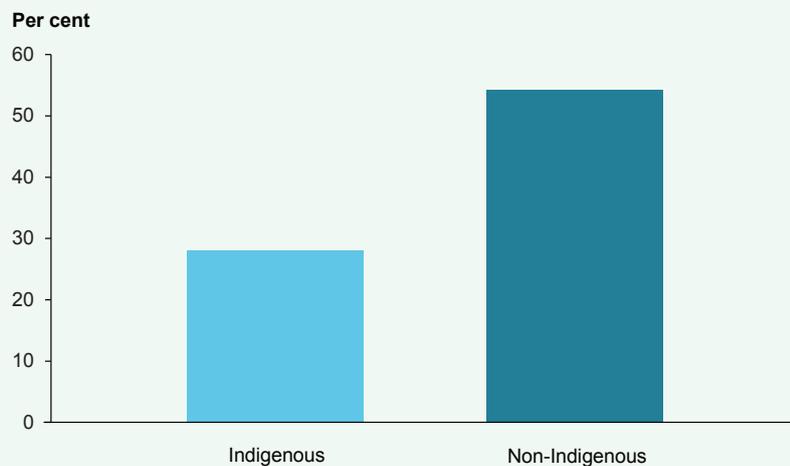
The health gap: fewer Indigenous Australians are in 'good health'

This article examines the difference in the percentage of Indigenous and non-Indigenous adults assessed to be in 'good health', based on a composite measure of 'good health' described below and in Box 6.7.1. This gap is different from other health gaps that may be mentioned—for example, when discussing differences in life expectancy or mortality (see Chapter 6.3 'Indigenous child mortality and life expectancy') or burden of disease studies (AIHW 2016a).

In 2011–13, just under 3 in 10 (28%) Indigenous adults aged 15–64 were assessed to be in good health, compared with more than 5 in 10 (54%) non-Indigenous adults in this age group—a gap of 26 percentage points (Figure 6.7.1). After accounting for the small effects of differences in age, gender and location, this produces an adjusted health gap of nearly 27 percentage points.

This article explores how this gap arises and estimates the extent to which different social determinants and health risk factors contribute to this 27-percentage point gap (as adjusted).

Figure 6.7.1: Proportion of people aged 15–64 assessed to be in good health, by Indigenous status, 2011–13



Sources: AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S6.7.1.



How is 'good health' measured?

The measure of 'good health' used in this analysis has three components:

1. self-assessed health status
2. self-reported selected long-term health conditions (morbidity score)
3. emotional wellbeing, reflecting a person's self-reported level of distress (emotional distress score).

This combination is consistent with the World Health Organization's view of good health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO 1948). The level of good health on each of these three components is shown in Figure 6.7.2.

A person is in 'good health' if they have a score of 3.0 or more on the composite measure (the calculation of the composite good health score is further explained in Box 6.7.1).

Box 6.7.1: The composite 'good health' measure

The level of self-assessed health status in both the 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey (AATSIHS) and 2011–12 Australian Health Survey (AHS) is reported in five categories. For this analysis, these categories were assigned a score from 5 to 1, corresponding to 'excellent', 'very good', 'good', 'fair' and 'poor', respectively.

The morbidity score is based on the widely used Charlson Index (Charlson et al. 1987). It sums the number of conditions reported by a respondent but ignores the weighting factor usually associated with the severity of the condition (which was not reported in these surveys). The conditions used to generate this morbidity score include cancer; and conditions of the circulatory, respiratory, nervous, endocrine, urinary and musculoskeletal systems. The morbidity score ranged from 0 to 21.

The emotional distress score was calculated as the sum of 5 individual Kessler-5 scores, measuring how often respondents reported feeling nervous, without hope, restless or jumpy, 'everything was an effort', and 'so sad that nothing could cheer them up', in the 4 weeks before the survey. The score for each response was scaled from 0 (none of the time) to 4 (all the time), and summed over the 5 responses, resulting in emotional distress scores that ranged from 0 to 20.

The composite health score for an individual was then calculated as follows:

$$\text{composite score} = \text{self-assessed health score} - \text{morbidity score} - \left(\frac{\text{emotional distress score} - 2}{2} \right)$$

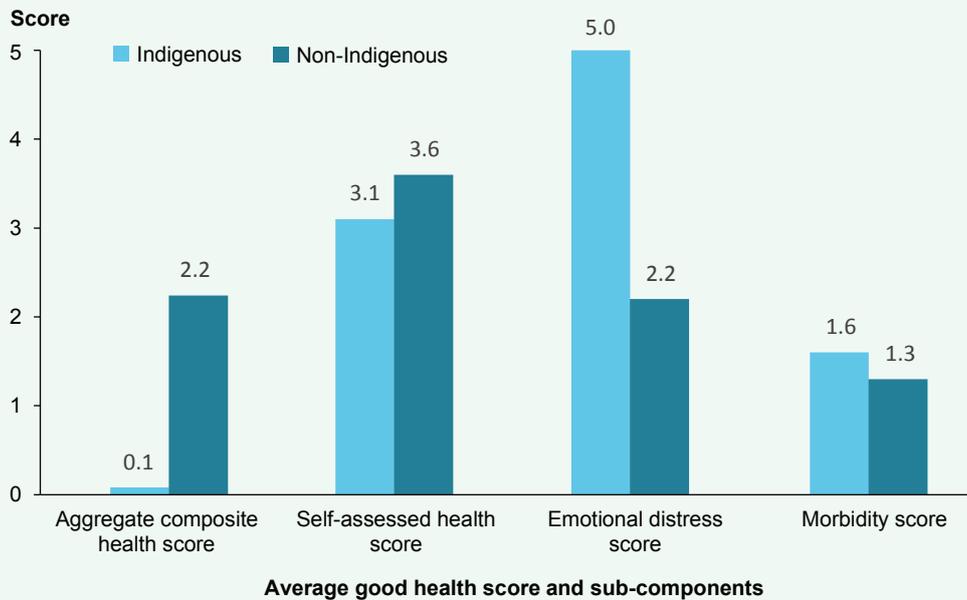
For this analysis, a person was considered to be in good health if their score was 3.0 or higher. If they scored less than 3.0, they were considered not to be in good health. Applying a cut-off score simplifies the analysis because it creates an outcome with two possibilities: 'good health' or 'not in good health'. The chosen cut-off value of 3.0 is consistent with that of a previous AIHW (2014b:329–39) analysis.

The largest gap in the three components of the composite good health score occurs for the emotional distress score. The average emotional distress score for Indigenous adults is 5.0 while it is only 2.2 for non-Indigenous adults. The mean value of the composite health score is 0.1 for Indigenous adults and 2.2 for non-Indigenous adults (Figure 6.7.2).





Figure 6.7.2: Average score for aggregate composite health and sub-components, by Indigenous status, 2011–13



Note: These average scores are based on the actual sample of individuals used in the regression models estimated; hence, they may not be representative of the overall population of people aged 15–64 in these two surveys. Given the large number of explanatory variables used, individuals for whom any of the regression variables were missing are excluded from the estimation sample from which these average values are computed.

Sources: AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S6.7.1.

The proportion of people in good health on the composite measure was calculated using data from the Australian Bureau of Statistics (ABS) 2012–13 AATSIHS for Indigenous Australians. Comparable non-Indigenous data were sourced from the ABS 2011–12 AHS. Both surveys contain detailed information on people’s health outcomes and on their social determinants and health risk factors (ABS 2013, 2014).

The final sample of individuals for this analysis consisted of around 3,180 Indigenous and 8,150 non-Indigenous working-age adults (aged 15–64). This age group was chosen because some key determinants of health used in the analysis, such as hours worked, are best defined for people who have not reached the standard retirement age.

More recent AHS data are now available, but the next round of the Indigenous-specific health survey is only being conducted this year. Hence, this article uses the 2012–13 AATSIHS and 2011–12 AHS.



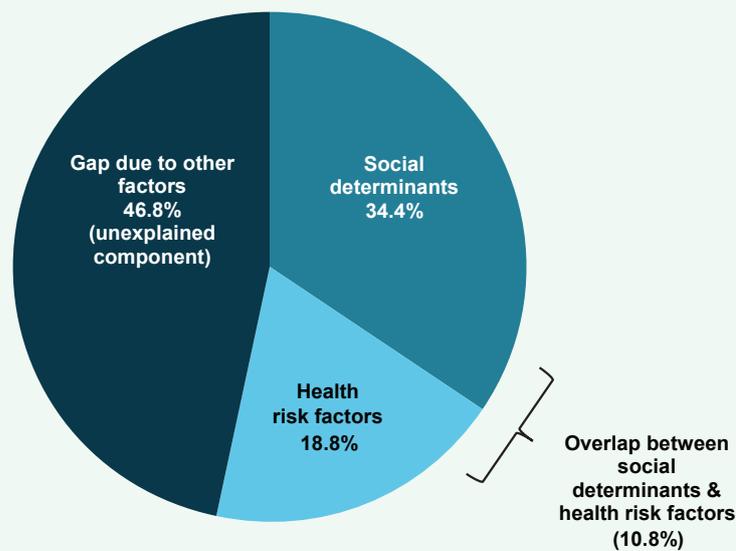
More than half the gap is explained by 11 factors

Statistical analysis was used to see which factors were highly associated with good health. The results show that more than half of the health gap (53%) is explained by 11 selected factors (Figure 6.7.3). These factors were broadly classified into two groups: social determinants (5) and health risk factors (6).

Social determinants	Health risk factors
• Employment and hours worked	• Binge drinking
• Highest non-school qualification	• High blood pressure
• Level of school completed	• Overweight and obesity status (body mass index)
• Housing adequacy (sufficient number of rooms)	• Inadequate fruit and vegetable consumption
• Household income	• Insufficient physical exercise
	• Smoking

The combined social determinants explain slightly more than one-third (34%) of the health gap and the selected health risk factors account for another 19%.

Figure 6.7.3: Proportion of the adjusted health gap explained by differences in social determinants and health risk factors between Indigenous and non-Indigenous Australians, 2011–13



Sources: AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S6.7.2.



An estimated 11% of the total health gap can be attributed to the overlap, or interactions, between the social determinants and health risk factors. This is because the two sets of factors influence each other—their combined total contribution to the gap is less than the sum of their separate contributions. See chapter 6.6 'Social determinants and Indigenous health', which explores an example of these interactions—between smoking status and household income and education.

For more information see supplementary document S6.7 'Method for estimating the sources of the health gap' available online at <www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material>.

Tackling the different factors would reduce the gap

The analysis indicates that the adjusted health gap would be reduced from 27 percentage points to 13, if Indigenous working-age adults had the same average values for the 11 selected factors as non-Indigenous working-age adults. Most of the 14-percentage point reduction would come from social determinants (9 percentage points), with a 5-percentage point reduction due to health risk factors.

Another way to look at this result is this: 42% of Indigenous working-age adults would have been assessed as being in good health if they had had the same average values as non-Indigenous adults for the 11 selected factors (and the demographic and locational factors). This figure is well above the 28% of Indigenous adults in good health from the current survey results (shown in Figure 6.7.1).

Nearly half the gap is not explained by the selected factors

While differences between Indigenous and non-Indigenous Australians across the 11 factors explain 53% of the gap, around 47% is left unexplained.

This unexplained component of the health gap partly reflects the possible effects of factors that contribute to good health but which were not able to be included in the statistical analyses, such as access to health care services. Improving access to health care services relative to need is of crucial importance for better Indigenous health outcomes (AHMAC 2017; AIHW 2014a, 2015); but this aspect could not be measured by the current survey data.

This analysis is based only on relationships between health status at one point in time (2011–13) and the social determinants and health risk factors. It does not account for the cumulative effects of any early life events on current health, or the effects of different social determinants and health risk factors that applied at other points in time. These effects will also be part of the unexplained component of the health gap, along with the effects of other factors that are intrinsically difficult to measure in a survey that records information at one point in time.

One part of the unexplained component of the health gap, however, will also reflect the effects of other disadvantages on health outcomes that occur due to the marginal position of Indigenous Australians in relation to mainstream society (Marmot 2011).





Social determinants have the greatest effect on the health gap

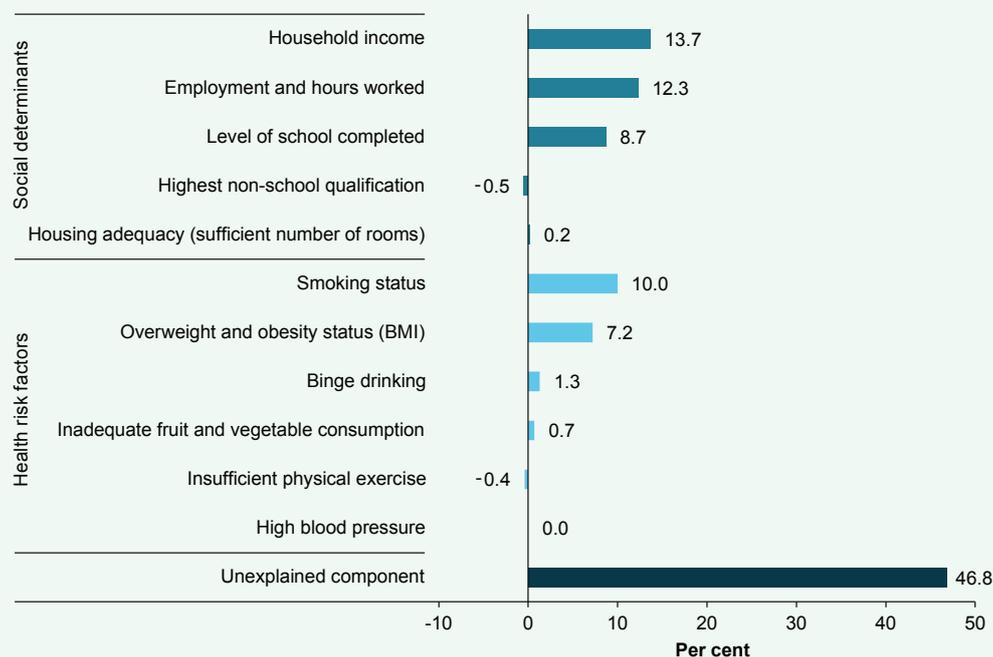
Household income differences contributed almost 14% of the overall health gap, followed by differences in employment and hours worked (12%), and level of school completed (8.7%) (Figure 6.7.4).

Among the health risk factors, differences in smoking status made the greatest contribution to the health gap, at 10%, followed by overweight and obesity status (7.2%).

Together, household income, employment/hours worked and smoking status account for 36% of the total health gap, which is more than two-thirds (68%) of the total contribution made by the 11 selected factors.

If Indigenous adults were to have the same average levels as non-Indigenous adults of just these three factors (that is, same household income, same employment rate and hours worked, and same smoking rate), the health gap would be reduced by more than a third—from 27 percentage points to around 17 percentage points.

Figure 6.7.4: Contribution of individual social determinants and health risk factors to the adjusted health gap between Indigenous and non-Indigenous Australians, 2011–13



Note: The contribution of a variable to the gap can be either positive or negative. A positive contribution means that the predicted gap would be lower than the actual gap if the two subgroups had the same levels of that explanatory variable. A negative contribution means that the predicted gap would be higher than the actual gap if the two subgroups had the same levels of that explanatory variable. A negative contribution also helps to 'explain' the gap in the sense that, were it not for the differences observed on that variable, the actual health gap would have been higher. The two negative contributions shown in this graph, however, are small and not significantly different from zero.

Sources: AIHW analyses of ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, ABS 2011–12 Australian Health Survey; Table S7.6.2.



How do the key factors affect good health?

This section focuses on the five factors that contribute to most (98%) of the explained health gap between Indigenous and non-Indigenous adults in this analysis:

1. household income (equivalised by household size)
2. employment and hours worked
3. smoking status
4. level of school completed
5. overweight and obesity status.

It presents the results of statistical analysis on how much the presence (or absence) of these factors affects a person's chance of being in good health. These results are the first steps from which the contributions to the gaps were estimated. The analysis was carried out separately for the sample of Indigenous and non-Indigenous adults, and this section also highlights differences in results between the two groups.

The analysis estimated an odds ratio (OR) of a person being in good health for each factor—that is, the odds that a person would be in good health if they were exposed to a specific factor (for example, if they were a current smoker) compared with the odds of being in good health if they were not exposed to that factor (not smoking).

How the value of the estimated OR should be interpreted for each factor is outlined below.

An OR value of...	means...
1 (or close to 1)	the factor has little or no effect on the odds of being in good health, compared with a person in the reference group.
Greater than 1	the factor increases the odds of being in good health, compared with a person in the reference group. This implies a positive association between that factor and the good health measure.
Less than 1	the factor decreases the odds of being in good health, compared with a person in the reference group (a negative association between the factor and the good health measure).

Note that the odds of being in good health is not exactly the same as the likelihood (or probability) of being in good health. However, these concepts are directly related, and a factor that leads to increased odds also increases the likelihood.

For more information see supplementary document S6.7 'Method for estimating the sources of the health gap' available online at <www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material>.





Focusing on aspects of each factor that increases the odds that someone will be in good health may offer a more targeted approach to reducing the health gap.

For some factors described in the sections that follow, the same factor significantly increases the odds of being in good health for non-Indigenous adults, but not for Indigenous adults. This may be an effect of the statistical model (considering the smaller Indigenous sample size, and inherently more non-Indigenous adults than Indigenous adults in 'good health' in the reference categories used to calculate the ORs). However, some of these differences in the estimated results form part of the unexplained component of the health gap.

The results on the estimated ORs for these selected five variables are shown in Figure 6.7.5, and summarised in the following sections.

Employment and household income

Being employed and working for at least 25 hours a week with a higher income have positive effects on a person's health status.

Both Indigenous and non-Indigenous adults have significantly increased odds of being in good health—by a factor of at least 1.5—if they:

- work in paid employment for at least 25 hours each week
- have a household income in the top 30% of all households (when all household incomes are ranked from highest to lowest).

Employed non-Indigenous adults have significantly increased odds of being in good health—even if they work in paid employment for fewer than 25 hours each week—compared with non-Indigenous people who are not employed. For Indigenous adults, the health benefits of being employed are observed only for people who work more than 25 hours a week, compared with not working at all.

There is a similar pattern for people who earn a mid-range income—that is, in the middle 40% of all households when income is ranked from highest to lowest—compared with people whose incomes are in the lowest 30%. Earning a mid-range income (middle 40%) significantly increases the odds of being in good health for non-Indigenous adults only. For Indigenous adults, a significant effect of income in improving health is seen only for people in the top 30% of all households.

Smoking status

Being a current smoker (compared with not smoking) reduces the odds of being in good health (1.5 times less likely) for both Indigenous and non-Indigenous adults.





Level of school completed

Both Indigenous and non-Indigenous adults who have completed a higher level of secondary schooling have greater odds of being in good health.

For Indigenous adults, a higher level of schooling significantly increases the odds of a person being in good health *only* if they have completed Year 12 (compared with the reference category of having completed Year 9 or below). That is, for Indigenous adults who have completed Year 10 or 11, there is little or no increase in their odds of being in good health, compared with people who have completed Year 9 or below.

Non-Indigenous adults have significantly increased odds that they will be in good health if they have completed any year of schooling above Year 9.

Overweight and obesity status

Being obese (a body mass index, or BMI, ≥ 30.00) significantly reduces the odds of being in good health, compared with adults in the normal weight range (BMI 18.50–24.99).

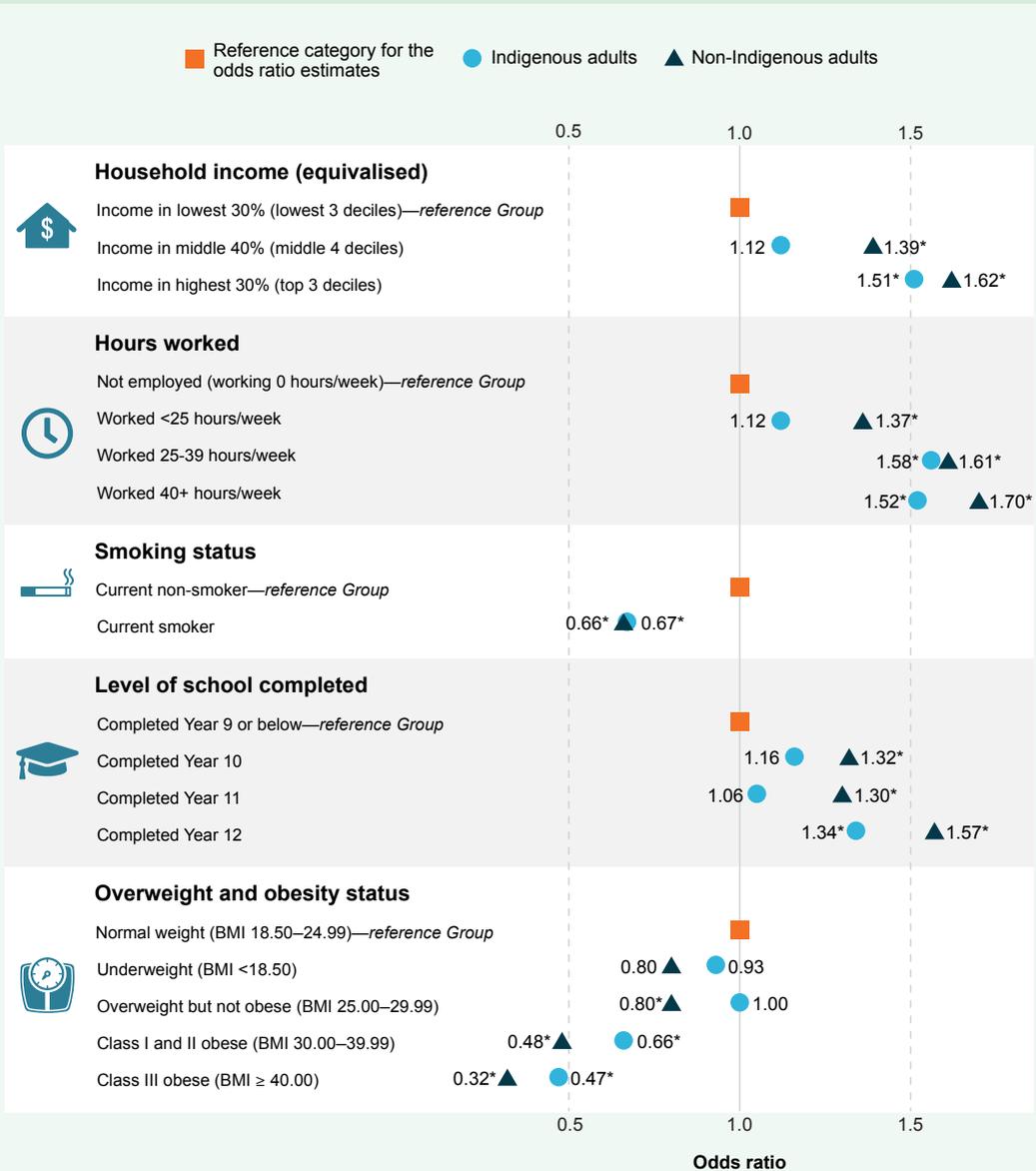
In the class III obese category (BMI ≥ 40.00), the odds of being in good health are more than 3 times lower among non-Indigenous adults, and more than 2 times lower for Indigenous adults, compared with adults in the normal weight range.

Being in the overweight but not obese range (BMI 25.00–29.99) significantly reduces the odds of being in good health (compared with people in the normal weight range; BMI 18.50–24.99), but only for non-Indigenous adults. For Indigenous adults, there are no significant differences in the odds of being in good health, whether they are in the normal or overweight but not obese BMI ranges (18.50–24.99; 25.00–29.99).





Figure 6.7.5: Estimated odds ratios for being in good health, by Indigenous status, 2011–13



* Estimated odds ratio (OR) are statistically different from 1 at the conventional 5% test level. The actual estimated value then indicates whether this estimate is significantly higher than 1 or significantly lower than 1. No asterisk means the estimated OR is not significantly different from 1 (meaning the odds of being in good health does not vary significantly between the designated category and the baseline or reference category for that factor).

Sources: AIHW analyses of ABS Australian Aboriginal and Torres Strait Islander Health Survey 2012–13, ABS 2011–12 Australian Health Survey.



What does this mean?

These results illustrate the usefulness of looking behind the aggregate health gap to identify the key differences or sources that lead to the gap. The findings identify the most effective areas to target to reduce the health disparities between Indigenous and non-Indigenous Australians.

This sort of analysis shows how targeted policies can play a role in reducing health disparities. Considering the five factors that contribute most to the explained health gap—and the significantly increased odds of being in good health achieved through particular outcomes—health disparities could be reduced through policies that facilitate, for example, Indigenous Australians completing Year 12, being employed with close to full-time hours of work, not smoking, and maintaining a healthy weight.

The analysis also shows that improvements in one area, such as higher educational attainment, can also indirectly improve health outcomes by affecting other key factors, such as not smoking and working longer hours (which are associated with higher educational attainment).

What is the AIHW doing?

The AIHW has a long history of monitoring and reporting on Indigenous health and socioeconomic outcomes, and the gaps observed between the Indigenous and non-Indigenous populations.

The AIHW prepares the detailed online tables for the biannual *Aboriginal and Torres Strait Islander Health Performance Framework* report, which provides the latest information on how Indigenous Australians are faring according to a wide range of health performance measures. The AIHW also has a regular publication series titled *The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples*.

The AIHW has undertaken technical analyses of the sources of the Indigenous health gap on other indicators, including life expectancy (AIHW 2016b:234–41); on the incidence of low birthweight babies using data from the National Perinatal Minimum Data set (AIHW 2017); and on the burden of disease (AIHW 2016a).

What is missing from the picture?

It is likely that differences in access to affordable and nearby health services explain some proportion of the health gap between the Indigenous and non-Indigenous populations. That aspect, however, was not covered in this analysis. The topic is explored in chapter 6.8 'Indigenous Australians' access to and use of health services'. It could not be used in this analysis of the sources of the gap because data on similar types of access measures were not available from the surveys used for both Indigenous and non-Indigenous populations.





The analysis in this chapter is based on detailed health-related data from nationally representative and well-regarded surveys conducted by the ABS. However, the variables used to create the 'good health' measure at the centre of this analysis are derived from self-assessed/self-reported data. There are some known limitations of self-reported data in providing an accurate picture of objective health—analysis of self-reported measures alone may not be enough to inform health policy. The analysis could be extended with additional measures of the Indigenous health gap, reflecting objective health status.

Also, the data used for this analysis are from cross-sectional surveys that record point-in-time information. They ignore the potentially strong cumulative effects on current health, and social determinants and health risk factors, arising from early life events.

As well, this analysis looked only at the gap in health status of working-age adults (aged 15–64). Results may differ for other age groups.

Neither did this analysis consider any cultural determinants of health for Indigenous Australians. There is growing recognition that cultural determinants are important for Indigenous health, as a strong connection to culture is correlated with good health through strengthened identity, resilience and wellbeing (Department of Health 2017).

Where do I go for more information?

More information about the main contributors to the Indigenous life expectancy gap can be found in Chapter 5.8 in *Australia's health 2016*.

More information on the previous analysis of the sources of the health gap can be found in Chapter 7.8 of *Australia's health 2014*.

More information on geographical variation in Indigenous people's access to primary health care services relative to need is available in the report *Access to primary health care relative to need for Indigenous Australians*.

More information on the Aboriginal and Torres Strait Islander Health Performance Framework is available at: <www.aihw.gov.au/reports/indigenous-health-welfare/health-performance-framework/contents/summary>.

See also supplementary document S6.7 'Method for estimating the sources of the health gap' available online at <www.aihw.gov.au/reports/australias-health/australias-health-2018/related-material>.

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