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Determinants of the gap in health and wellbeing between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults who live in the Australian state of Victoria – the contribution of the social determinants of health

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Abstract

Background: For almost every measure of health, Aboriginal and Torres Strait Islander Australians have poorer outcomes than their non-Aboriginal and Torres Strait Islander counterparts. In colloquial terms this is referred to as ‘the gap’. According to the World Health Organization, it is the social determinants of health that are largely responsible for inequalities in health across populations. Yet the government ‘Closing the Gap’ strategy that seeks to eliminate the gap, almost exclusively focuses on the behaviours of individuals that may pose a risk to health.

Aim: The aims of this thesis are to investigate the social determinants of the health of Aboriginal and Torres Strait Islander adults who live in Victoria and to determine the relative contribution of selected social determinants compared with behavioural risk factors to the gap in health.

Methods: The data sources used were the 2008, 2011, 2012, and 2014 Victorian Population Health Surveys (VPHS), which are an unusually rich source of data of the social determinants of health. The VPHS is an annual computer-assisted telephone survey population-representative survey of adults aged 18 years and older, conducted by the Victorian State Government.

Prevalence ratios were calculated using generalised linear models to identify and compare the prevalence of social determinants between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults in the Victorian population. Multivariable logistic regression was used to further investigate and quantify the relative impacts of selected social determinants on the gap in health.

Results: Aboriginal and Torres Strait Islander adults disproportionately experienced food insecurity, psychological distress, and racism and these were identified as key social determinants. A risk factor analysis showed that experiences of racism made the largest contribution to the gap in self-reported health status explaining 34% of the gap, followed by smoking (32%), unhealthy bodyweight (20%), socioeconomic status (total annual household income) (15%), excessive alcohol consumption (13%), and abstinence from alcohol consumption (13%). Together racism and smoking explained 58% of the gap, suggesting that the contribution of racism to the gap was largely independent of smoking.

Conclusions: It is hypothesized that psychological distress may be a pathway by which the social determinants of food insecurity and experiences of racism negatively impact on health. Given that racism is an underlying and unifying theme for most of the social determinants of Aboriginal and Torres Strait Islander health, it is also hypothesised that racism is the pivotal social determinant, that acts at multiple points, distally and proximally, along the causal pathway. Consequently, a conceptual model of the gap in Aboriginal and Torres Strait Islander health and wellbeing is proposed.

With the possible single exception of Victoria, government action across Australia to address the gap remains top-down and non-collaborative, based on a deficit discourse that sees Aboriginal and Torres Strait Islander peoples and their behaviours as the cause of the problem. Therefore, the implications of these findings for government policy-making are a significant departure from the thinking that informed the policy solutions of the Closing the Gap strategy.

Declaration

This thesis is an original work of my research and contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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Publications during enrolment

1. Markwick, A., Ansari, Z., Sullivan, M., Parsons, L., McNeil, J. 2014. Inequalities in the social determinants of health of Aboriginal and Torres Strait Islander People: a cross-sectional population-based study in the Australian state of Victoria. International Journal for Equity in Health **13**; 91–103.
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Thesis including published works declaration

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes 5 original papers published in peer reviewed journals and 0 submitted publications. The core theme of the thesis is the social determinants of the gap in Aboriginal and Torres Strait Islander health and wellbeing. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the Department of Epidemiology and Preventive Medicine under the supervision of Professor John McNeil.

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of chapters 3, 4, 5, 6, and 7, my contribution to the work involved the following:

Thesis Chapter	Publication Title	Status (published, in press, accepted or returned for revision, submitted)	Nature and % of student contribution	Co-author name(s) Nature and % of Co-author's contribution*	Co-author(s), Monash student Y/N*
3	Inequalities in the social determinants of health of Aboriginal and Torres Strait Islander People: a cross-sectional population-based study in the Australian state of Victoria	Published	Concept, analysis of data and writing first draft: 70%	1) Zahid Ansari: input into manuscript 10% 2) Mary Sullivan: input into manuscript: 5% 3) Lorraine Parsons: input into manuscript 5% 4) John McNeil: input into manuscript 10%	No
4	Social determinants and lifestyle risk factors only partially explain the higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders in the Australian state of Victoria: a cross-sectional study	Published	Concept, analysis of data and writing first draft: 75%	1) Zahid Ansari: input into manuscript 10% 2) Mary Sullivan: input into manuscript: 5% 3) John McNeil: input into manuscript 10%	No
5	Social determinants and psychological distress among Aboriginal and Torres Islander adults in the Australian state of	Published	Concept, analysis of data and writing first draft: 65%	1) Zahid Ansari: concept and input into manuscript 20% 2) Mary Sullivan: input into manuscript: 5%	No

	Victoria: a cross-sectional population based study.			3) John McNeil: input into manuscript 10%	
6	Experiences of racism among Aboriginal and Torres Strait Islander adults living in the Australian state of Victoria: a cross-sectional population-based study	Published	Concept, analysis of data and writing first draft: 70%	1) Zahid Ansari: concept and input into manuscript 10% 2) Darren Clinch: input into manuscript: 10% 3) John McNeil: input into manuscript 10%	No
7	Perceived racism may partially explain the gap in health between Aboriginal and non-Aboriginal Victorians: A cross-sectional population based study	Published	Concept, analysis of data and writing first draft: 70%	1) Zahid Ansari: concept and input into manuscript 10% 2) Darren Clinch: input into manuscript: 10% 3) John McNeil: input into manuscript 10%	No

I have not renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

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I hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author, I have consulted with the responsible author to agree on the respective contributions of the authors.

Main Supervisor name: Professor John McNeil

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Abbreviations

ABS = Australian Bureau of Statistics

AIHW = Australian Institute of Health and Welfare

ATSIC = Aboriginal and Torres Strait Islander and Torres Strait Islander Commission

95% CI = 95% confidence interval

CAEPR = Centre for Aboriginal Economic Policy Research

COAG = Council of Australian Governments

CRCAH = Cooperative Research Centre for Aboriginal Health

KHRD = Koori Health Research Database

LGA = local government area

LIH Birth Cohort = the Lying-In Hospital Birth Cohort

NATSIS = National Aboriginal and Torres Strait Islander Survey

NATSIHS = National Aboriginal and Torres Strait Islander Health Survey

NATSISS = National Aboriginal and Torres Strait Islander Social Survey

OR = Odds Ratio

PR = prevalence ratio

SES = socioeconomic status

VAAF = Victorian Aboriginal Affairs Framework

VPHS = Victorian Population Health Survey

WHO = World Health Organization

CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

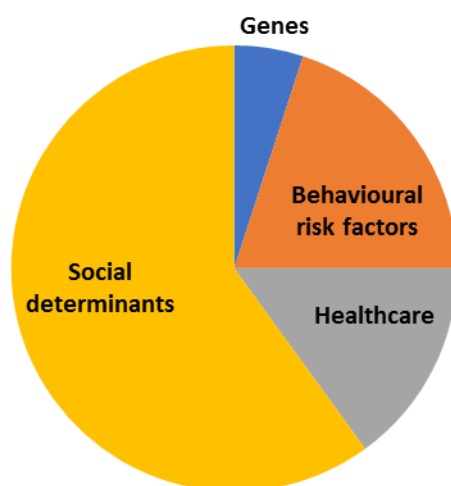
For almost every measure of health and wellbeing, Aboriginal and Torres Strait Islander Australians have poorer outcomes than their non-Aboriginal and Torres Strait Islander counterparts. In colloquial terms this is referred to as ‘the gap’. This thesis adds to the body of knowledge about the reasons for ‘the gap’, specifically focussing on Aboriginal and Torres Strait Islander peoples who live in the state of Victoria. To date, despite Australian governments in 2008 committing to eliminating the gap in life expectancy by 2031, almost no progress has been made (Commonwealth of Australia 2019).

1.1.1 Determinants of health

Health is determined by a complex interaction between genetic inheritance, behavioural risk factors (also known as health behaviours or lifestyle risk factors), access to quality and affordable healthcare, and the social determinants of health (Tarlov 1990).

Figure 1.1 shows the relative contribution of these determinants to health according to Tarlov (1999).

Figure 1.1 Determinants of health – modified from Tarlov 1999



It is the social determinants that make the largest impact on health, followed in descending order by behavioural risk factors, access to quality healthcare, and genetic inheritance.

1.1.2 The social determinants of health

The World Health Organization (WHO) defines the social determinants of health as: “the conditions, in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life” including the distribution of money, power and resources (World Health Organization 2008).

The 1990s saw a proliferation of research on the relationship between socioeconomic status and other social determinants with health (Braveman et al. 2011). Upon the publication of the second edition of a pivotal report by the WHO in 2003 on the social determinants of health, there was a sharp cumulative increase in the number of publications on the social determinants of health (Braveman et al. 2011) (World Health Organization 2008). The WHO report recognises 10 social determinants of health: the social gradient (socioeconomic status), stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport.

By 2008, a critical mass of knowledge had accumulated about the social determinants of health and the Commission on Social Determinants of Health (CSDH), convened by the WHO, released a long-awaited report (World Health Organization 2008). The report stated that: *“Social injustice is killing people on a grand scale”* and called for governments, civil society, and other organisations to begin addressing the social determinants of health in order to reduce health inequities. Health inequities are the unfair and avoidable differences in health status seen within and between countries (World Health Organization 2008).

Although the social determinants may make the greatest contribution to health, public health practice among high-income countries continues to place the primary focus on the behaviours of individuals that pose a risk to health—the behavioural risk factors (Baum 2011). This may be partly due to the domination of the biomedical model of health in guiding modern clinical medicine and epidemiology (Ansari et al. 2003).

1.1.3 The biomedical model of health

The biomedical model of health attributes disease to proximate biological factors at the level of the individual, and largely ignores the psychological, social, cultural, economic, and environmental causes of ill-health (Johnson 2013).

The biomedical model of health is based on four assumptions: (1) absence of disease is health; (2) removal or attenuation of the disease will restore health; (3) mental and emotional conditions are separate from and unrelated to physical conditions; (4) there is a single cause of disease (Wade et al. 2004) (Broadbent 2009).

The first and second assumptions that absence of disease is health was rejected by the WHO in 1948, who incorporated a new definition of health into their constitution that states: *“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”* (World Health Organization 2008).

The biomedical definition of health also contrasts with, and ignores, the Aboriginal and Torres Strait Islander conception of health as being *“Not just the physical well-being of the individual but the social, emotional and cultural well-being of the whole community.”* (National Aboriginal Health Strategy Working Party 1989).

The third assumption that mental and emotional conditions are separate from and unrelated to physical conditions has been soundly debunked by a wealth of literature from across the world, that continues to grow (Kiecolt-Glaser et al. 2002) (Mykletun et al. 2009).

The fourth assumption that there is a single cause of disease was based on a time when infectious diseases were the major cause of morbidity and mortality. However, today non-communicable chronic diseases are the major cause of morbidity and mortality in high-income countries, and they are rarely attributable to any single cause.

However, the influence of the monocausal explanation of disease can still be observed today where the focus of inquiry for non-communicable chronic diseases has become the behavioural risk factors—the health behaviours of individuals, particularly smoking, excessive consumption of alcohol, obesity, poor diet and inadequate physical activity (Baum and Fisher 2011) (Alvaro et al. 2010) (Brown 2013).

The policy and intervention implications of this are that chronic diseases can be prevented through the adoption of healthy behavioural choices, thereby committing the biomedical fallacy of inferring that disease in populations can be fully explained by risk factors for disease in individuals (Shy 1997).

1.1.4 Critique of the focus on behavioural risk factors

First, it is disproportionate. The current evidence suggests that the gains to be made by addressing the behavioural risk factors are smaller than the gains that would be made by addressing the social determinants of health (Tarlov 1999) (Braveman et al. 2011). For example, a risk factor analysis found that 29 risk factors, of which 27 were behavioural, explained only 31.5% of the total burden of disease and injury in Australia in 2011 (Australian Institute of Health and Welfare 2016).

Second, the focus on ‘behavioural risk factors’ is predicated on the assumption that all individuals in a society are equally free and able to ‘choose’ a healthy lifestyle. Therefore, those who engage in unhealthy behaviours are seen to be engaging in ‘morally irresponsible bad behaviour’ and are to be held accountable for their own ill-health (Brown 2013). This not only stigmatises those who engage in unhealthy behaviours but also shifts the focus of responsibility for health away from the government and private sector to the individual (Baum 2011) (Baum and Fisher 2011).

However, an individual may consume a diet that is nutritionally poor and obesogenic out of necessity not choice, because they lack the economic resources with which to purchase more expensive healthier dietary options, or they may smoke or take recreational drugs to cope with living in stressful and disadvantaged circumstances (Baum 2011). Therefore, by focusing on behavioural risk factors, health inequalities become entrenched and exacerbated because those further up the socioeconomic ladder have less stressful lives, more resources, and greater motivation to alter their behaviour (Baum and Fisher 2011).

Third, most health outcomes and behavioural risk factors follow a socioeconomic gradient where the lower the socioeconomic status the worse the health outcome and the greater the prevalence of behavioural risk factors. Therefore, if behavioural risk factors are the most important cause of poor health outcomes, one would predict that socioeconomic differences in health outcomes would be primarily explained by the higher prevalence of behavioural risk factors. However, studies that sought to explain socioeconomic differences in health outcomes by the higher prevalence of behavioural risk factors failed to do so (Lantz et al. 2001) (Cutler et al. 2011).

For example, a longitudinal study of a representative sample of adults (n = 3,617) in the United States, followed over 8 years, found that smoking, alcohol consumption, physical activity and body mass index explained only a modest portion of the socioeconomic differences in health (Lantz et al. 2001). The authors concluded that behavioural risk factors are not the dominant mediating mechanism of socioeconomic differences in health outcomes.

Finally, despite the vast amount of published literature in health promotion, there is little supporting evidence that health promotion interventions designed to promote behavioural change in individuals actually work. A Cochrane systematic review that evaluated the effectiveness of interventions to reduce behavioural risk factors concluded that the balance of evidence shows that health promotion interventions have met with limited success, and often modest improvements are not sustained in the long-term (Ebrahim et al. 2011).

1.1.5 What explains the gap in Aboriginal and Torres Strait Islander health?

Similar to research in the non-Aboriginal and Torres Strait Islander population, most of the research and policy focus in the Aboriginal and Torres Strait Islander population has been on the behavioural risk factors. The Australian Burden of Disease studies have been particularly influential in guiding public health practice to focus on the behavioural risk factors.

A study that is continually referred to, is a risk factor analysis conducted by Vos et al (2009). The authors estimated that 11 risk factors explained 49% of the gap in the burden of disease between Aboriginal and Torres Strait Islanders and non-Aboriginal and Torres Strait Islanders (Vos et al. 2009). The top three risk factors were smoking (17%), high body mass (16%), and physical inactivity (12%). Only behavioural risk factors were included in analysis.

According to Watts and Cairncross (2012), risk factor analysis is problematic, as the issue of what is or is not included in the analysis is not minor in terms of policy relevance (Watts and Cairncross 2012). They argued that if important risk factors are omitted, the importance of the risk factors that are included is over-inflated. Evidence to support this contention come from several studies that sought to expand risk factors analysis beyond behavioural risk factors.

For example, a risk factor analysis that included measures of socioeconomic status, found that between 42 and 54% of the life expectancy gap between Aboriginal and Torres Strait Islander

peoples and their non-Aboriginal and Torres Strait Islander counterparts living in the Northern Territory, was explained by socioeconomic status (Zhao et al. 2013). A further 14–24% of the gap was explained by smoking, 9–17% by obesity, and 1–7% by alcohol consumption. When three behavioural risk factors (smoking, alcohol abuse and obesity), two other risk factors (intimate partner violence and pollution) and socioeconomic status were included in the same analysis, they collectively explained 60–70% of the gap in life expectancy (Zhao et al. 2013).

Another study that sought to explain the gap in self-reported health status between Aboriginal and Torres Strait Islander peoples and their non-Aboriginal and Torres Strait Islander counterparts found that 33–50% of the gap could be explained by differences in income, employment status, and education (Booth and Carroll 2008).

More recently, the Australian Institute of Health and Welfare conducted a risk factor analysis using data from the 2004–05 National Aboriginal and Torres Strait Islander Survey and the National Health Survey (Australian Institute of Health and Welfare 2014). They used a composite measure of health that included: self-assessed health status; a morbidity score based on the Charlson Index of 29 conditions of the circulatory, respiratory, endocrine, nervous, urinary, and musculoskeletal systems; and emotional distress measured by the Kessler 5 Psychological Distress Scale. Socioeconomic status, measured by household income, education and employment status explained 31% of the health gap compared with 11% explained by the behavioural risk factors of smoking, body mass index and binge drinking, after adjusting for age, sex, remoteness, and marital status. Interactions between the behavioural risk factors and socioeconomic status explained another 15%, while together socioeconomic status and behavioural risk factors explained 57% of the health gap (Australian Institute of Health and Welfare 2014).

1.1.6 The social determinants of Aboriginal and Torres Strait Islander health

Although the studies described above show that the social determinants appear to explain more of the health gap than the behavioural risk factors, this has not necessarily translated into a greater focus on the social determinants of health.

To date there has been little work done to investigate how the social determinants of Aboriginal and Torres Strait Islander health impact on health and wellbeing. Moreover the National Health and Medical Research Council (NHMRC), which is Australia's peak body for supporting health and medical research, did not acknowledge the social determinants of health as a distinct research category until 2018, where, for the first time, one of the three high priority categories contained the terms 'social and cultural determinants of health' (National Health and Medical Research Council 2018).

The purpose of this thesis is to investigate the social determinants of Aboriginal and Torres Strait Islander health and wellbeing in the state of Victoria and to explore how these contribute to the gap in health and wellbeing between Aboriginal and Torres Strait Islander adults and their non-Aboriginal and Torres Strait Islander counterparts.

However, before commencing the literature review, it is important to understand the context within which this thesis is set. Therefore, what will follow will be a summary of the health status of Aboriginal and Torres Strait Islander Australians and their non-Aboriginal and Torres Strait Islander counterparts. This will then be followed by a description of the socio-demography of the Aboriginal and Torres Strait Islander Australians and Victorians.

1.2 The health and wellbeing of Aboriginal and Torres Strait Islander Australians

1.2.1 Life expectancy

Aboriginal and Torres Strait Islander males and females born in 2015-2017 can expect to live 8.6 and 7.8 years less than non-Aboriginal and Torres Strait Islander men and women, respectively (Australian Institute of Health and Welfare 2019a). Aboriginal and Torres Strait Islander Australians also have a significantly lower life expectancy than their indigenous counterparts in the comparable countries of Canada, New Zealand, and the United States of America (Hill et al. 2007).

However, while Canada, the United States of America and New Zealand have made significant progress in narrowing the gap in life expectancy between their indigenous and non-indigenous peoples, Australia has made no progress (King et al. 2009). For example, median age of death of indigenous peoples in Canada was 65, 59 in New Zealand, 63 in the United States of America, but only 51 in Australia (Ring and Brown 2002).

1.2.2 Infectious diseases

Australia is the only high-income country in the world where trachoma is endemic, found exclusively among Aboriginal Australians (Taylor 2001). Yet, trachoma, the leading infectious cause of blindness, is preventable. Poverty, overcrowding, and lack of access to a clean water supply and sanitation are ideal conditions for its transmission (Jung et al. 2014). Despite a resolution to eliminate trachoma worldwide by 2020 being adopted by the World Health Assembly in 1998, it was not until 2009 that the Australian government committed to eliminating trachoma in Australia (Jung et al. 2014). In contrast, the WHO has verified that low-income countries such as Ghana, Iran and most recently Nepal have all successfully eliminated trachoma (World Health Organization 2019).

Similarly, rheumatic heart disease is rare in high-income countries and is also preventable (Australian Institute of Health and Welfare 2013). It occurs when group A streptococcal bacterial infections are not treated. Like trachoma, rheumatic heart disease is a disease of poverty associated with overcrowding, poor hygiene, and poor sanitation. Almost all cases in Australia occur in the Aboriginal and Torres Strait Islander population.

Tuberculosis, another disease associated with poverty, is also over-represented among Aboriginal and Torres Strait Islander Australians. In 2007, the crude incidence rate of tuberculosis was 6.6 per 100,000 in Aboriginal and Torres Strait Islander Australians,

compared with only 0.9 per 100,000 in the Australian-born non-Aboriginal and Torres Strait Islander population (Robertus et al. 2011).

1.2.3 Non-communicable diseases

Overall, Aboriginal and Torres Strait Islander Australians experience a burden of disease that is 2.3 times the rate of non-Aboriginal and Torres Strait Islander Australians, with chronic (non-communicable) diseases accounting for almost two-thirds (64%) of the total disease burden (Australian Institute of Health and Welfare 2016). The disease group causing the most burden among Aboriginal and Torres Strait Islander Australians is mental and substance use disorders; 19% of total burden of disease. This includes depression and anxiety disorders, alcohol and drug use disorders, and autism spectrum disorders.

Injuries and suicide were responsible for 15% of the disease burden in Aboriginal and Torres Strait Islander Australians, followed by cardiovascular disease (12%), cancer (9%), respiratory diseases (8%), and musculoskeletal conditions (7%) (Australian Institute of Health and Welfare 2016).

Chronic diseases also accounted for 70% of the gap in disease burden between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Australians (Australian Institute of Health and Welfare 2016).

The causes responsible for the gap in decreasing order of contribution were: cardiovascular disease (19% of the gap), Injuries and suicide (15%), mental and substance use disorders (14%), cancer (9%), chronic kidney disease, diabetes, vision loss, hearing loss, and certain respiratory, musculoskeletal, neurological and congenital disorders (Australian Institute of Health and Welfare 2016).

Burden of disease estimates by state were reported for Aboriginal and Torres Strait Islander peoples who lived in New South Wales, Queensland, Western Australia and the Northern Territory, but not for those who lived in Victoria, South Australia, Tasmania or the Australian Capital Territory due to the small numbers of Aboriginal and Torres Strait Islander deaths in these jurisdictions (Australian Institute of Health and Welfare 2016).

However, data from the 2012-13 Australian Aboriginal and Torres Strait Islander Survey showed that 38.9% (95% confidence interval (CI): 35.4-42.4%) of Aboriginal and Torres Strait Islander Victorians had three or more long-term health conditions compared with 32.7% (31.2-34.2%) of Aboriginal and Torres Strait Islander Australians (Australian Bureau of Statistics 2013). This suggests that Aboriginal and Torres Strait Islander peoples who reside in Victoria may have worse health than Aboriginal and Torres Strait Islander Australians overall.

1.3 The socio-demography of Aboriginal and Torres Strait Islander Australians and Victorians

1.3.1 Australia

Contrary to common perception, Aboriginal and Torres Strait Islander Australians are a diverse group of peoples—as diverse as the peoples collectively described as ‘Europeans’. Prior to the arrival of Europeans in Australia, there were over 250 languages spoken, including 800 dialects (Australian Institute of Aboriginal and Torres Strait Islander Studies 2019). However, today only 13 languages are acquired by children and only approximately 100 languages are spoken to various degrees by older generations (Australian Institute of Aboriginal and Torres Strait Islander Studies 2019).

In the census year of 2016, it was estimated that there were 727,485 Australians who identified as Aboriginal, 38,660 who identified as Torres Strait Islander, and 32,220 who identified as both Aboriginal and Torres Strait Islander—collectively representing 3.3% of the total Australian population (Australian Bureau of Statistics 2016a).

The states of New South Wales and Queensland have the largest populations of Aboriginal and Torres Strait Islander peoples in absolute numbers, the Northern Territory has the highest density of Aboriginal and Torres Strait Islander peoples as a proportion of its population (30.3%), and Victoria has the lowest density of Aboriginal and Torres Strait Islander peoples (0.9%) (Australian Bureau of Statistics 2016a).

The Aboriginal and Torres Strait Islander population of Australia has a younger age structure than the non-Aboriginal and Torres Strait Islander population due to lower life expectancy and a higher birth rate (Australian Bureau of Statistics 2016a). The median age of an Aboriginal and Torres Strait Islander Australian in 2016 was 23.0 years compared with 37.8 years for non-Aboriginal and Torres Strait Islander Australians (Australian Bureau of Statistics 2016a).

While Aboriginal and Torres Strait Islander Australians are more likely to live in remote areas of Australia than non-Aboriginal and Torres Strait Islander Australians (18.6% vs. 1.5%), most Aboriginal and Torres Strait Islander Australians (81.4%) live in non-remote areas (Australian Bureau of Statistics 2016a). However, despite Aboriginal and Torres Strait Islander Australians being significantly more likely to live in urban areas, a bibliographic analysis of research publications on Aboriginal and Torres Strait Islander health identified through MEDLINE between 2004-2009, found that only 11% were conducted in urban populations (Eades et al. 2010).

1.3.2 Victoria

In 2016, the Australian Bureau of Statistics estimated that there were 57,767 Aboriginal and Torres Strait Islander peoples living in Victoria, constituting 7.2% of the total Aboriginal and Torres Strait Islander Australian population and 0.9% of the Victorian population. Victoria has

the lowest density of Aboriginal and Torres Strait Islander peoples compared with all other states and territories in Australia (Australian Bureau of Statistics 2016a).

Victoria also differs to the other states and territories in that the Aboriginal and Torres Strait Islander population is widely dispersed and there are only two discrete Aboriginal and Torres Strait Islander communities, Framlingham and Lake Tyers, both of which have very small populations of less than 150 people (Australian Bureau of Statistics 2016b). There are no very remote areas in Victoria.

The loss of more than half of the Aboriginal and Torres Strait Islander languages spoken in Australia following colonisation was disproportionate in both Victoria and Tasmania, where no Aboriginal and Torres Strait Islander languages are spoken today as the primary means of communication (Victorian Aboriginal Corporation for Languages 2019).

1.4 Aims of thesis

1. To identify inequalities in the health and wellbeing and the determinants of the health and wellbeing of Aboriginal and Torres Strait Islander adults, compared with their non-Aboriginal and Torres Strait Islander counterparts who live in the Australian state of Victoria.
2. To further investigate selected social determinants of note, based on the findings of the literature review and the findings of the study conducted to address the first aim.
3. To determine the relative contribution of selected social determinants and behavioural risk factors to the gap in health and wellbeing between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians.

Subsidiary aims:

4. To review governmental policy-making in relation to the health and wellbeing of Aboriginal and Torres Strait Islander Australians and Victorians.
5. To consider the potential policy implications of this thesis, including potential interventions and strategic directions.

1.5 Literature review

1.5.1 Search strategy

The literature was searched in English from 1999 to 2013 using the following electronic collections to obtain peer-reviewed publications: Ovid MEDLINE; PsycINFO; and CINAHL plus. Since much of the literature published on the health of Aboriginal and Torres Strait Islander Australians is grey literature in the form of government reports and discussion papers, the bibliographic database ATSIhealth was also searched. ATSIhealth indexes published and unpublished material in English on Aboriginal and Torres Strait Islander Australian health, compiled by the Australian Indigenous HealthInfoNet. Documents include theses,

unpublished articles, government reports, conference papers, abstracts, book chapters, books, discussion and working papers, and statistical documents.

The search terms and Boolean operators included were:

1. Indigenous OR Aborigin* OR Koori OR Koorie OR Torres*

AND

2. Social determinants OR social capital.

1.5.2 Inclusion and exclusion criteria

The inclusion and exclusion criteria used to decide which articles to include in the literature review were:

Inclusion criteria:

- In English and published between 1999 and 2013
- About Aboriginal and Torres Strait Islander peoples who lived in Victoria. This subsequently had to be expanded to all Aboriginal and Torres Strait Islander Australians because there were too few articles on Aboriginal and Torres Strait Islander peoples who lived in Victoria.

Exclusion criteria:

- About indigenous peoples of countries other than Australia
- Where the setting was a remote Aboriginal and Torres Strait Islander community as there are none in the state of Victoria
- Did not identify and include a specific health outcome or specific social determinant
- Not Aboriginal and Torres Strait Islander-specific—for example, where Aboriginal and Torres Strait Islander status was only used as a demographic variable
- Policy or intervention-related only
- Completely off-topic—for example, government reports on the provision of services.

1.5.3 Results of literature review

Figure 1.2 summarises the search results, where 657 publications were identified. Based on pre-specified inclusion and exclusion criteria, 635 were excluded, leaving 22 publications — two of which were books that extensively reviewed the literature on the social determinants of Aboriginal health in Australia up until 2007.

The first book was based on 16 papers generated by a workshop entitled ‘The Social Determinants of Aboriginal Health Workshop’, run by the Cooperative Research Centre for Aboriginal Health in Adelaide in 2004 (Anderson et al. 2007). The book entitled ‘Beyond band-aids: exploring the underlying social determinants of Aboriginal health’ was published in 2007, commissioned by the Cooperative Research Centre for Aboriginal Health as part of the development of its social determinants of health research program.

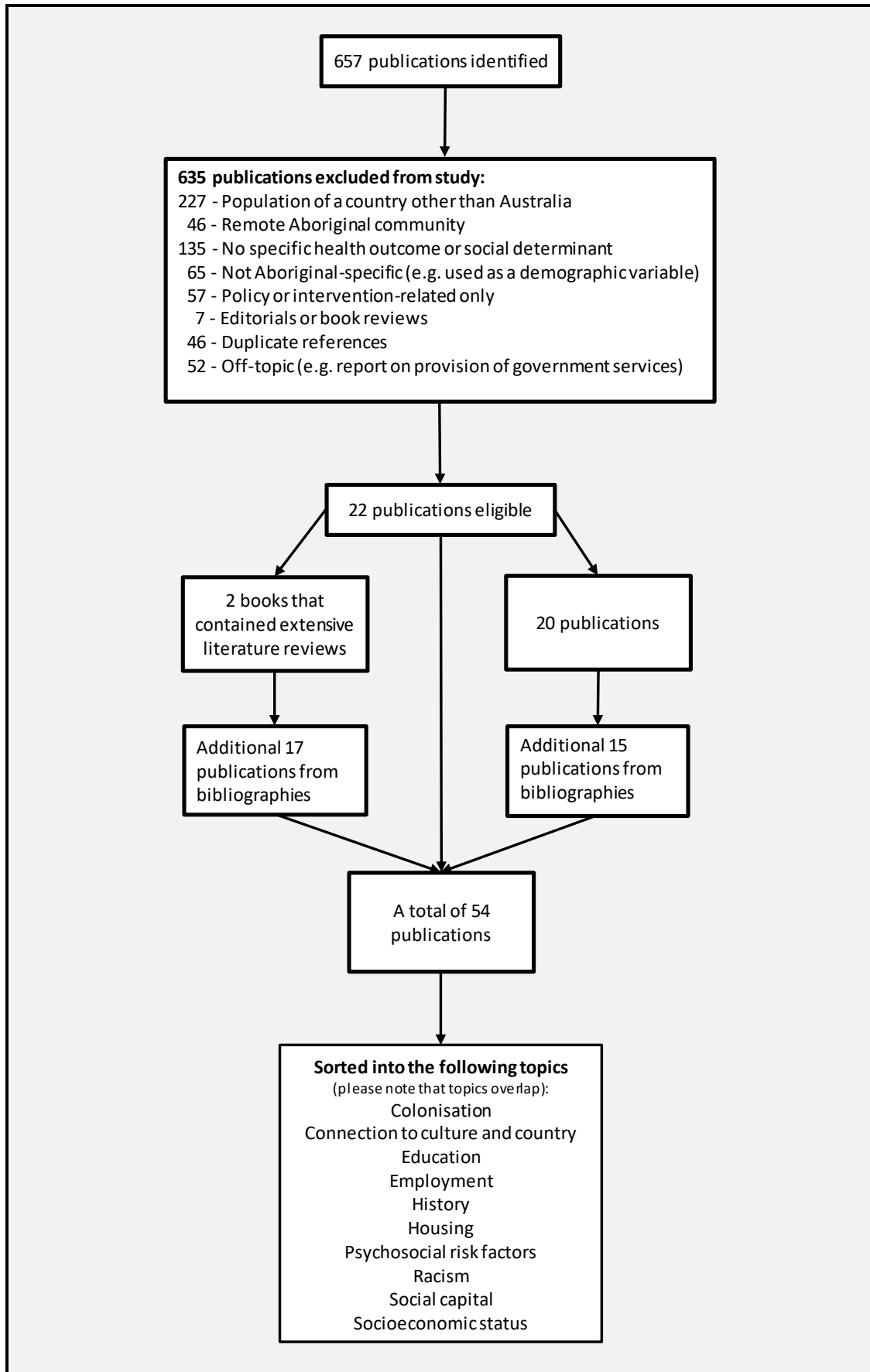
The second book was entitled '*Social determinants of Indigenous health*', also published in 2007, and based on a series of short courses on the social determinants of health held in Darwin (Carson et al. 2007). These short courses were also informed by the work published in the first book discussed above.

Based on the bibliographies of the two books, an additional 17 additional publications not found in the literature search were identified. This is primarily because many of these publications were outside the subject area of health because the subject of the social determinants of health traverses many other subject areas such as economics and sociology.

Excluding the two books, the literature search identified 20 publications, and these generated a further 15 publications based on the bibliographies of the 20 publications.

29% of the final selection of 54 publications were grey literature. These included government reports and research and discussion papers published by the Centre for Aboriginal Economic Policy Research (CAEPR), and the Cooperative Research Centre for Aboriginal and Tropical Health (CRCATH).

Figure 1.2: Results of literature search



Beginning with the 10 social determinants of health identified by the WHO, it became clear that the list was inadequate when applied to Aboriginal and Torres Strait Islander Australians. Work was therefore undertaken at the workshop held in Adelaide, sponsored by the Cooperative Research Centre for Aboriginal Health, to identify the social determinants of Aboriginal and Torres Strait Islander health.

The social determinants identified reflect the colonisation of Aboriginal and Torres Strait Islander Australia and are based on oral history research (Vickery et al. 2007). According to Vickery et al (2007): *“Oral records are records of Indigenous knowledge, with the use and access dictated by the knowledge holder. This is an action of decolonisation—where the story is told the way the person would tell it and not presented through another culture’s lens”* (Vickery et al. 2007).

Table 1.1 lists the social determinants that were recognised at the workshop as being the social determinants most relevant to Aboriginal and Torres Strait Islander health and wellbeing in Australia. These were separated into those that are the product of colonisation (negative) and those that would enable decolonisation (positive) (Vickery et al. 2007). This thesis will necessarily focus on the negative social determinants since the aim is to explain the health gap. These are in addition to the ten WHO social determinants of: socioeconomic status, stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport.

Vickery et al (2007) noted that there was a strong repetitive link between racism and most of the social determinants arising from colonisation, even though racism is included as its own social determinant.

Table 1.1: The social determinants of colonisation and decolonisation (Vickery et al. 2007)

Social determinants of colonisation	Social determinants of decolonisation
Poverty	Reconciliation
Social class	Land
Education and training	Control over health
Employment	Cultural survival
Income	Affirming cultural ceremony
Racism	Oral history
Marginalisation	Family support and connection
Incarceration	Spiritual and emotional wellbeing
Justice system	Native title and sites recognition
Housing	Self-determination
Infrastructure	Community control
Family separation	
History and health	
Cultural genocide	
Assimilation	
Collective trauma from previous generation	

The literature review will begin with considering the evidence on the process of colonisation (past and present) and how this affected and affects Aboriginal and Torres Strait Islander health and wellbeing.

Thereafter, the literature review will move to discussing differences in the economic and material environments of Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander peoples and the evidence on how these may contribute to differences in health outcomes. This includes the determinants of poverty and socioeconomic status, educational attainment, employment, and housing.

The literature review will then discuss the social environment. This includes social capital, psychosocial risk factors and racism.

Lastly, the literature review will look at the evidence of the relationship between connection to culture and country and health. While connection to culture and country is largely seen as a positive social determinant (see Table 1.1), its absence and the relationship of that absence to health is one of the better researched negative social determinants of Aboriginal and Torres Strait Islander health.

Given that this thesis was conducted part-time commencing in 2013, a number of years have passed since the literature review was performed. A follow-up search of the literature from 2014 to 2019 was therefore performed using the methods described above to identify key publications that add to the current state of knowledge. They are included accordingly and identified as an update.

History and health

Colonisation, the act of colonialism, has been identified as a key determinant of the health and wellbeing of indigenous peoples across the world, including Australia (Vickery et al. 2007) (Gracey et al. 2009) (Czyzewski 2011).

It is generally agreed that colonialism is a form of domination—the control by members of one group over the territory and/or behaviour of members of another group. Specifically, colonialism has been defined as: “... *that form of intergroup domination in which settlers in significant number migrate permanently to the colony from the colonizing power*” (Horvath 1972).

Settler colonialism is where the colonisers have primarily come to stay and create a new political order for themselves rather than exploiting the subjugated populations for the accumulation of wealth—sometimes referred to as ‘franchise colonialism’ (for example British India). Canada, Australia, New Zealand, and the United States are examples of settler colonialism (Veracini 2013).

Accounts of Australia’s history are strongly debated with ‘official’ accounts being that Australia was uninhabited and therefore settlement was based on the claim of terra nullius which means ‘nobody’s land’, although this was overturned in 1993 by the High Court’s Mabo

decision. The alternative view is that Australia was invaded, its native peoples massacred, dispossessed, and subjugated (Augoustinos et al. 1999) (Harris 2003).

Many (mostly non-Aboriginal and Torres Strait Islander Australians) argue that colonisation is an event of the past, while others (mostly Aboriginal and Torres Strait Islander Australians) believe colonisation is an ongoing process that continues to damage the health and wellbeing of Aboriginal and Torres Strait Islander Australians (Axelsson et al. 2016) (Vickery et al. 2007).

While it remains contested as to whether colonisation is an act of the past or ongoing, it is widely acknowledged that the history of colonisation is an important determinant of Aboriginal and Torres Strait Islander health today (Mitchell 2007).

Colonisation not only reduced Aboriginal and Torres Strait Islander populations through violence and massacres, Europeans also brought with them diseases that Aboriginal and Torres Strait Islander peoples had never been exposed to before and had no immunity against. This included smallpox, influenza, pertussis, measles, tuberculosis, and venereal diseases (Mitchell 2007). The Aboriginal and Torres Strait Islander population of Victoria was believed to be about 60,000 prior to colonisation in 1788, but reduced by two smallpox epidemics to about 15,000 by the time formal European settlement began in Victoria in 1835 (McCalman et al. 2009). Thereafter, the Aboriginal and Torres Strait Islander population of Victoria was reduced to less than 1,000 by 1901 through massacres, dispossession of land, exploitation, and subjugation (Broome 2005).

Aboriginal and Torres Strait Islander ill-health was not only caused by colonisation but was also used to justify racial segregation, social exclusion, and exploitation (Mitchell 2007). For example, the Western Australian *Native Act 1944* conferred citizenship to Aboriginal and Torres Strait Islander peoples with European ancestry who agreed to live as Europeans. However, ill-health due to various infectious diseases was an exclusion criterion and those who subsequently became ill had their citizenship revoked (Mitchell 2007).

By the early decades of the twentieth century, most Aboriginal and Torres Strait Islander peoples had been confined through legislation by state governments to live on missions, government stations or reserves, segregated from the non-Aboriginal and Torres Strait Islander population (McCalman et al. 2009).

Victoria led the way with the passing of the *Aboriginal Protection Act 1869*, which served as a model for similar legislation in the rest of the country (Broome 2005). The Act provided for the establishment of a Central Board to watch over the interests of Aboriginal and Torres Strait Islander Victorians who were relegated to live on seven reserves and 23 small camping places, mainly controlled by sub-contracted Christian groups (Broome 2005). In the 1920s, Aboriginal and Torres Strait Islander Victorians were moved hundreds of kilometres away to be concentrated in a few larger reserves as part of a deliberate attempt to sever the

connection between Aboriginal and Torres Strait Islander Victorians and their lands (Broome 2005).

The living conditions on the reserves, missions, and government stations were health damaging due to being overcrowded and unhygienic, a lack of / or access to medical care, being denied their traditional diet, and being given unhealthy and inadequate nutrition that was rich in starch and sugars and devoid of fresh fruit and vegetables (Rowley 1986). These conditions also gave rise to epidemics of disease.

Moreover, the authorities exerted an extreme level of control over the lives of Aboriginal and Torres Strait Islander peoples including dictating who they could marry, what jobs they could do, how they would be compensated for their labour, what language(s) they could speak, what culture they could practice, and where they could live and physically be (Vickery et al. 2007).

Victoria

Victoria is recognised as having one of the best vital registrations in the world that began in 1853 under William Archer a protege of the famous William Farr, Chief Statistician of the General Register Office of England and Wales (Larson 1994). Consequently, the first two longitudinal historical cradle-to-grave datasets were constructed in Victoria.

The Lying-In Hospital Birth Cohort, 1857-1985 (the LIH Birth Cohort) consisted of an impoverished cohort of Europeans born at the charitable Melbourne Lying-In Hospital (which subsequently became the Royal Women's Hospital) between 1857-1900 and traced until 1985 through marriage and death certificates (McCalman et al. 2008).

In 1999, the University of Melbourne collaborated with the Bunjilaka Centre at Museum Victoria to reconstitute the Aboriginal and Torres Strait Islander population of Victoria under colonisation. They used genealogies built from the Aboriginal and Torres Strait Islander community of Victoria's preserved oral knowledge of lineages and relationships and supplemented with vital registration data and information from other historical records, such as the records of the Victorian Aboriginal Protection Board, to construct the Koori Health Research Database (KHRD) (McCalman et al. 2009).

McCalman et al (2009) performed survival analysis of the KHRD and LIH Birth Cohort datasets from the 1850s to the 1980s to compare the mortality experiences of Aboriginal and Torres Strait Islander Victorians and impoverished Europeans. They selected tuberculosis mortality as a key measure of deprivation (McCalman et al. 2009).

Both the Aboriginal and Torres Strait Islander and European populations captured in the two datasets were highly impoverished and stressed with high infant mortality rates and high death rates from tuberculosis. However, the Aboriginal and Torres Strait Islander population was also subject to racism and social exclusion which prevented them from benefiting from

the various biomedical advances and welfare interventions, such as land and housing, that significantly improved the health of their impoverished European counterparts.

This was despite the 1886 *Half-Castes Act* which forced all Aboriginal and Torres Strait Islander people of mixed ancestry to leave the reserves and missions to join European society as ‘legal Europeans’. However, regardless of their ‘legally European’ status, they were denied the same rights and entitlements as their European counterparts of non-mixed ancestry (McCalman et al. 2009). Their failure to thrive, due to such extreme hostility and social exclusion, is reflected in the current Aboriginal and Torres Strait Islander population of Victoria, which appears to be almost entirely descended from those taken under the Victorian Aboriginal Protection Board and forced to live on reserves and missions.

Despite the similarity in material life circumstances, the mortality experience of Aboriginal and Torres Strait Islander Victorians and impoverished Europeans from the 1850s to the 1980s could not have been more different. The infant mortality rate and mortality due to tuberculosis significantly declined in the impoverished European population, associated with the introduction of supportive entitlements including biomedical and welfare interventions.

In contrast, the infant mortality rate remained the same in the Aboriginal and Torres Strait Islander population, while the incidence of and mortality rate due to tuberculosis significantly increased—widening the gap in life expectancy (McCalman et al. 2009). Aboriginal and Torres Strait Islander Victorians were denied all the supportive entitlements that were given to their impoverished European counterparts.

Stolen wages and income management

From the 1800s to the 1970s many Aboriginal and Torres Strait Islander workers were paid in goods and services rather than financial resources, justified by the colonial belief that Aboriginal and Torres Strait Islander peoples were incapable of managing their financial affairs (Gray 2007).

In 2006, the Senate Standing Committee on Legal and Constitutional Affairs produced its report entitled: *Unfinished business: Indigenous stolen wages*. Each state and territory varied in the way it controlled the employment, working conditions and wages of Aboriginal and Torres Strait Islander workers and the report investigated the role of state governments.

For example, wages were totally under the control of the Western Australian government until 1968. In contrast, the committee received very little information in relation to the control of employment and wages in Victoria.

Essentially, the common denominator across the states was that wages were not directly paid to Aboriginal and Torres Strait Islander workers. They were often paid to non-Aboriginal and Torres Strait Islander ‘Aboriginal protectors’ or kept in trust accounts by the states. Moreover, a lot of that money unaccountably disappeared and today many Aboriginal and Torres Strait Islander peoples across Australia are seeking legal redress and recompense (Gray 2007).

Update of literature from 2014-2019: In 2007, in response to the *Little Children are Sacred: Report of the Northern Territory Board of Inquiry into the Protection of Aboriginal Children from Sexual Abuse (2007)*, the federal government suspended the *Racial Discrimination Act 1975* to enable the implementation of what has come to be known as the 'Northern Territory Intervention' (Bielefield 2014/2015). This included compulsory income management for all Aboriginal and Torres Strait Islander recipients of unemployment benefits, also known as 'welfare benefits'. 50-70% of a welfare recipient's income is quarantined and they are issued with a BasicsCard that restricts what they can buy and where they can buy it. The aim was to prevent government money being spent on alcohol, tobacco, or pornography (Bielefield 2014/2015).

The intervention has been seen by some as a continuation of colonisation (Moreton-Robinson 2009). The federal government claims that the intervention is effective, despite two government commissioned reviews that disagree and a wealth of literature that shows that the denial of autonomy and stigmatisation that income management causes, also causes psychological harm in the form of stress, anger, and trauma (Bielefield 2014/2015). Moreover, the logic and of income management as a means of addressing the child sexual abuse that precipitated the intervention in the first place has been questioned.

The federal government is expanding compulsory income management of welfare recipients across the country in areas that have substantial Aboriginal and Torres Strait Islander populations, such as the Greater Shepparton area in Victoria (Bielefield 2014/2015). The federal government denies that this is a race-based intervention on the grounds that it is now introducing compulsory income management for non-Aboriginal and Torres Strait Islander welfare recipients. However, the majority of adults subject to compulsory income management continue to be Aboriginal and Torres Strait Islander.

Family separation - the Stolen Generations

Among the non-Aboriginal and Torres Strait Islander population was a belief that Aboriginal and Torres Strait Islander extinction was inevitable and desirable (Mitchell 2007). This belief fuelled a succession of assimilationist government policies from the 1890s to the 1970s that included forcibly removing Aboriginal and Torres Strait Islander children with mixed ancestry from their parents. The children were placed in institutions run by government or churches, adopted by non-Aboriginal and Torres Strait Islander families, or placed in non-Aboriginal and Torres Strait Islander households to work as domestic servants and farm hands. Often the children were abused, emotionally, physically, and sexually, and indoctrinated with the belief that Aboriginal and Torres Strait Islander peoples were inferior (The Healing Foundation 2017).

This practice continued into the early 1970s resulting in what has been termed the 'Stolen Generations'. In 1995, a national inquiry was launched into the forced separation of Aboriginal and Torres Strait Islander children from their families between 1910 and 1970 and

resulted in the publication of a landmark report entitled *Bringing them Home: Report of the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from Their Families 1997* (Baum et al. 2007). The report documented the severe impacts of these policies on the mental, emotional, and physical health of Aboriginal and Torres Strait Islander children and their families and made recommendations on how to prevent this from happening again.

Update of literature from 2014-2019: To date, few of the recommendations that were made have ever been implemented by any state or territory, with the exception of a formal apology to the Stolen Generations made by the newly elected Prime Minister following a change in government in 2007, and the establishment in 2009 of the Aboriginal and Torres Strait Islander Healing Foundation (The Healing Foundation 2017).

The Healing Foundation subsequently contracted the Australian Institute of Health and Welfare (AIHW), to conduct a study of the Stolen Generations based on the National Aboriginal and Torres Strait Islander surveys of 2002 to 2014-15. A person was considered to be a member of the Stolen Generations if they were born before 1972 and were removed from their family by the government. The year of 1972 was selected because this was the year that the last of the state and territory legislation that created the Stolen Generations was formally repealed. The 2014-15 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) found that 31% of the Aboriginal and Torres Strait Islander population while not personally removed had relatives who had been removed, and an additional 13% had been personally removed (Australian Bureau of Statistics 2016c)

The members of the Stolen Generations were significantly more likely (OR=1.6; 95% CI: not reported) than those who were not members of the Stolen Generations to have poor general health, based on a composite measure of health, after adjusting for age, sex, socioeconomic status (education, employment and income) and health risk factors (smoking, alcohol consumption and fruit and vegetable consumption) (Australian Institute of Health and Welfare 2018). The composite health measure covered subjective and objective measures of both mental (psychological distress and a disability score) and physical health (self-reported health status and a morbidity score).

Members of the Stolen Generations were also significantly more likely to have been incarcerated (OR=3.3), unemployed (OR=1.6), a victim of physical violence (OR=1.7), and to have experienced homelessness (OR=1.6) (Australian Institute of Health and Welfare 2018).

A second study combined data from the 2008 and 2014-15 NATSISS surveys to compare the health and wellbeing of children aged 15 or younger who lived in households with a member(s) of the Stolen Generations with those who did not (Australian Institute of Health and Welfare 2019b). For the first time, this study provides evidence of the transgenerational transmission of trauma.

Children who lived in a household with a member of the Stolen Generations constituted 3% of the Aboriginal and Torres Strait Islander population aged 15 or younger. These children had a significantly higher odds of poor self-assessed health (OR=1.6; 95% CI: not reported), stress (OR=1.8), experiencing racism at school (OR=1.9), and were significantly more likely to have missed school without permission (OR=4.5), after adjusting for age, sex, remoteness, socioeconomic status (household income), and lone-parent status. The authors conclude that the policies implemented prior to 1972 that created the Stolen Generations, continue to have negative impacts on health and wellbeing through the transgenerational transmission of trauma (Australian Institute of Health and Welfare 2019b).

To date, Aboriginal and Torres Strait Islander children are ten times more likely to be removed from their families than non-Aboriginal and Torres Strait Islander children prompting concerns of another Stolen Generation (O'Donnell et al. 2019). Children of mothers with substance abuse problems and those who reside in remote communities and are at increased risk of removal compared with their non-Aboriginal and Torres Strait Islander counterparts (O'Donnell et al. 2019). The reasons are varied, complex and difficult to disentangle from the impacts of abject poverty. However, there is evidence of discriminatory practices, institutional racism and biases, and cultural differences in child-rearing that may contribute (Tilbury et al. 2009).

Collective transgenerational trauma

The impact of colonisation on Aboriginal and Torres Strait Islander Australians has been described as 'collective trauma' that is passed on through the generations (Krieg 2009). 'Collective trauma' refers to the psychological responses to a traumatic event such as war, colonisation, and genocide that affect an entire society and remains in the collective memory of the group who engage in an ongoing reconstruction of the trauma in an attempt to make sense of it (Hirschberger 2018).

Communities that suffer from collective trauma typically exhibit: distrust of self and others; unremitting grief; shame and humiliation; intergenerational conflict; cultural genocide; leadership crises; an overall attitude of secrecy; violence; substance misuse; engagement in risky behaviours; and have higher rates of suicide—all of which impact on health and wellbeing (Krieg 2009).

Poverty and socioeconomic class

Background

It is well documented in the literature across the world and in Australia that most diseases, conditions, and risk factors follow a socioeconomic gradient, where the lower the socioeconomic status of an individual the more likely they are to have poorer health. Such gradients exist not just among the least and most disadvantaged in societies but also across groups that do not differ hugely in measures of material wellbeing as shown by Marmot's famous Whitehall studies of British civil servants in the 1980s (Marmot et al. 1984). British

civil servants with the lowest occupational status were three times more likely to die than those with the highest occupational status, especially from cardiovascular disease.

Socioeconomic status is typically measured by income, education and/or occupation. However, while often used interchangeably, these measures are only moderately correlated with each other and each measure can mean something different in different populations (Adler and Snibbe 2003).

Socioeconomic status and Aboriginal and Torres Strait Islander health

With Federation in 1901, the government brought in a generous package of welfare reforms that included but were not limited to pensions, child endowment, family support and returned soldier's repatriation benefits. However, Aboriginal and Torres Strait Islander peoples were largely excluded from these welfare benefits well into the 1960s (McCalman et al. 2009).

Today, the socioeconomic disparities between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Australians remain so great that a significant proportion of Aboriginal and Torres Strait Islander Australians live under conditions that meet the United Nations definition of absolute poverty. Absolute poverty is defined as "... *severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information*" (Walter and Siggers 2007). Such conditions are not conducive to good health.

Despite a risk factor analysis study showing that up to 54% of the gap in life expectancy between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Australians is explained by differences in socioeconomic status, it is not clear whether socioeconomic status also accounts for differences in health *within* Aboriginal and Torres Strait Islander Australian populations (Zhao et al. 2013).

Table 1.2 summarises the studies of the health of Aboriginal and Torres Strait Islander Australians by socioeconomic status between 1999 and 2013, identified in the literature search. The literature research identified five articles: 3 cross-sectional studies (Hunter 1999) (Shepherd, Li et al. 2012a) (Shepherd, Li et al. 2012b); one cohort study (Cunningham, O'Dea et al. 2008); and a literature review (Shepherd, Li et al. 2012c).

Table 1.2: Studies of the health of Aboriginal and Torres Strait Islander Australians by socioeconomic status

Author and Year	Location	Study design	Findings
Hunter 1999	Australia	Cross-sectional population-representative survey – 1994 National Aboriginal and Torres Strait Islander (NATSIS).	<ul style="list-style-type: none"> • 33.1% of Aboriginal and Torres Strait Islander Australians who were in the lowest quintile of equivalent household income had a long-term health problem compared with 28.2% in the highest quintile. Hence there was no socioeconomic gradient. • There was also no socioeconomic gradient in the proportions of Aboriginal and Torres Strait Islander Australians who had contact with the justice system whether measured by arrest rate, contact with police, police brutality or being a victim of crime. • Overcrowded housing was a problem for many Aboriginal and Torres Strait Islander households even those population-representative survey relatively high incomes. • The findings were not sensitive to unit of measurement or the type of equivalence scale used to adjust for household size and composition. • Aboriginal and Torres Strait Islander Australians in high income households were more likely to be employed in mainstream employment, to have higher levels of educational attainment and to live in capital cities. • Poor health, high arrest rates and inadequate housing are a common experience among Aboriginal and Torres Strait Islander Australians, regardless of household income. • It is therefore not appropriate to focus on income as a measure of poverty among Aboriginal and Torres Strait Islander Australians because other non-monetary measures of poverty are important.
Cunningham et al 2008	Darwin, Northern Territory	Cross-sectional study - the Diabetes and Related conditions in Urban Indigenous people in the Darwin, Australia region (DRUID) study. Non-randomly recruited 1,004 participants aged 15 years and older.	<ul style="list-style-type: none"> • 17.1% of cohort had diabetes and a further 12.9% had impaired glucose tolerance or impaired fasting glucose. • Found a typical socioeconomic gradient among urban Aboriginal and Torres Strait Islander peoples who lived in Darwin and had diabetes, whether socioeconomic status was measured by household income, employment status or housing tenure—the higher the socioeconomic status the lower the prevalence of diabetes.

Author and Year	Location	Study design	Findings
Shepherd et al 2012a	Western Australia	Cross-sectional survey of 5,289 Aboriginal and Torres Strait Islander children aged 0-17 years – 2000-02 Western Australian Aboriginal and Child Health Survey (WAACHS).	<ul style="list-style-type: none"> • Investigated the prevalence of six physical health indicators by seven indicators of SES status—education, occupation, financial strain, housing tenure and housing quality, and two area-level socioeconomic status indicators (SEIFA quintiles). • Of 48 associations examined, 17 were statistically significant and another 7 had at least one significant difference in health status between categories of socioeconomic status. • There was evidence of typical socioeconomic gradients where poorer health was associated with lower socioeconomic status for ear infections, recurring chest infections and sensory function problems. • In contrast, there were reverse socioeconomic gradients for asthma, accidents and injuries, and oral health problems. • The strongest findings were for the area-level measures of socioeconomic status, while the other measures of socioeconomic status only showed weak to moderate associations. • The authors conclude that while socioeconomic status plays some part in the physical health of Aboriginal and Torres Strait Islander children, other factors play a significant role. For example, the link between education and wealth creation may be considerably weakened by racism and discrimination.
Shepherd et al 2012b	Western Australia	Cross-sectional survey – 2000-02 WAACHS.	<ul style="list-style-type: none"> • Investigated the risk of clinically significant emotional and behavioural disorders (CSEBD) by seven indicators of socioeconomic status—education, occupation, financial strain, housing tenure and housing quality, and two area-level socioeconomic status indicators (SEIFA quintiles). • 24% of Aboriginal and Torres Strait Islander children were classified as being at high risk of CSEBD. • Overall, higher socioeconomic status was associated with a lower risk of mental health problems in Aboriginal and Torres Strait Islander children. • The strongest findings were for housing tenure, housing quality and one of the area-level measures of socioeconomic status. • The socioeconomic gradients were partly explained, but not eliminated, by a range of factors including parenting quality, life stress events, family composition,

Author and Year	Location	Study design	Findings
			overcrowding, household mobility, perceptions of racism in the neighbourhood, and family functioning.
Shepherd et al 2012c	Australia	Literature review to 2010 of studies that quantitatively examined the relationship between at least one socioeconomic factor and a health risk, outcome, or action among Aboriginal and Torres Strait Islander Australians.	<ul style="list-style-type: none"> • Identified 16 studies—13 cross-sectional, 2 retrospective cohort and 1 ecological study. • 63% of the studies found at least one typical socioeconomic gradient where higher socioeconomic status was associated with better health. • 2 studies found a U-shaped relationship between education and health. • 3 studies found no relationship between socioeconomic status and health. • 2 studies reported inconclusive evidence. • The authors conclude that unlike non-Aboriginal and Torres Strait Islander populations, the socioeconomic patterning of health among Aboriginal and Torres Strait Islander populations is less universal and less consistent. • The authors note that there is an overrepresentation of Aboriginal and Torres Strait Islander peoples in the lower levels of all measures of socioeconomic status and this may reduce the statistical power to detect socioeconomic gradients. • Similar findings have been noted among African Americans where exclusion and discrimination are implicated in the production of flat relative socioeconomic gradients. The authors hypothesise that this may also be the case for Aboriginal and Torres Strait Islander Australians.

Overall, the evidence that socioeconomic gradients in health exist is not as strong or consistent for Aboriginal and Torres Strait Islander Australians as it is for non-Aboriginal and Torres Strait Islander Australians. Given that the variance in socioeconomic status of Aboriginal and Torres Strait Islander Australians is low as they are underrepresented in the higher socioeconomic status levels, this may simply reflect low statistical power to detect a gradient. Alternatively, there may not be clear cut socioeconomic gradients of Aboriginal and Torres Strait Islander health for reasons currently unknown.

Measuring socioeconomic status by Aboriginal and Torres Strait Islander status is complicated. For example, it is difficult to compare personal or household income between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Australians because family structures tend to be very different. Aboriginal and Torres Strait Islander households tend to be much larger, multigenerational, and more likely to consist of more than one family than non-Aboriginal and Torres Strait Islander households (Hunter et al. 2003). Moreover, financial responsibilities of a household may extend beyond the immediate household.

Therefore, it is easy to assume that an Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander household reporting the same household income are equivalent when they are not. Data from the Australian Bureau of Statistics estimated that the average weekly gross mean income of Aboriginal and Torres Strait Islander households was 60% of that of non-Aboriginal and Torres Strait Islander households (Hunter 1999). However, when Hunter (1999) adjusted for household size and applied an equivalence scale to take into account the economies of scale associated with larger households, Aboriginal and Torres Strait Islander households were twice as likely to have incomes that were 40% of the national median than non-Aboriginal and Torres Strait Islander households (Hunter 1999).

Income, education, and occupation are very blunt measures of Aboriginal and Torres Strait Islander socioeconomic status and lead to serious underestimation of the true level of Aboriginal and Torres Strait Islander poverty because they are measures of relative poverty rather than absolute poverty (Walter 2007). Therefore, an Aboriginal and Torres Strait Islander person living in a remote Aboriginal and Torres Strait Islander community may appear to be of moderate socioeconomic status because they have a secondary school education, reasonable occupation and income, but they are living in a remote community that has a contaminated water supply, high rates of trachoma and no access to healthy affordable fresh food.

Since the majority of studies were cross-sectional, no assertions can be made about causality or its direction(s)—they can only identify statistical associations between health and measures of socioeconomic status.

Education

Background

While education is a cause, consequence, and measure of socioeconomic status, it is in itself also an important determinant of health. In the context of Australia, 'education' generally refers to 'Western education' that is provided by the all the state and territory governments. It is not traditional Aboriginal and Torres Strait Islander education.

Education is one of the main ways in which societies reproduce themselves with their understanding of the social and political roles and responsibilities of their citizens, and how power is distributed and exercised (Boughton 2000). Mansouri and Jenkins (2010) argue that *"Curriculum is also a form of language which can perpetuate power, dominance and superiority through the inclusion or exclusion of particular topics and activities"* (Mansouri and Jenkins 2010). An example of a topic that is frequently missing from most school curricula across Australia, or only briefly mentioned, is Aboriginal and Torres Strait Islander history and culture. This is reflected in the results of a national survey of 10,000 teachers which found that 80% of the teachers had not studied any units on the histories and cultures of Aboriginal and Torres Strait Islander peoples when they took their teaching degrees (Malin and Maidment 2003).

Internationally, there is strong evidence to suggest that education improves the health of populations and this has been shown in both high-income and low-income countries (Dunbar and Scrimgeour 2007). Therefore, it is assumed and posited by the Australian Medical Association, the Australian Bureau of Statistics (ABS) and the Australian Institute of health and welfare (AIHW) that Western education, provided by all state and territory governments, is a key factor in improving Aboriginal and Torres Strait Islander health (Dunbar and Scrimgeour 2007).

Education and Aboriginal and Torres Strait Islander health

Aboriginal and Torres Strait Islander Australians continue to have lower levels of educational attainment due to significantly lower participation and retention rates in the education system, compared with their non-Aboriginal and Torres Strait Islander counterparts (Bell et al. 2007). However, until the Cooperative Research Centre for Aboriginal Research and Tropical Health (CRCATH) began investigating the link between health and education among Aboriginal and Torres Strait Islander Australians in 1997, only one study had ever been conducted (Dunbar and Scrimgeour 2007).

Table 1.3 summarises the studies of the health of Aboriginal and Torres Strait Islander Australians by educational attainment between 1999 and 2013. The literature research identified 6 articles: 1 literature review (Boughton 2000); 3 cross-sectional studies (Gray and Boughton 2001) (Ewald and Boughton 2002), (Hunter 2002); and 2 qualitative studies (Malin 2003) (Priest et al. 2012).

Table 1.3: Studies of the health of Aboriginal and Torres Strait Islander Australians by education

Author and Year	Location	Study design	Findings
Boughton 2000	Australia	Literature review	<ul style="list-style-type: none"> An analysis of the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) found that the age-adjusted odds of being obese were higher in Aboriginal and Torres Strait Islander men with a higher education (completed Year 12 or higher)—the reverse was true for non-Aboriginal and Torres Strait Islander men.
Gray and Boughton, 2001	Australia	Cross-sectional population-representative survey – 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS).	<ul style="list-style-type: none"> Investigated whether healthcare seeking behaviour was associated with maternal level of education using the age that the mother left school as the measure of educational attainment. There was a U-shaped relationship, where the children of the least and most educated mothers were the most likely to have had health action taken for them. Adjusting for the covariates of the age of the child, the child’s health status and the age of the mother failed to explain these findings.
Ewald and Boughton, 2002	Rural Central Australia	Cross-sectional face-to-face interview of 183 Aboriginal and Torres Strait Islander children and 123 carer mothers recruited through an opportunistic exploratory project associated with a housing and sewerage project.	<ul style="list-style-type: none"> Investigated whether the proportions of children with any of the following conditions – growth stunting, underweight, purulent ear or nose infection or sores, scabies and/or trachoma – varied by the level of educational attainment of their carer mothers. Using linear or logistic regression the authors did not find a direct link between the level of educational attainment of the mothers and the health of their children. However, they did find a direct link between employment and health, where employed mothers had healthier children.
Hunter 2002	Brisbane, Queensland	Cross-sectional study of 672 Aboriginal and Torres Strait Islander infants born between 1996-1999 to identify risk factors for low birth weight, preterm birth, and intrauterine growth restriction (IUGR).	<ul style="list-style-type: none"> Socioeconomic status, smoking, alcohol consumption and recreational drug use were identified as risk factors. Maternal educational attainment was found to be the single most important predictor of intrauterine growth retardation with 35% of mother who did not reach Year 10 giving birth to babies with IUGR, compared to none of those with a post-secondary education.

Author and Year	Location	Study design	Findings
Malin 2003	Adelaide, South Australia	Qualitative micro-ethnography in an urban classroom.	<ul style="list-style-type: none"> • Observed overt and covert, intentional and unintentional racism against Aboriginal and Torres Strait Islander children by both teachers and students, that negatively impacted on their social and emotional health and wellbeing. • The Aboriginal and Torres Strait Islander children often responded by becoming angry and frustrated which was punished rather than understood. This resulted in their social exclusion and academic marginalisation. • Given that social exclusion is associated with poor health, the authors speculate that the social exclusion of Aboriginal and Torres Strait Islander children in schools may nullify any positive effects of schooling on their health.
Priest et al 2012	Urban Victoria	Qualitative study. In-depth interviews of 25 non-randomly selected Aboriginal and Torres Strait Islander adults with children.	<ul style="list-style-type: none"> • The study sought to address gaps in research and explore Aboriginal and Torres Strait Islander perspectives on child health and wellbeing. • The participants identified schools as an important place where Aboriginal and Torres Strait Islander children are exposed to racism—institutionally and from students and teachers. • Some children experienced racism daily and this negatively impacted on their social and emotional health and wellbeing. • Educating non-Aboriginal and Torres Strait Islander peoples about Aboriginal and Torres Strait Islander culture and history was recognised as an important means of challenging racism, yet few schools include this in their curricula.

The evidence shows that there is no clear and consistent relationship between health and education among Aboriginal and Torres Strait Islander Australians, in contrast to what has been observed in many countries and populations across the world.

Malin (2003) hypothesised that the positive effects of education on health that are seen in other populations may not be seen in Aboriginal and Torres Strait Islander populations in Australia, due to the negative impact of social exclusion in the classroom on their social and emotional health and wellbeing (Malin 2003).

Dunbar and Scrimgeour (2007) noted that the causal pathways between Aboriginal and Torres Strait Islander participation in education and health outcomes are complex and another question that remains unanswered is whether higher levels of education lead to better health or better health leads to higher levels of education (Dunbar and Scrimgeour 2007).

However, most of the studies in Table 1.3 were cross-sectional or qualitative and are therefore not designed to make any assertions about causality or its direction(s).

Update of literature from 2014-2019: Crawford and Biddle (2017) investigated whether the association between some key social determinants and health outcomes had changed over time, using the 2002 and 2008 NATSISS and the 2004-05 and 2012-13 NATSIHS (Crawford et al. 2017).

Of the social determinants examined (education, employment, income and housing) the only one that had consistently changed over time was education—there was a significant increase in the proportion of Aboriginal and Torres Strait Islander Australians who completed Year 12 or attained a Certificate 1-Advanced Diploma level qualification. While completing Year 12 was associated with lower levels of psychological distress in 2004-05 and 2008, it was no longer statistically significantly associated with lower levels of psychological distress in 2012-13. The authors concluded: *“As Indigenous students from greater diversity of circumstances complete Year 12 and participate in tertiary education, the salience of education as a determinant of health and wellbeing in its own right is diminishing”* (Crawford et al. 2017).

Employment

Background

As with education, employment is not only a cause, consequence, and measure of socioeconomic status, it is also an important determinant of health in itself.

Currently, the dominant Western neoliberal view of employment, that informs governmental policy-making in this area, holds that Aboriginal and Torres Strait Islander peoples need to be employed in market-based mainstream employment necessitating relocation from areas of high unemployment to area of lower unemployment (Walter and Mooney 2007). The assumption being that this will raise incomes and improve health.

Employment and Aboriginal and Torres Strait Islander health

Aboriginal and Torres Strait Islander peoples are significantly more likely than their non-Aboriginal and Torres Strait Islander counterparts to be unemployed and those who are employed, to be in insecure and low-paid, low-skill jobs (Lowry and Moskos 2007). Aboriginal and Torres Strait Islander peoples also experience social exclusion from the mainstream which may be a cause and/or a consequence of unemployment (Hunter 2000).

An analysis of the inaugural 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) which surveyed a population-representative sample of Aboriginal and Torres Strait Islander peoples aged 15 years and older across Australia showed a significant relationship between employment and health (Lowry and Moskos 2007). Both males and females who were unemployed or not in the labour force, reported being in worse health than those who were in mainstream employment.

In contrast, another analysis of the 1994 NATSIS found that the presence of a long-term health problem was not associated with Aboriginal and Torres Strait Islander labour force participation. (Hunter 2000). The authors found no significant differences between labour force participation and the presence of a long-term health problem for Aboriginal and Torres Strait Islander peoples who lived in urban areas. In contrast, Aboriginal and Torres Strait Islander men and women who lived in rural areas and were unemployed were 9.2% and 4.2%, respectively, less likely to have a long-term health problem than those in mainstream employment.

Another study that examined cross-sectional data from the Department of Employment, Work Relations and Small Businesses found that ill-health was a barrier to employment (Hunter 2000).

After the 1994 NATSIS, the ABS decided to split the NATSIS survey into two separate surveys—the National Aboriginal and Torres Strait Islander Social Survey (NATSISS) and the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS). Each survey was to be conducted every six years and staggered three years apart. In 2002, the first NATSISS was conducted designed to investigate social factors and characteristics. Employment status was again found to be related to self-rated health status, where the unemployed and those not in the labour force were more likely to report being in poor health (Australian Bureau of Statistics 2004).

However, when the trends in employment status and self-rated health status were compared between the 1994 NATSIS and the 2002 NATSISS, there was no change in the employment rate, but there was a significant increase in the proportion of people who reported being in poor health. Moreover, Aboriginal and Torres Strait Islander peoples who lived in non-remote communities, where the rates of employment were higher compared with those who lived in remote communities, were more likely to rate their health as poor. These findings would

suggest little or no relationship between employment status and health (Australian Bureau of Statistics 2004).

To further understand the relationship between employment and health, a study was conducted to understand the employment conditions and experiences of Aboriginal and Torres Strait Islander peoples. Data from the 2005 Australian Workplace Industrial Relations Survey showed that Aboriginal and Torres Strait Islander peoples were more likely to experience significant disadvantage in the workplace than non-Aboriginal and Torres Strait Islander peoples (Hunter and Hawke 2000a) (Hunter and Hawke 2000b). Aboriginal and Torres Strait Islander employees were more likely to be short-term employees, to be underemployed, not to receive paid sick or holiday leave, have no access to maternity leave, and less likely to receive bonuses for job performance. They were also more likely to be in jobs where they had little say or control over their work and working environment and were less likely to be consulted or listened to by their employer.

The disparity in employment conditions between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander employees may indicate that employment is more healthful for non-Aboriginal and Torres Strait Islander peoples than Aboriginal and Torres Strait Islander peoples. This would be consistent with the findings of the Whitehall studies of the health of British civil service employees, where psychosocial risk factors, such as lack of control over one's work, explained the poorer health of employees the lower they were on the social gradient (Matthews et al. 2010). Whether this also explains, at least in part, the lack of a clear and consistent association between employment and health among Aboriginal and Torres Strait Islander peoples, remains to be determined.

Housing

Introduction

According to Shaw (2004) "*Housing is a basic human right, enshrined by the United Nations as the right not just to basic shelter but to "adequate housing", in terms of legal security of tenure; availability of services, materials, facilities, and infrastructure; affordability; habitability; accessibility; and location and cultural adequacy*" (Shaw 2004). Shaw also noted that owning rather than renting a home "*...confers ontological security—a sense of security, control and mastery*" that can be beneficial for health" (Shaw 2004).

It is well acknowledged that housing for Aboriginal and Torres Strait Islander Australians is poor and inadequate (Bailie 2007). Analysis of the 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) and the 2007-08 National Health Survey showed that: 27.4% of Aboriginal and Torres Strait Islander households were homeowners or buyers compared with 72.3% of non-Aboriginal and Torres Strait Islander households. Of those who rented, 29.8% of Aboriginal and Torres Strait Islander households rented privately compared with 23.0% of non-Aboriginal and Torres Strait Islander households, and 38.6% of Aboriginal and Torres Strait Islander households relied on social housing, compared with only 3.2% of non-Aboriginal and Torres Strait Islander households (Australian Bureau of Statistics 2010).

In addition to having less secure housing tenure, the quality of housing that many Aboriginal and Torres Strait Islander Australians live in is often poor and sub-standard. The 2008 NATSISS showed that 26% of Aboriginal and Torres Strait Islander households reported living in residences with structural problems, such as serious cracks in floors or walls, major electrical and plumbing problems, and roof defects (Australian Bureau of Statistics 2010). As well as structural problems, 13% of all Aboriginal and Torres Strait Islander adults lived in residences with at least one faulty household facility (Australian Bureau of Statistics 2010).

While the poor quality of housing for Aboriginal and Torres Strait Islander Australians occurs in both rural and urban areas, those who live in rural and remote Aboriginal and Torres Strait Islander-dominated communities are particularly affected (Bailie 2007). For example, a survey of residences funded by the Indigenous Housing Authority of the Northern Territory found that 62% of the residences surveyed were non-functional or did not have the infrastructure required for the safe storage and preparation of food. Similarly the facilities required for personal hygiene and safe removal of human waste were not functional in 45% of residences (Bailie and Runcie 2001).

The 2008 NATSISS also showed that 25% of Aboriginal and Torres Strait Islander Australians lived in overcrowded conditions— higher among renters (30%) than homeowners (13%) (Australian Institute of Health and Welfare 2011). In contrast, the 2007–08 Survey of Income and Housing showed that only 4% of non-Indigenous Australians lived in overcrowded households (Australian Institute of Health and Welfare 2011). The proportion of Indigenous Australians living in overcrowded conditions increased with remoteness of location—58% of those living in very remote areas compared with 13% in Major cities

Aboriginal and Torres Strait Islander Australians are also more likely to be homeless than non-Aboriginal and Torres Strait Islander Australians. Based on the Census of 2006, a rate of 191 Aboriginal and Torres Strait Islander Australians per 10,000 population were homeless— nearly four times the non-Aboriginal and Torres Strait Islander rate (49 per 10,000) (Australian Institute of Health and Welfare 2011).

Housing and health

There is a substantial amount of research on the relationship between housing and health across the world. For example, in the United Kingdom in 1848, the first Public Health Act came into being in response to the rapid deterioration of the health of millions of working-class Britons, associated with their mass migration to the growing cities brought about by the industrial revolution. The only available housing was overcrowded, poorly ventilated, damp, and unhygienic with limited access to potable water and sub-standard waste and sewerage disposal (Shaw 2004). Outbreaks of diseases such as cholera became frequent.

An example of a study conducted closer to Australia, which may also be more pertinent to Victoria due to similar climatic conditions, is a longitudinal study of a cohort of 1,398 children born at a hospital in New Zealand in 2000 (Butler et al. 2003). Six weeks after birth, their

mothers were interviewed and asked about their health, assessed for postnatal depression, and asked to what extent their homes were cold and damp with or without mould. Using multiple logistic regression and adjusting for age, ethnicity, marital status, socioeconomic status (education and household income), household size, housing tenure, and financial difficulties with housing costs, the authors found a statistically significant association between damp and cold housing and maternal depression. They also found a statistically significant association between damp and cold housing and the incidence of asthma (Butler et al. 2003).

Housing and Aboriginal and Torres Strait Islander health

There is very little research on the potential health impacts of substandard housing on Aboriginal and Torres Strait Islander Australians and what there is, is largely based on studies conducted in remote Aboriginal and Torres Strait Islander communities which Victoria lacks (Bailie 2007). Moreover, these studies were based on remote Aboriginal and Torres Strait Islander communities in the Northern Territory and states such as Queensland which have very different climatic and environmental conditions to Victoria, necessitating different types of housing than perhaps would ever be built in Victoria.

The only publication that arose from this literature search in relation to housing and health in Victoria was a research summary published by the Victorian Health Promotion Foundation (VicHealth) (Mallett et al. 2011). The balance of the research confirms that overcrowding in Aboriginal and Torres Strait Islander households is an importance determinant of physical and mental health. However, the relationship between overcrowding and mental and physical health is not straight forward. The evidence suggests that if the person or persons who head the household can control the household space in terms of who enters the household, where they sleep, and the acceptable behavioural norms, overcrowding does not necessarily lead to poor mental and physical health (Mallett et al. 2011). Moreover, in some situations, high household occupancy can act as a protective factor for children against behavioural and emotional problems.

It was also observed that the security of housing tenure in Australia between those who own their own homes and those in public housing is similar, while those renting privately experienced the most insecure housing tenure that can lead to poor health outcomes (Mallett et al. 2011). Aboriginal and Torres Strait Islander Australians are significantly more likely to rent privately than non-Aboriginal and Torres Strait Islander Australians and therefore more likely to experience health consequences that may be due to insecure housing tenure (Mallett et al. 2011).

Update of literature from 2014-2019: A study published in 2018, appears to be the first study of the association between gastrointestinal infection and housing in an exclusively urban Aboriginal and Torres Strait Islander population in Australia (Andersen et al. 2018)

The study recruited 1,398 Aboriginal and Torres Strait Islander children through four Aboriginal Community Controlled Health Services in urban New South Wales between 2007

and 2011. Housing was assessed by whether: it had any major plumbing, electrical or structural problems; damp or mildew, or vermin; was heated adequately when needed; and/or was overcrowded.

The study found that children who lived in houses with three or more problems were significantly more likely to have ever experienced recurrent gastroenteritis as those who lived in a house with 0-2 problems (Prevalence Ratio = 2.5; 95% CI: 1.6-4.2). This was after controlling for age, sex, location of recruitment, household income, carer psychological distress, prenatal maternal and current household smoking, whether breastfed and for how long, ever attended childcare or pre-school, and daily fruit and vegetable intake.

When housing quality was treated as a continuous variable, the prevalence of recurrent gastroenteritis significantly increased with the number of housing problems by a factor of 1.3 (1.1-1.5), after controlling for the potential confounders described above.

The authors concluded that there was an independent and dose-dependent association between recurrent gastrointestinal infection and poor-quality housing among urban Aboriginal and Torres Strait Islander children (Andersen et al. 2018).

Overall, the collective evidence suggests that housing and health are associated and therefore housing may be an important determinant of health for Aboriginal and Torres Strait Islander Australians who are more likely to live in poor-quality housing.

Social capital

Background

Although not specifically mentioned by name in the WHO list of social determinants, social capital encompasses the concepts of social exclusion and social support, which are listed. Social capital is a property of the social environment in which one lives, and its presence or absence is generally agreed to be an important determinant of health (Mignone 2009).

Although the research on the concept of social capital was only applied to Indigenous peoples as late as 2000, the Canadian authors of a discussion paper for the WHO Commission on the Social Determinants of Health advocated for social capital to be incorporated as an important social determinant of health for First Nations peoples (Mignone 2009).

There is no universally agreed definition of social capital because it is a concept that traverses many disciplines such as sociology, economics, political science, psychology and population health. However, a simple definition of social capital is the 'resources that are accessed by individuals as a result of their membership of a network or a group' (Kawachi and Berkman 2014).

The concept of social capital originated in the field of sociology in the late 1980s with the work of Bourdieu, who posited that social capital is made up of social obligations and connections that are convertible, in certain conditions, to economic capital that can be accumulated by

the individual (Kawachi and Berkman 2014). It exists at the individual level as well as the community level.

While the concept has been developed by many since Bourdieu's work, it is beyond the scope of this literature review to detail the many different perspectives on social capital. However, an important development of the concept of social capital is that it is largely agreed that there are three types of social capital—Bonding, bridging and linking social capital (Szreter and Woolcock 2004).

Bonding social capital describes the strong trusting cooperative relationships between members of a network who see themselves as similar. That is, relations between relatively homogenous groups such as families and ethnic groups.

In contrast, bridging social capital describes the weaker but more cross-cutting trusting cooperative relationships between members of a network who do not see themselves as similar. For example, they might differ by age, socioeconomic status or ethnicity.

Linking social capital describes trusting cooperative relationships between people in positions of power and those within a hierarchy with different levels of power. In other words, linking social capital is connections across social strata that are good for accessing support from formal institutions. Linking social capital thereby brings state-society relations and considerations of power into the social capital framework (Szreter and Woolcock 2004).

In the context of Aboriginal and Torres Strait Islander communities, bonding social capital refers to relationships within the Aboriginal and Torres Strait Islander community, bridging social capital to relationships between the Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander communities, and linking social capital to relationships between the Aboriginal and Torres Strait Islander community and the formal institutions of power, such as governments (Mignone 2009).

Social capital and health

There is strong and consistent evidence of an association between social capital and health (Ikeda and Kawachi 2010). Higher levels of social capital are associated with a lower incidence of, and mortality due to cardiovascular disease. Social capital also appears to have a protective effect against cognitive decline. The findings with cancer are mixed, with some studies showing a protective effect while others not. Overall, a dose-response relationship between all-cause mortality and the level of social capital has been observed, where the higher the level of social capital an individual has, the lower their risk of mortality (Ikeda and Kawachi 2010).

A meta-analytic review of 148 studies showed a 50 per cent increased likelihood of survival among people with strong social capital equivalent in strength to quitting smoking (Holt-Lunstad et al. 2010). A lack of social capital has also been shown to be associated with a higher prevalence of behavioural risk factors (Lindstrom 2008).

Social capital is also associated with better mental health in children and adolescents, as well as adults (McPherson et al. 2014) (Welsh and Berry 2009). Moreover, a recent systematic review of 39 studies showed that social capital significantly reduces the risk of developing a common mental health disorder such as anxiety or depression (Ehsan and De Silva 2015).

However, not all social capital is good. From a societal perspective, the importance of linking social capital was highlighted by Woolcock and Narayan who observed that low linking social capital in the form of weak, hostile or indifferent governments can profoundly impact on the amount and mix of both bonding and bridging social capital at the community level (Woolcock and Narayan 2000). These societies have strong bonding social capital but little bridging social capital and tend to be divided, troubled, and dominated by the more powerful groups at the expense of everyone else.

At the individual level, strong bonding social capital can exclude outsiders, restrict individual freedoms, confer excessive and burdensome responsibilities on some members of the group, and drive the downward levelling of social norms (Kawachi and Berkman 2014).

Social capital and Aboriginal and Torres Strait Islander health

Table 1.4 summarises the studies across Australia that investigated social capital and some measure of health by Aboriginal and Torres Strait Islander status. The literature search identified a total of four studies—two qualitative studies (Brough et al. 2006) (Browne-Yung et al. 2013) and two cross-sectional surveys (Berry 2009) (Biddle 2012). In addition, there were two literature reviews, published as chapters in two books on the social determinants of Aboriginal and Torres Strait Islander health (Brough et al. 2007) (Baum 2007).

Table 1.4: Studies of social capital among Aboriginal and Torres Strait Islander Australians

Author and Year	Location	Study design	Findings
Brough et al 2006	Brisbane, Ipswich, and Logan in Queensland	Qualitative – 100 urban Aboriginal and Torres Strait Islander adults non-randomly selected to participate in 20 focus group discussions and 17 in-depth interviews.	<ul style="list-style-type: none"> • Bonding social capital exists between Aboriginal and Torres Strait Islander peoples and their communities but there is a lack of bridging social capital. • Documented the tension between having a strong Aboriginal and Torres Strait Islander identity while trying to fit into non-Aboriginal and Torres Strait Islander cultural spaces—a common source of stress. • Racism towards Aboriginal and Torres Strait Islander peoples was a barrier to developing bridging social capital.
Brough et al 2007	Australia	Literature review	<ul style="list-style-type: none"> • Questioned the concept of social capital being applied to Aboriginal and Torres Strait Islander Australians since it is predicated on the assumption that civic participation is good, but the problem remains as to whose standards this should be measured by – Aboriginal and Torres Strait Islander or non-Aboriginal and Torres Strait Islander. • Aboriginal and Torres Strait Islander Australians face a choice between participation within the dominant Anglo-Celtic culture or their own communities. For example, participation in higher education can result in a loss of connection to their Aboriginal and Torres Strait Islander community. • There is a tension for Aboriginal and Torres Strait Islander Australians in effectively ‘choosing’ between bonding and bridging social capital.
Baum 2007	Australia	Literature review	<ul style="list-style-type: none"> • While there are problems with the concept of social capital it does offer an understanding on how to improve Aboriginal and Torres Strait Islander health status • Racism appears to be a significant barrier to strong bonding and bridging social capital. • The result is an increasing number of Aboriginal and Torres Strait Islander peoples who feel a sense of alienation which may be partly responsible for the growing suicide rate.

Author and Year	Location	Study design	Findings
			<ul style="list-style-type: none"> • Tackling racism may be an important for building bridging social capital in Australia. • The reconciliation movement aims to build bridging social capital by building links between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Australians. • There is an absence of linking social capital among Aboriginal and Torres Strait Islander Australians. • Improvements in Aboriginal and Torres Strait Islander health could be made by building linking social capital. This would require non-Aboriginal and Torres Strait Islander peoples in positions of power engaging with Aboriginal and Torres Strait Islander peoples in a manner that is respectful of Aboriginal and Torres Strait Islander culture and recognises the impact of two hundred years of racism and marginalisation.
Berry 2009	Rural coastal community in southern New South Wales	Cross-sectional survey of 963 participants randomly selected from the electoral role.	<ul style="list-style-type: none"> • Greater social capital overall was strongly associated with less distress and greater happiness, particularly for Aboriginal and Torres Strait Islander Australians. • Unlike new and other Australians, civic engagement was not related to distress or happiness among Aboriginal and Torres Strait Islander Australians, but higher levels of political participation were related to greater distress. • Social capital may be particularly important for Aboriginal and Torres Strait Islander Australians.
Biddle 2012	Australia	Cross-sectional population-representative survey – 2008 National Aboriginal and Torres strait Islander Social Survey (NATSISS).	<ul style="list-style-type: none"> • High levels of social capital were associated with greater subjective wellbeing. • Aboriginal and Torres Strait Islander peoples living in remote Australia had higher levels of social capital than those living in non-remote Australia. • Encouraging Aboriginal and Torres Strait Islander Australians to relocate from remote to non-remote areas as a solution to unemployment and

Author and Year	Location	Study design	Findings
			low levels of education could come at a cost in lowering social capital and reducing subjective wellbeing.
Browne-Yung et al 2013	Urban Adelaide, South Australia	Qualitative – non-randomly selected face-to-face semi-structured interview of 152 Aboriginal and Torres Strait Islander people.	<ul style="list-style-type: none"> • Bonding social capital had positive and negative effects on health and wellbeing. • Barriers to bridging and linking social capital included racism and unequal cultural and economic capital.

Overall, greater health and wellbeing were associated with high levels of social capital among Aboriginal and Torres Strait Islander Australians, although Browne-Yung et al (2013) also acknowledged the existence of negative impacts on health and wellbeing with high levels of bonding social capital.

All studies identified strong bonding social capital among Aboriginal and Torres Strait Islander Australians but low bridging social capital, while Baum (2007) reported that there was an absence of linking social capital among Aboriginal and Torres Strait Islander Australians. However, Brough et al (2007) questioned whether social capital was as beneficial for Aboriginal and Torres Strait Islander Australians as non-Aboriginal and Torres Strait Islander Australians given that social capital theory assumes that civic participation is good. Yet many Aboriginal and Torres Strait Islander peoples felt that they had to choose between their communities and the dominant Anglo-Celtic culture, with the potential consequence being a loss of bonding social capital.

Brough et al (2006), Baum (2007), and Browne-Yung et al (2013) provided or cited evidence that racism towards Aboriginal and Torres Strait Islander Australians is a significant barrier to building bridging social capital.

However, most of the studies in Table 1.4 were cross-sectional or qualitative and are therefore not designed to make any assertions about causality or its direction(s).

Update of literature from 2014-2019:

A report commissioned by the WHO Regional Office for Europe in 2015 reviewed 37 systematic reviews and meta-analyses of studies that investigated the role of psychosocial factors in morbidity and mortality from cardiovascular disease and cancer (Pikhart and Pikhartova 2015). This included looking at the impact of low social support and low trust—measures of social capital. The authors concluded that the strength and consistency of the findings support the hypothesis that psychosocial factors are causal risk factors for cardiovascular disease and cancer.

Psychosocial risk factors

Background

Psychosocial risk factors have been variously defined. The Oxford English dictionary defines psychosocial as “*pertaining to the influence of social factors on an individual’s mind or behaviour, and to the interrelation of behavioural and social factors*” (Martikainen, Bartley et al. 2002). Often, responses to psychosocial risk factors such as stress, depression, anxiety, and psychological distress have also been described as psychosocial risk factors (Macleod and Davey Smith 2003). However, the growing consensus is that psychosocial risk factors are any exposure that may influence physical health through a psychological mechanism (Macleod and Davey Smith 2003).

An additional consideration is that a stressful life event such as finding oneself unexpectedly unemployed leading to a loss of income, is not necessarily a psychosocial risk factor unless it

is perceived to be (Martikainen et al. 2002). Therefore, if the experience of unemployment leads to a loss of self-esteem and anxiety that can potentially affect health through psychobiological processes and/or the uptake of potentially health-damaging behaviours in response, then it can be said to be a psychosocial risk factor (Martikainen et al. 2002).

Psychosocial risk factors and Aboriginal and Torres Strait Islander health

Table 1.5 summarises the studies of psychosocial risk factors that may affect Aboriginal and Torres Strait Islander health identified in the literature search. There were very few peer-reviewed published studies, as most of the literature was grey literature. The literature research identified the following: a federal government national strategic framework for Aboriginal and Torres Strait Islander mental health and social and emotional wellbeing (Social Health Reference Group 2004); a peer-reviewed qualitative study conducted in Victoria (Reilly et al. 2008); a discussion paper by the Cooperative Research Centre for Aboriginal and Torres Strait Islander Health (Kelly et al. 2009); and a chapter of a book by the Australian Institute of Health and welfare (Zubrick et al. 2010).

Table 1.5: Studies of the health of Aboriginal and Torres Strait Islander Australians by psychosocial risk factors

Author and Year	Location	Study design	Findings
Social Health Reference Group (SHRG) 2004	Australia	Australian government document	<ul style="list-style-type: none"> • In 2004 the Australian government published the Social and Emotional Well Being Framework: a national strategic framework for Aboriginal and Torres Strait Islander mental health and social and emotional wellbeing 2004-2009. • In partnership with the National Aboriginal Community Controlled Health Organisation (NACCHO), the Aboriginal Health and Medical Research Council of NSW, the Centre for Mental Health within NSW Health, and the National Advisory Group for Aboriginal and Torres Strait Islander Health Information and Data of the Australian Bureau of Statistics, a range of questions on the social and emotional wellbeing and mental health questions were agreed upon to be included for the first time in the 2004-05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) survey. • There is no reference to or discussion of how this was achieved other than stating that Aboriginal and Torres Strait Islander peoples identified the determinants influencing their wellbeing. These were listed as: unresolved grief and loss; trauma and abuse; domestic violence; removal from family; substance misuse; family breakdown; cultural dislocation; racism and discrimination; and social disadvantage.
Reilly et al 2008	Victoria	Qualitative study. In-depth interviews of 30 non-randomly selected Aboriginal and Torres Strait Islander men and women aged 18-62 years who lived in rural Victoria	<ul style="list-style-type: none"> • Identified several major factors that they believed were responsible for the high levels psychosocial stress. • These included the traumatic history of Aboriginal and Torres Strait Islander Australia since colonisation which has manifested itself in ongoing trauma due to the ongoing separation from the land and cultural practices, racial discrimination, lack of control or mastery over their lives, marginalisation, lack of employment and educational opportunities, boredom leading to alcohol and drug abuse, and high mortality rates. • The consequences of these psychosocial risk factors were identified as low self-esteem, depression, chronic grief, and alienation from and mistrust of non-Aboriginal and Torres Strait Islander peoples and institutions.

Author and Year	Location	Study design	Findings
Kelly et al 2009	Australia	<p>Cross-sectional population-representative surveys: 2004-05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS); 2002 Western Australian Aboriginal Child Health Survey (WAACHS); and 2006 General Social Survey (GSS). Also reported on data from administrative datasets, e.g. police statistics.</p>	<ul style="list-style-type: none"> • A discussion paper prepared by the newly formed Australian Indigenous Psychologists Association based on the trialling of the first module of the social and emotional wellbeing in the 2004-05 NATSIHS. • The authors reference the emerging body of evidence that has moved the World Health Organization to recognise psychological distress as a major social determinant of morbidity and mortality. • The 2004-05 NATSIHS used the modified Kessler 6 Psychological Distress Scale, that was further modified by removing a question considered to be culturally inappropriate, to measure psychological distress. • The 2004-05 NATSIHS showed that 27% of Aboriginal and Torres Strait Islander Australians has serious psychological distress—twice that of 13% of non-Aboriginal and Torres Strait Islander Australians (2006 GSS). • The higher the level of psychological distress, the greater the number of days a person was unable to perform their usual role(s). • 2004-05 NATSIHS participants were asked about 15 possible stressors that they may have experienced in the 12 months prior to the survey. • Aboriginal and Torres Strait Islander Australians were 1.4 times more likely to experience stressful life events than non-Aboriginal and Torres Strait Islander Australians and the risk exposure for each of the stressful life events ranged from two to five times greater for Aboriginal and Torres Strait Islander Australians. • As the number of stressful life events experienced by Aboriginal and Torres Strait Islander Australians went up, so did the level of psychological distress. However the relationship between serious psychological distress and number of stressors was not a linear relationship—the proportion of Aboriginal and Torres Strait Islander Australians who had serious psychological distress peaked in those who reported 8-11 stressful events (46%) and then declined in those who experienced the maximum number of stressful events (35%). • Grief and loss: <ul style="list-style-type: none"> ○ was the largest single risk factor with 47% of Aboriginal and Torres Strait Islander adults having lost a relative or friend in the last 12 months—2.4 times higher than for non-Aboriginal and Torres Strait Islander Australians.

Author and Year	Location	Study design	Findings
			<ul style="list-style-type: none"> ○ 70% of these deaths occurred in Aboriginal and Torres Strait Islander peoples under the age of 65 years, compared with 21% of deaths of non-Aboriginal and Torres Strait Islander Australians. ○ Deaths related to poor quality medical care occurred at four times the rate among Aboriginal and Torres Strait Islander compared with non-Aboriginal and Torres Strait Islander Australians. ○ Aboriginal and Torres Strait Islander infants died at three times the rate of non-Aboriginal and Torres Strait Islander infants. ● Child removals by a mission or government (Stolen Generations): <ul style="list-style-type: none"> ○ 8% reported that they had been taken away and 43% reported that a relative had been taken away. ○ This was associated with serious psychological distress. ○ The 2002 WAACHS found that children who had Aboriginal and Torres Strait Islander Australians carers who had been removed from their families were twice as likely to be at high risk of clinically significant emotional or behavioural difficulties as those who had not. ● Economic and social disadvantage: <ul style="list-style-type: none"> ○ 54% of Aboriginal and Torres Strait Islander Australians experienced financial stress compared with 13% of non-Aboriginal and Torres Strait Islander Australians. ○ 40% of Aboriginal and Torres Strait Islander households had insufficient money to pay for basic living expenses such as food and rent and were twice as likely to have serious psychological distress. ● Physical health problems: <ul style="list-style-type: none"> ○ 28% of Aboriginal and Torres Strait Islander Australians had a serious illness or disability compared with 7% of Non-Aboriginal and Torres Strait Islander Australians. ○ 62% of Aboriginal and Torres Strait Islander Australians who reported having four or more health conditions had serious psychological distress. ● Incarceration:

Author and Year	Location	Study design	Findings
			<ul style="list-style-type: none"> ○ 19% of Aboriginal and Torres Strait Islander Australians reported having a family member sent to jail—13 times more likely than non-Aboriginal and Torres Strait Islander Australians. ○ The two most important reasons for Aboriginal and Torres Strait Islander imprisonment were high-risk alcohol consumption and illicit drug use. ○ Therefore, incarceration was both a risk factor and an outcome of serious psychological distress and mental health problems. ○ 40-61% of Aboriginal and Torres Strait Islander prisoners had received previous psychiatric treatment and half had a history of being removed from their families. ○ 16% of Aboriginal and Torres Strait Islander Australians reported trouble with police compare with 3% of non-Aboriginal and Torres Strait Islander Australians. ● Child removal by care and protection orders: <ul style="list-style-type: none"> ○ Nearly one in 10 Aboriginal and Torres Strait Islander families were subject to investigations about how they cared for their children—four times higher than non-Aboriginal and Torres Strait Islander families. ○ Only 25% of those investigations were substantiated. ○ No data is available on the psychological distress experienced by those families that were exonerated of neglect or abuse. ○ This varied by jurisdiction with Victoria having the highest rate of care and protection orders. ● Juvenile justice supervision: <ul style="list-style-type: none"> ○ Aboriginal and Torres Strait Islander children aged 10-17 years were 27 times more likely than non-Aboriginal and Torres Strait Islander children to be placed under juvenile justice supervision. ○ This varied by jurisdiction with Western Australia being 42 times more likely to place Aboriginal and Torres Strait Islander young peoples under juvenile justice supervision than non-Aboriginal and Torres Strait Islander children. ● Violence: <ul style="list-style-type: none"> ○ 15% of Aboriginal and Torres Strait Islander Australians had witnessed violence in past 12 months—5 times the rate in non-Aboriginal and Torres Strait Islander Australians.

Author and Year	Location	Study design	Findings
			<ul style="list-style-type: none"> ○ Aboriginal and Torres Strait Islander Australians were three times more likely to report a recent injury inflicted by another person. ○ Violence among Aboriginal and Torres Strait Islander Australians was associated with mental illness and substance abuse. ● Substance use/abuse: <ul style="list-style-type: none"> ○ Aboriginal and Torres Strait Islander Australians being just as likely as non-Aboriginal and Torres Strait Islander Australians to engage in risky drinking. ○ However, Aboriginal and Torres Strait Islander Australians were 43 times more likely to be taken into custody for public drunkenness than non-Aboriginal and Torres Strait Islander Australians. ○ Of those who engaged in risky drinking, Aboriginal and Torres Strait Islander Australians were 10 times more likely than non-Aboriginal and Torres Strait Islander Australians to die from mental and behavioural disorders due to alcohol use. ○ However, there was no association between Aboriginal and Torres Strait Islander Australians who drank at long-term high-risk levels and serious psychological distress. ● Overcrowding at home: five times higher among Aboriginal and Torres Strait Islander Australians than non-Aboriginal and Torres Strait Islander Australians. ● Interpersonal and institutional racism and discrimination: 11.6% of Aboriginal and Torres Strait Islander Australians in urban areas and 13% of Aboriginal and Torres Strait Islander Australians in remote areas experienced discrimination.
Zubrick et al 2010	Australia	Cross-sectional population-representative surveys – 2004-05 NATSIHS and 2002 and 2008 National Aboriginal and Torres Strait Islander Social Surveys (NATSISS).	<ul style="list-style-type: none"> ● Investigated the relationship between risk factors and Aboriginal and Torres Strait Islander social and emotional wellbeing and although the paper repeats much of the findings reported by Kelly et 2009, it makes a further contribution. ● The report emphasizes the role of racism as an important psychosocial risk factor of Aboriginal and Torres Strait Islander health and wellbeing, citing a paper presented at the 2007 Rural Health Research Colloquium in Tamworth, NSW. The author, Yin Paradies, analysed the 2004-05 NATSIHS data and found that perceived racism among Aboriginal and Torres Strait Islander Australians was associated with poor self-assessed health status, psychological distress, diabetes, smoking, and substance abuse.

Kelly et al (2009) noted that while single risk factors may have a minimal effect, it is the cumulative effect of multiple risk factors over time that appears to be health damaging (Kelly, Dudgeon et al. 2009). Kelly et al (2009) also notes that Aboriginal and Torres Strait Islander Australians who suffer psychological distress “...*appear to be at increased risk of being subject to a punitive rather than supportive intervention—such as incarceration and removal of children. Rather than creating new opportunities for recovery or building on strengths, these have served to exacerbate distress and to increase the risk of developing serious psychological distress. It therefore seems likely that these system failures may also serve as determinants of serious psychological distress*” (Kelly et al. 2009).

Overall, there is a paucity of literature on the psychosocial risk factors of Aboriginal and Torres Strait Islander health and what there is, is limited to identifying psychosocial stressors that may impact on health. The majority of the quantitative literature that attempts to connect the identified psychosocial stressors with health is based on finding simple statistical associations between potential psychosocial stressors and measures of health or other health risk factors, predominantly psychological distress, from the national Aboriginal and Torres Strait Islander surveys. Moreover, all of the studies in Table 4 were cross-sectional or qualitative and are therefore not designed to make any assertions about causality or its direction(s).

Update of literature from 2014-2019:

As previously discussed in the updated section on social capital, a report commissioned by the WHO Regional Office for Europe in 2015 which reviewed 37 systematic reviews and meta-analyses of studies from across the world, concluded that the balance of the evidence supports the hypothesis that psychosocial factors are causal risk factors for cardiovascular disease and cancer (Pikhart and Pikhartova 2015). The report examined a number of psychosocial risk factors including low social capital, high job demand, low autonomy, low control, or high effort–reward imbalance, interpersonal conflicts, mastery, depression, anger, and hostility (Pikhart and Pikhartova 2015).

Racism

Background

While racism qualifies as a psychosocial risk factor, this psychosocial risk factor is treated separately because racism is a unifying theme across all the social determinants of health and therefore warrants a more detailed examination in and of itself (Vickery et al. 2007).

Racism is variously defined. From a societal perspective racism can be defined as “... *as organized systems within societies that cause avoidable and unfair inequalities in power, resources, capacities and opportunities across racial or ethnic groups*” (Paradies et al. 2015).

Racism occurs at many levels: (1) the societal level where institutions through policies and practices maintain and reproduce unfair outcomes for marginalised groups, also called ‘systemic’ racism; (2) interpersonal interactions between individuals whether in their roles in

institutions or in private life; and (3) internalised, where an individual internalises the negative views about the group that they belong to (Ziersch et al. 2011). It is important to note that racism is not necessarily conscious or intentional and does not need to be so in order to be harmful to those on the receiving end.

Racism and health

A systematic review of the international literature from 1980 to 2004 identified 138 quantitative studies of racism and health (Paradies 2006). 65% of these studies were published in the period 2000-2014 and another 26% were published in the period 1995-1999, indicating that this is a relatively recent area of scholarship. The majority (86%) of studies were conducted in the United States and were of cross-sectional design (76%)—only two were from Australia and New Zealand. 12% of the studies were of a longitudinal design.

Health outcomes were grouped into broad categories and of these, 72% showed a statistical association with poor mental health while the remaining 28% failed to find an association. In contrast, only 36% showed a statistical association with negative physical health while the remaining 63% failed to find an association. Some studies also looked at the relationship between racism and health risk factors such as substance abuse and smoking—62% showed a positive association with health risk factors, while the remaining 38% found no association. Overall, most studies adjusted for the potential confounding effect of age, gender, and socioeconomic status (Paradies 2006).

The authors concluded that there is strong evidence that racism is associated with poor mental health and health risk factors, and weak evidence that it is associated with poor physical health (Paradies 2006). The authors also concluded that since similar findings were observed in the studies of longitudinal design, there is also evidence that experiences of racism preceded ill-health, suggesting a causal pathway from racism to ill-health.

A second systematic review of the international literature identified 192 studies relating racism to a health outcome, published between 1986 and 2007 (Pascoe and Smart Richman 2009). The authors performed a meta-analysis of 110 studies that had sufficient data on the zero-order relationship between racism and mental health outcomes, such as depression, anxiety, psychological distress, life satisfaction, indicators of psychosis and so forth. After weighting for sample size, the average correlation under a random effect model was -0.20 (95% CI: -0.20 to -0.17), confirming that experiences of racism were statistically significantly related to negative mental health outcomes.

36 studies also had sufficient data for a meta-analysis of the zero-order relationship between racism and physical health outcomes, such as cardiovascular risk factors (blood pressure, intramedial thickness, plaque, and heart rate variability), general indicators of illness (e.g., nausea, pain and headaches), and a number diseases and conditions (e.g., hypertension, cardiovascular disease, diabetes, respiratory conditions). After weighting for sample size, the average correlation under a random effect model was -0.13 (95% CI: -0.16 to -0.10), indicating

that experiences of racism were statistically significantly related to negative physical health outcomes. There was no significant difference between the correlation coefficients for mental or physical health. Adjusting for a variety of confounders such as socioeconomic status, age, gender, ethnicity, education, income, marital status, and employment did not significantly impact on the findings. The authors conclude that there is strong evidence that experiences of racism are associated with both poor mental and physical health (Pascoe and Smart Richman 2009).

Racism and Aboriginal and Torres Strait Islander health

A literature search by Morrissey et al (2007) of the ATSIHealth database under the keyword 'racism' between 1994 and 2004 identified only 20 citations, and most only addressed the topic superficially (Morrissey et al. 2007).

Table 1.6 summarises eight studies of racism and Aboriginal and Torres Strait Islander health published between 1999 and 2013. Of these, there was a discussion paper by the Cooperative Research Centre for Aboriginal Health (Paradies et al. 2008), a government funded report (Ferdinand et al. 2012), and 6 peer-reviewed publications (Larson et al. 2007) (Priest et al. 2011a) (Priest et al. 2011b) (Ziersch et al. 2011) (Paradies and Cunningham 2012a) (Paradies and Cunningham 2012b).

Table 1.6: Studies of the health of Aboriginal and Torres Strait Islander Australians by experiences of racism

Author and year	Location	Study design	Findings
Larson et al 2007	Rural town in Western Australia	Cross-sectional survey of randomly selected residents (n=639) aged 18 years and older, 183 who identified as Aboriginal and Torres Strait Islander.	<ul style="list-style-type: none"> • Mental and physical health were measured using the Short-Form 12 (SF-12), general health was measured using the self-reported health status question, and experiences of racism were measured in the last 4 weeks. • Logistic regression modelling showed that Aboriginal and Torres Strait Islander respondents who experienced racism were significantly more likely to report being in fair or poor health than their non-Aboriginal and Torres Strait Islander counterparts (odds ratio (OR)=3.2; 95% CI: 1.3-8.2) after controlling for age, sex, and socioeconomic status. • Linear regression modelling showed that compared with their non-Aboriginal and Torres Strait Islander counterparts, Aboriginal and Torres Strait Islander respondents who experienced racism were significantly more likely to have lower SF-12 physical health component scores (β=-3.6; 95% CI: -6.5 to -0.7) and lower SF-12 mental health component scores, after controlling for age, sex, and socioeconomic status. • The authors conclude that racism should be considered a social determinant of Aboriginal and Torres Strait Islander health.
Paradies et al 2008	Australia	Cooperative Research Centre for Aboriginal Health (CRAH) discussion paper.	<ul style="list-style-type: none"> • In response to the lack of research on racism and Aboriginal and Torres Strait Islander ill health, a symposium was convened by Dr Yin Paradies and sponsored by the CRAH. • The aim of the symposium was to develop key research questions in this area. • The paper cites studies that showed that Aboriginal and Torres Strait Islander patients were significantly less likely to receive appropriate medical care across all conditions, as well as for particular diseases such as lung cancer and coronary procedures, and to receive kidney transplants, compared with non-Aboriginal and Torres Strait Islander patients with the same level of medical need. • Despite these findings, they were not matched by the perceptions of Aboriginal and Torres Strait Islander peoples about experiences of racism in healthcare settings. Respondents in the 2004-05 NATSIHS were asked about treatment when seeking healthcare and only 4% indicated that they felt they were treated worse than non-Aboriginal and Torres Strait Islander peoples, while 90% reported being treated the same.

Author and year	Location	Study design	Findings
			<ul style="list-style-type: none"> The authors concluded that this shows the covert nature of systemic racism in institutional settings.
Priest et al 2011a	Melbourne, Victoria	Cross-sectional survey data from Wave 1 of the Young People's Project (YPP). 172 Aboriginal and Torres Strait Islander youths aged 12-26 years were non-randomly recruited through an urban community-controlled health service in 1997-8.	<ul style="list-style-type: none"> 52.3% of participants reported experiencing racism. Racism was significantly associated with poor overall mental health (OR=2.67; 95% CI: 1.25-5.70), poor general health (OR=2.17; 1.03-4.57), and marginally associated with increased depression (OR=2.0; 0.97-4.09). Number of worries and number of friends were both found to be effect modifiers for the association between self-reported racism and overall mental health. Getting angry at racist remarks was found to mediate the relationship between self-reported racism and general health.
Priest et al 2011b	Darwin, Northern Territory	Cross-sectional study of 345 Aboriginal and Torres Strait Islander youth aged 16–20 years in 2006-8 who participated in wave 3 of the prospective Aboriginal Birth Cohort Study.	<ul style="list-style-type: none"> 32% of participants reported experiencing racism. Participants were assessed using the Strong Souls tool—designed to measure their social and emotional wellbeing. The 25-item tool included four domains: anxiety (six questions); depression (seven questions); suicide risk (three questions); and resilience (nine questions relating to social support, positive affect, and knowledge of “whitefella” ways). Racism was significantly associated with anxiety (OR=2.18; 1.37-3.46), depression (OR=2.16; 1.33-3.53), suicide risk (OR=2.32; 1.25-4.00) and poor overall mental health (OR=3.35; 2.04-5.51), after adjusting for relevant sociodemographic and substance-use confounders. No significant associations were found between racism and resilience, body mass index, or waist-to-hip ratio.
Ziersch et al 2011	Adelaide, South Australia	Qualitative study: face-to-face interviews of 153 non-randomly selected urban Aboriginal and Torres Strait Islander	<ul style="list-style-type: none"> 93% of participants regularly experienced racism. Two-thirds of Aboriginal and Torres Strait Islander participants felt that racism affected their health and identified both emotional and physiological reactions.

Author and year	Location	Study design	Findings
		people conducted in 2006-07	<ul style="list-style-type: none"> Commonly cited responses to racism included seeking social support, confrontation, ignoring the situation, minimising its significance, and consuming alcohol, tobacco, and other drugs. The authors conclude that both racism and some responses to racism can be health damaging.
Paradies and Cunningham 2012a	Darwin Northern Territory	Cross-sectional study - the Diabetes and Related conditions in Urban Indigenous people in the Darwin, Australia region (DRUID) study. 1,004 participants aged 15 years and older were non-randomly recruited through family and community networks, and health centres.	<ul style="list-style-type: none"> 185 participants in the DRUID study were asked about experiences of racism. Depression was assessed using the Centre for Epidemiologic Studies Depression Scale. Hierarchical regression modelling with depression as the outcome variable showed that experiences of racism were significantly associated with depression after adjusting for age, sex, household composition, marital status, household income, housing tenure and education ($\beta = 0.08$, $p < 0.001$). Lack of control over life, stress, negative social connections and feeling ashamed, amused, or powerless as reactions to racism accounted for 66% of the association between experiences of racism and depression.
Paradies and Cunningham 2012b	Darwin Northern Territory	Cross-sectional study - the DRUID study.	<ul style="list-style-type: none"> A total of 164 adults in the DRUID study were asked about experiences of racism. Self-assessed health status was measured using the SF-12 (Medical Outcomes Study Short Form-12). Hierarchical regression modelling with racism as the outcome variable showed that after adjusting for socio-demographic factors, experiences of racism were significantly associated with the mental health component of the SF-12, but not the physical health component.
Ferdinand et al 2012	Four local government areas in Victoria	Cross-sectional study -the 2011 Localities Embracing and Accepting Diversity (LEAD) Experiences of Racism Survey. 755	<ul style="list-style-type: none"> 95% of participants had experienced racism in past 12 months: 92% reported that the perpetrator was non-Aboriginal and Torres Strait Islander and 64% did not know the perpetrator. Most commonly experienced in shops (67%) and public spaces (59%), followed by educational settings, sports, and employment settings.

Author and year	Location	Study design	Findings
		Aboriginal and Torres Strait Islander Victorians aged 18 years or older recruited non-randomly.	<ul style="list-style-type: none">• 66% were told that they did not belong in Australia indicating a high prevalence of social exclusion.• Using the Kessler 5 Psychological Distress Scale, there was a dose-related association between psychological distress and experiences of racism.• Passive responses to racism such as accepting or ignoring it were associated with higher levels of psychological distress.

The literature relating racism to Aboriginal and Torres Strait Islander health appears to be consistent with the international literature when the health outcome being examined is a measure of mental health. However, it is less consistent when the health outcome being examined is a measure of physical health.

Most of the studies described in Table 5 were cross-sectional which only allows the measurement of statistical association and cannot make any assertions about causality and its direction(s).

Update of literature from 2014-2019: Four additional studies were identified—three of which were based on longitudinal data.

The first study was a cross-sectional study that investigated hypothalamic-pituitary-adrenal (HPA)-axis function in a First Nations people—the first of its kind (Berger et al. 2017). When a person is exposed to a threatening situation, the body responds by activating the HPA-axis which stimulates the adrenal gland to secrete cortisol. Cortisol helps prepare the person's body to deal with the stressor in order to ensure survival. Once the threat is gone the body returns to normal.

However, if a person is repeatedly exposed to stress, alterations in the body's normal stress response occur that lead to pathological processes that can cause long-term illness. One of the markers of this pathological process is altered cortisol levels, manifested by an attenuated cortisol awakening response where the person's morning cortisol level is abnormally low.

The study investigated the cortisol levels of 26 Aboriginal and Torres Strait Islander and 26 non-Aboriginal and Torres Strait Islander university students matched for age and gender, in Queensland, Australia. The students were exposed to acute stress, brought about with a public speaking task. There was no difference in the cortisol levels of the Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander students in response to the laboratory induced acute stressor. However, the Aboriginal and Torres Strait Islander students showed a blunted cortisol awakening response that the non-Aboriginal and Torres Strait Islander students did not, and this was strongly associated with self-reported experiences of racial discrimination. The authors concluded that chronic stress due to racism may be responsible for the alterations in the cortisol awakening response observed in the Aboriginal and Torres Strait Islander students (Berger et al. 2017).

The second study investigated the negative impacts of racism on the health of Aboriginal and Torres Strait Islander children aged 5-10 years using longitudinal data from waves 1-6 (2008-2013) of the Longitudinal Study of Indigenous Children (LSIC) (Shepherd et al. 2017). The study found that primary carer and child experiences of racism were each associated with poor child mental health status, sleep difficulties, obesity, and asthma, but not with child general health or injury. Moreover, children that experienced persistent racism were more likely to have sleep difficulties and asthma than children with a time-limited exposure. The authors

concluded that direct and persistent racism is a physical and mental health risk to Aboriginal and Torres Strait Islander children (Shepherd et al. 2017).

The third study investigated the negative health impacts of caregiver-perceived racism on Aboriginal and Torres Strait Islander children (Cave et al. 2019). The study was based on longitudinal data from waves 2-8 (2009-2015) of the LSIC study. Children who were exposed to caregiver-perceived racism when they were between 4 and 11 years were assessed for mental health outcomes at ages 7–12, and substance use at ages 10–12 years.

The Strengths and Difficulties Questionnaire (SDQ) was used to measure both positive and negative emotional and behavioural outcomes, questions about smoking or alcohol use were used to determine substance use, and physical health was determined by asking about general health and obtaining height and weight measurements to compute body mass index.

Multivariable logistic regression modelling adjusted for age, gender, and socioeconomic status revealed that 20.4% of children experienced at least one exposure to caregiver-perceived racism, and this was associated with the children being about twice as likely to be in poor mental health, have sleep difficulties, have behaviour issues at school, and trying alcohol. The children were also seven times more likely to have tried smoking (Cave et al. 2019).

The fourth study investigated the impacts of exposure to racial discrimination and bullying victimisation on the social, emotional, and physical health of adolescents aged 10-11 years who were participants in three waves of the Longitudinal Study of Australian Children (LSAC) from 2010-2014 (Priest et al, 2019).

Physical health was measured by body mass index (BMI) and social and emotional health was measured using the parent-reported Strengths and Difficulties Questionnaire (SDQ). Higher accumulated exposure to both racial discrimination and bullying victimisation was significantly associated with higher social and emotional difficulties ($\beta=2.68$; 95% CI: 1.36-4.00), increased BMI z-scores ($\beta=0.19$; 0.02-0.36), and risk of being overweight (Prevalence Rate Ratio = 2.05; 1.42-2.96), adjusting for socioeconomic status, sex, ethnicity, and prior social and emotional difficulties. Aboriginal and Torres Strait Islander adolescents were most likely to be the recipients of racial discrimination and bullying victimisation (Priest et al. 2019).

Connection to culture and country

Background

Connection to culture has been identified as an important determinant of Aboriginal and Torres Strait Islander social and emotional health and wellbeing (Social Health Reference Group 2004) (Morrissey et al. 2007) (King et al. 2009). Similarly, connection to country, which is the term used by Aboriginal and Torres Strait Islander Australians to refer to their traditional homelands, is also an important determinant of health (Burgess and Morrison 2007).

A previous literature review noted that 'culture' has been variously defined and found no less than 164 different definitions used by anthropologists (Morrissey et al. 2007). The concept of 'culture' has been pervasive in health policy over the last 50 years as a means of explaining the health and behaviour of Aboriginal and Torres Strait Islander Australians and migrants. However, most of the research that stresses the importance of cultural factors on Aboriginal and Torres Strait Islander health subsequently fails to investigate the social processes involved.

Connection to culture, country, and Aboriginal and Torres Strait Islander health

Evidence linking connection to culture and country with health is summarised in Table 1.7. These included: a discussion paper by the Cooperative Research Centre for Aboriginal Health (Kelly et al. 2009) and 6 peer-reviewed articles (McDermott et al. 1999) (Rowley et al. 2008) (Burgess et al. 2009) (Kingsley et al. 2009) (Dockery 2010) (Dockery 2011).

While inclusion of studies set in remote Aboriginal and Torres Strait Islander populations was an exclusion criterion in this literature review, an exception was made in this case. This is because the evidence for connection to country being an important determinant of Aboriginal and Torres Strait Islander health can only come from comparing Aboriginal and Torres Strait Islander peoples who are connected to their country with those who are not. Aboriginal and Torres Strait Islander peoples who are connected to country predominantly reside in remote areas of the Northern Territory and Central Australia.

Table 1.7: Studies of the health of Aboriginal and Torres Strait Islander Australians by connection to culture and country

Author and Year	Location	Study design	Findings
McDermott et al 1999	Central Australia	Baseline survey of 826 non-randomly selected Aboriginal and Torres Strait Islander adults in rural central Australian communities in 1987-88 with a follow-up survey of 416 adults (56% response rate, excluding deaths).	<ul style="list-style-type: none"> • A comparison of two areas. The first area was a centralised ex-mission community with a long history of acculturation—only 103 of 354 (29%) participants lived on homelands or ‘on country’. The second area consisted of decentralised ex-pastoral settlements where 432 of 478 participants (90%) lived on homelands or ‘on country’. • Compared with Aboriginal and Torres Strait Islander peoples living in the ex-mission centralised area, homelands residents: had a lower baseline prevalence of diabetes (risk ratio [RR]=0.77; 95% CI: 0.59-1.00); hypertension (RR=0.66; 0.54-0.80); overweight/obesity (RR=0.70; 0.59-0.83); a lower incidence of diabetes (RR=0.70; 0.46-1.06); lower mortality rate (RR=0.56; 0.37- 0.85) and were less likely to be hospitalised for any cause (RR=0.79; 0.71-0.87), particularly infections (RR=0.70; 0.61-0.80) and injury involving alcohol (RR=0.61; 0.47- 0.79); and a higher mean age at death (58 vs. 48 years). • Conclusion: Aboriginal and Torres Strait Islander peoples who lived on country in homelands had significantly better health than those living in more centralised settlements with a long history of acculturation. <p>*The homelands refer to a movement that began in the 1970s when government policy changed direction from assimilationist policies to policies that gave Aboriginal and Torres Strait Islander peoples more control over where they lived. Many small family groups thus chose to move back to their traditional homelands.</p>
Rowley et al 2008	Northern Territory (NT)	Community-based cohort of 296 non-randomly-selected Aboriginal and Torres Strait Islander peoples aged 15 years and older followed over 10 years who resided in remote communities.	<ul style="list-style-type: none"> • The Utopia community consists of 16 homelands dispersed over an area of about 10,000 km² where clan groups had gained freehold title in 1976. While there is no centralised settlement, there are administrative offices, a community-controlled health centre and a store. • Mortality was 964/100,000 person-years—significantly lower than that of the Aboriginal and Torres Strait Islander population of the entire Northern Territory (standardised mortality ratio [SMR] = 0.62; 95% CI: 0.42-0.89). • Mortality due to cardiovascular disease (CVD) in those aged 25 years or older was also lower but not significant at the p=0.05 level—SMR=0.52; 0.23-1.02. • The rate of hospitalisation for CVD was 13/1,000 person-years, compared with 33/1,000 person-years.

Author and Year	Location	Study design	Findings
			<ul style="list-style-type: none"> • All-cause mortality rates, while lower than the average for Aboriginal and Torres Strait Islander peoples in the NT, were still much higher than non-Aboriginal and Torres Strait Islander peoples in the NT. • Data from the 2006 Census indicated that the socioeconomic status was significantly lower in Utopia than for Aboriginal and Torres Strait Islander peoples in the NT—lower participation in the labour force, lower household income, lower level of educational attainment, and higher degree of overcrowding. • The authors attributed the better health of Aboriginal and Torres Strait Islander peoples in Utopia, despite greater socioeconomic disadvantage, to homeland living which offered greater physical activity, a healthier diet, limited access to alcohol, connection to culture, family and land, and opportunities for self-determination.
Kingsley et al 2009	Victoria	Qualitative study using semi-structured interviews and thematic analysis	<ul style="list-style-type: none"> • The study sought to identify the health and wellbeing benefits associated with caring for Country in three Victorian Indigenous groups: the Bangerang, Boonwurrung, and Yorta Yorta. • Thirteen adults (8 women and 5 men) were interviewed. 7 of the interviewees were traditional custodians regarded as respected members of the community and the remaining 6 were land management workers and environmental policy officers employed by government. • Key themes that arose from the interviews were that caring for Country built self-esteem, fostered self-identity, maintained cultural connection, and provided relaxation, enjoyment, and stress relief. • The authors concluded that caring for Country may offer an important means of improving the health and wellbeing of Indigenous Australian peoples.
Kelly et al 2009	Australia	Cross-sectional population-representative survey - 2004-05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS)	<ul style="list-style-type: none"> • The 2004-05 NATSIHS asked Aboriginal and Torres Strait Islander Australians who lived in non-remote areas questions about cultural identification. • 60% of Aboriginal and Torres Strait Islander Australians who lived in urban, inner, and outer regional areas identified with a language group and knew where their traditional country was.

Author and Year	Location	Study design	Findings
			<ul style="list-style-type: none"> • There was no identifiable relationship between the level of psychological distress and cultural identity assessed by knowledge of language group, clan, and traditional country. • However, the authors cautioned that the responses to these questions may have been confounded by the unwillingness of Aboriginal and Torres Strait Islander respondents to discuss culturally significant information with non-Aboriginal and Torres Strait Islander survey interviewers.
Burgess et al 2009	Arnhem land Northern Territory	Cross-sectional study of 298 Aboriginal and Torres Strait Islander adults in remote communities	<ul style="list-style-type: none"> • Caring for country was defined as engaging in activities including time on country, burning of annual grasses, gathering of food and medicinal supplies, ceremony, protecting sacred places, and producing artwork. • Aboriginal and Torres Strait Islander adults engaged with caring for country were significantly more likely to have: a better diet, be more physically active; lower body mass index ($\beta=-2.8$; 95% CI: -4.6 to -1.1), lower abdominal obesity (OR=0.4; 0.3-0.7), lower prevalence of diabetes (OR=0.1; 0.03-0.5); lower HbA_{1c} level ($\beta=-0.5$; -0.8 to -0.1), higher HDL cholesterol ($\beta=0.1$; 0.01-0.12); lower level of psychological distress ($\beta=-0.97$; -1.6 to -0.3); and lower risk of cardiovascular disease ($\beta=-0.8$; -1.4 to -0.1).
Dockery 2010	Australia	Cross-sectional population-representative survey - 2002 National Aboriginal and Torres Strait Islander Social Survey (NATSISS).	<ul style="list-style-type: none"> • A factor analysis to identify the variables captured in the 2002 NATSISS that best summarise connection to culture identified: involvement in the social activities of funerals, ceremonies or festivals; fishing or hunting in a group; speaking an Aboriginal and Torres Strait Islander language; and attending a cultural event or ceremony. • Multivariable regression modelling showed a 'U' shaped relationship between connection to culture and self-assessed health status, where Aboriginal and Torres Strait Islander Australians with strong connection to culture and those with little or none reported significantly better self-assessed health than those with moderate or weak connection to culture. • Aboriginal and Torres Strait Islander Australians with moderate or weak connection to culture were also more likely to have been arrested in the past five years and to engage in risky consumption of alcohol. • In contrast, Aboriginal and Torres Strait Islander Australians with a strong connection to culture were least likely to engage in risky consumption of alcohol.

Author and Year	Location	Study design	Findings
			<ul style="list-style-type: none"> • Having a strong connection to culture was also associated with better socioeconomic outcomes—those with a strong connection to culture were more likely to be employed and to have a higher level of educational attainment than those with minimal connection to culture. • The authors hypothesised that the poorer health outcomes of Aboriginal and Torres Strait Islander Australians with moderate or weak connection to culture may be “...indicative of the isolation, confusion and the feelings of loss of control and self-esteem that often beset people trying to live between two cultures” and cites the literature that may support this hypothesis.
Dockery 2011	Australia	Cross-sectional population-representative survey - 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS).	<ul style="list-style-type: none"> • Additional questions were included in the 2008 NATSISS including direct measures of subjective wellbeing and additional measures of connection to culture. • The results confirm the findings of his previous study (Dockery 2010). • Multivariable regression modelling showed that strong connection to culture was associated with greater subjective wellbeing for those who lived in remote areas. • However strong connection to culture was associated with higher levels of psychological distress and experiences of racism in those who lived in non-remote areas.

Overall, it appears that connection to culture is associated with better health among Aboriginal and Torres Strait Islander peoples living on their remote homelands despite their higher level of poverty. In contrast, the findings for Aboriginal and Torres Strait Islander peoples living in non-remote areas is inconsistent.

The findings appear to contradict our current understanding of the social determinants of health in relation to poverty and socioeconomic status. The very high level of poverty in remote communities is well documented and yet Aboriginal and Torres Strait Islander peoples who live in these communities appear to have better health than Aboriginal and Torres Strait Islander peoples who live in rural or urban communities with less poverty. One possible explanation put forward by Dockery (2011) was that the health benefits of being connected to culture for Aboriginal and Torres Strait Islander peoples who live in non-remote areas may be offset by the psychological distress evoked by experiences of racism (Dockery 2011).

In closing, while there is a lack of research on the relationship between connection to culture and country and health, particularly in Victoria, what exists suggests positive and consistent benefits to health where connection to culture and country are strong. While ‘culture’ and ‘country’ are two related but different concepts, Tom Calma, a former Aboriginal and Torres Strait Islander Social Justice Commissioner explained the relationship: “Culture is the key to caring for country and caring for country is the key to the maintenance and strengthening of our culture and wellbeing” (Burgess et al. 2008).

However, it is important to note that Aboriginal and Torres Strait Islander peoples are a diverse group of cultures who occupy a diverse range of environments and therefore it is unclear if these findings can be extrapolated to the Aboriginal and Torres Strait Islander cultures of Victoria.

Since all the data reported in Table 1.7 were cross-sectional, it is not possible to make any assertions about causality or its direction(s). Moreover, the paucity of studies investigating connection to culture and health in non-remote areas, and the lack of an agreed definition of what constitutes connection to culture as well as how to measure it, warrants caution in interpreting the results of the few studies that do exist.

However, the recent longitudinal and experimental studies described in the update to the literature review offer compelling evidence in favour of a strong health-promoting benefit of connection to culture. These studies may be heralding in many more studies, as the recognition of the cultural determinants of Aboriginal and Torres Strait Islander health gain currency.

[Update of literature from 2014-2019:](#) Four additional studies were identified. The first study was an evaluation of a new hospital-based mental healthcare program for Aboriginal and Torres Strait Islander adolescents in Victoria, which was developed in response to poor

treatment outcomes of the ongoing treatment program for children and adolescents (Vance et al. 2017).

The program was developed with extensive consultation with the Koori community and coupled Aboriginal and Torres Strait Islander dialogue and culture with Western biopsychosocial treatments (medication and cognitive behavioural therapy), and included parent and teacher management and training. It involved the Aboriginal and Torres Strait Islander patient choosing a culturally safe place in the hospital where the assessments and treatments were conducted by a non-Aboriginal and Torres Strait Islander clinician with a Koori Mental Health Worker or a clinician of Aboriginal and Torres Strait Islander heritage, who would share the importance of their Aboriginal and Torres Strait Islander heritage with the patient and encourage the patient to reciprocate. The style of questioning was inclusive, open, included silences and careful listening in contrast to the more unidirectional and prescriptive Western style.

The outcome was judged to be successful if at least two of the three informants reported a 50% reduction or more in the frequency and severity of the patient's symptoms. Of 1,000 cases treated over five years, 72% that were previously deemed to be treatment non-responsive had a successful outcome, compared with only 31% prior to trialling of the new program. The authors also observed that the patients were more engaged and compliant with the Western biopsychosocial treatments which resulted in the use of lower doses of medications, fewer cognitive behavioural therapy sessions and reduced time on medication. Moreover, many of the patients retained an interest in exploring their cultural heritage with Elders and other members of their communities (Vance et al. 2017).

The second study was a qualitative study conducted in Victoria—a state that does not have any remote Aboriginal and Torres Strait Islander communities. The study interviewed 69 Aboriginal and Torres Strait Islander adults who attended one of 11 'gathering places' across Victoria (Kingsley et al. 2018). A 'gathering place' is a community hub that promotes the importance of Aboriginal and Torres Strait Islander culture in improving and sustaining Aboriginal and Torres Strait Islander health and wellbeing. Therefore, attendance at a gathering place is likely to reflect connection to culture. This is the first study to investigate the health promoting effects of gathering places in Victoria.

Thematic analysis revealed that gathering places promote health and wellbeing by providing a culturally safe space, free of discrimination where Aboriginal and Torres Strait Islander Victorians can learn about and practice cultural knowledge. They were seen to be inclusive spaces that created a sense of belonging that counteracts social isolation, builds resilience, and builds connection to culture and country. They were also seen as particularly important for members of the Stolen Generations, enabling them to reconnect with their communities and cultures. Moreover, the study noted that gathering places allowed Aboriginal and Torres

Strait Islander Victorians to engage with non-Aboriginal and Torres Strait Islander Victorians on their own terms to build cultural competence and understanding (Kingsley et al. 2018).

The third study was a longitudinal study that investigated the social and emotional health and wellbeing of Aboriginal and Torres Strait Islander children in relation to their degree of ethnic-racial identity (Macedo et al. 2019).

408 children aged 9 to 12 years from the K-cohort of the Longitudinal Study of Indigenous Children were evaluated for their ethnic-racial identity, experiences of racism and social and emotional health over two years. The children's caregivers were asked whether their child had been bullied or treated unfairly at school because of their Aboriginal and Torres Strait Islander status and asked to complete the Strengths and Difficulties Questionnaire to assess the child's social and emotional health. The child was asked a set of four questions that centred around how good they felt about being Aboriginal and Torres Strait Islander.

The study employed generalised linear models with a log-Poisson link and robust errors and used an effect-measure modification analysis, while controlling for the potential confounding effects of age, sex, socioeconomic status, level of residential geographic remoteness.

Compared with children who had a strong ethnic-racial identity, children who had a low ethnic-racial identity were at increased risk of hyperactive behaviour (Risk Ratio (RR)=2.53; 95% CI: 1.17-5.48), conduct problems (RR= 2.35; 1.07-5.15), and total difficulties (RR=1.73; 0.84-3.55). In contrast, children with a strong ethnic-racial identity were at increased risk of peer problems (RR=1.66; 0.78-3.52).

The authors concluded that having a strong Aboriginal and Torres Strait Islander identity, which would reflect a strong connection to culture, mitigated the health-damaging effects of racism. However, the finding that Aboriginal and Torres Strait Islander children with a strong Aboriginal and Torres Strait Islander identity were at increased risk of peer problems may reflect being targeted by their peers because of their strong Aboriginal and Torres Strait Islander identity and/or these children may be more likely to confront racist behaviour by their peers (Macedo et al. 2019). These findings are consistent with the international literature.

Lastly, a similar study sought to determine if cultural identity buffered the association between experiences of racism and psychological distress in Aboriginal and Torres Strait Islander adults who were incarcerated in Victoria (Shepherd et al. 2018). Data was obtained from 78 individuals in custody who were participants in the Koori Prisoner Mental Health and Cognitive Function Study—a study conducted to determine the mental health needs of Victorian prisoners who identified as Aboriginal or Torres Strait Islander.

Cultural identity was determined using a newly constructed 7-item questionnaire and psychological distress measured using the Kessler 5 Psychological Distress Scale. Overall, levels of psychological distress increased with increasing experiences of racism, irrespective

of degree of cultural identity. However, prisoners with a strong cultural identity had lower levels of distress and higher levels of personal agency compared with prisoners who had a weak cultural identity. Therefore, the findings support the contention that a strong cultural identity may help to buffer the negative health impacts of exposure to racism (Shepherd et al. 2018).

1.5.4 Discussion and conclusions of literature review

Once the social determinants of Aboriginal and Torres Strait Islander health are identified, it remains to be explained how the social determinants affect health. There are three main competing theories: the material, psychosocial and neo-material theories (Ansari et al. 2003). These three theories arose from studies that sought to explain the socioeconomic gradient in health but are relevant to all the social determinants of health.

The material theory

The material theory is that it is the absolute social position of an individual within a society that determines their health status. The further down the socioeconomic ladder a person is, the more likely they are to: live and work in unhealthy physical environments that have higher levels of toxins and pathogens; do more dangerous jobs; have less health-promoting resources such as recreational facilities, healthcare and healthy foods; and to live in areas that are overcrowded, violent and crime ridden (Adler and Snibbe 2003).

There is much empirical evidence to support the material theory. For example, the material theory may explain differences in the health status of peoples who live in high-income compared with low-income countries, as it is well documented that the life expectancy of peoples who live in low-income countries improves with economic growth (Wilkinson and Pickett 2009). However, as countries grow wealthier, the relationship between economic growth and health slows down and then plateaus (Wilkinson and Pickett 2009).

Therefore, economic growth in high-income countries, such as Australia, no longer brings significant improvements in the health of its population. In fact, high-income countries are experiencing long-term increases in the rates of anxiety and depression, obesity-related chronic diseases, and a range of problems such as violence and drug and alcohol addiction (Wilkinson and Pickett, 2009).

The explanation for this, according to Wilkinson and Pickett, lies in the *relative* distribution of income within societies. Income inequality, which is the unequal distribution of household or individual income across a population, explains much of the variation between high-income countries (Wilkinson 1997) (Wilkinson and Pickett 2009). This gave rise to the psychosocial explanation of socioeconomic gradients in health.

The psychosocial theory

The psychosocial theory posits that it is not the absolute position that a person occupies within a society, but the relative position and how that relative position is perceived (Wilkinson and Pickett 2009). The further down the socioeconomic ladder a person is, the

more likely they are to experience negative emotions such as hostility, shame, distrust, and psychological distress due to their perception of their relative position in society.

When an individual experiences stress, the hypothalamic–pituitary–adrenal (HPA) and the sympathetic-adrenal-medullary (SAM) axes are activated in what is referred to as the ‘fight-or-flight response’ (Kiecolt-Glaser et al. 2002). This causes the adrenal cortex of the adrenal gland to secrete cortisol and the adrenal medulla to secrete adrenaline in order to prepare the body for extreme physical exertion to confront or avoid the threat / stressor. Once the threat is over, the body returns to normal.

While this is an important short-term physiological response to ensure survival, chronic stimulation of the HPA and SAM axes are associated with long-term pathological changes that include dysregulation of HPA and SAM axes leading to hormonal imbalances (e.g. hypercortisolism), immunosuppression (both cellular and humoral), and increased allostatic load (Russ, Stamatakis et al. 2012) (Segerstrom and Miller 2004) (McEwen 2004). In turn, this results in diseases such as metabolic syndrome, type 2 diabetes, increased susceptibility to addictions and mental health problems, and so forth (Golden 2007) (Burke et al 2005).

Evidence for the psychosocial theory comes from Marmot’s seminal Whitehall civil servant studies that investigated socioeconomic gradients in health. Initially, Marmot et al (1984) assumed that the socioeconomic gradient in health that was observed among British civil servants would be explained by a similar gradient in behavioural risk factors. However, after controlling for differences in smoking, obesity, physical activity, high blood pressure and baseline illness, civil servants with the lowest occupational status were still twice more likely to die than those with the highest occupational status (Marmot et al. 1984). Therefore, behavioural risk factors only offered a very modest explanation.

There are several other studies of note that confirm Marmot’s findings. For example, an American study of longitudinal design investigated the physical functioning and self-rated health of 3,617 adults representative of the American non-institutionalised population over an 8-year period by socioeconomic status, measured by income and education (Lantz et al. 2001). After adjusting for baseline health status, adults in the lowest income group compared with adults in the highest income group had an increased odds of moderate to severe functional impairment of 2.1 (95% CI: 1.4-3.2), which only reduced to 1.9 (1.2-2.9) after adjusting for age, sex, race, smoking, alcohol consumption, body mass index and physical activity. The authors similarly concluded that behavioural risk factors were not the dominant mediating mechanism of socioeconomic disparities in health.

Subsequently, the socioeconomic gradient among British civil servants was shown to associated with psychosocial risk factors such as low self-esteem, status differences, lack of control over work and environment, low social capital and so forth, all of which declined with declining occupational status. For example, lack of control over one’s work explained 64% and 51% of the excess risk of cardiovascular disease in men and women, respectively, who were

in the lowest compared with the highest occupational grade of the British civil service (Matthews et al. 2010).

The material theory could not account for the findings of Marmot's Whitehall studies because these studies were conducted in a cohort of people who were not disadvantaged and had secure jobs in a hazard free environment, and yet a socioeconomic gradient in health still existed.

However, the psychosocial theory is not without its critics and this gave rise to the neo-materialist theory (Lynch et al. 2000).

The neo-materialist theory

The neo-materialist theory holds that while the psychosocial theory is valid, it is what lies behind socioeconomic inequality that is responsible for socioeconomic gradients in health. That is, that socioeconomic differences are due to the differential accumulation of exposures, experiences and resources, and significant under-investment in health-promoting community infra-structure, that are a consequence of the structural aspects of a society—the historical, cultural, economic, and socio-political processes (Lynch et al. 2000). Indeed, there is a wealth of scientific literature to support the psychosocial theory, which is beyond the scope of this literature review, however, it is the utility of the theory that is challenged.

Lynch et al (2000) argues that the psychosocial theory conflates the structural aspects of a society that generate inequality with the impact of those structural aspects. Moreover, by focussing on the psychological responses of those lower down the socioeconomic gradient, invites a policy response of victim blaming and attempts to build up the resilience of those affected by altering their perception, rather than addressing the underlying cause(s) (Lynch et al. 2000).

In contrast, the policy responses invited by the neo-materialist theory include better investment in health-promoting community infrastructure such as health, education, housing and so forth, while simultaneously implementing a more equitable distribution of public and private resources (Lynch et al. 2000).

In short, it is not that the psychosocial and neo-materialist theories are mutually exclusive and incompatible, it is that the psychosocial theory does not consider the cause(s) of the inequalities that causes those lower down the socioeconomic gradient to perceive their situation and react accordingly (Lynch 2000).

Lynch (2000) goes on to question whether in countries like Australia where the Aboriginal and Torres Strait Islander population has a significantly lower life expectancy than the non-Aboriginal and Torres Strait Islander population, it is helpful to attribute the lower life expectancy of Aboriginal and Torres Strait Islander peoples to their perception of their disadvantage rather than the structural and social causes of that disadvantage (Lynch 2000).

Conclusions

The literature review identifies and summarises publications from 1999 to 2013 on the social determinants of Aboriginal and Torres Strait Islander health and wellbeing, updated to 2019 with key papers based on a follow-up literature search.

Most of the literature was based on national data collections or states and territories other than Victoria. Given the paucity of studies conducted in Victoria, it is unclear how these pertain to Aboriginal and Torres Strait Islander peoples living in the state of Victoria.

Since most of the studies were of a cross-sectional or qualitative design, and almost one-third of the publications came from the non-peer-reviewed grey literature, the work to date appears to have achieved little more other than to have identified associations of various exposures with health outcomes. The potential causal pathways of confirmed associations remain to be elucidated with more appropriate study designs such as longitudinal studies, of which currently there are very few.

It is hoped that the work that follows on from here will contribute to understanding the causes of the gap in health between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians, in order to inform the development of better policy directions and interventions.

1.6 Note on nomenclature used in thesis

For reasons of necessity, as all peer-reviewed publications are subject to strict word limits, but not to take away from or to disrespect the many distinct ethnic identities, the publications arising from this thesis variously used the terms 'Aboriginal' or 'Indigenous' to refer to both Aboriginal and Torres Strait Islander peoples. The terms 'Aboriginal' or 'Indigenous' were used in preference to 'Koorie' as not all Aboriginal / Indigenous peoples who live in Victoria are Koori.

I recognise that, except for the term 'Koorie', all other terms are Eurocentric having been imposed upon peoples of many nations with distinct languages and cultures. The use of such terms, whether 'Aboriginal' or 'Indigenous', is akin to referring to the peoples of the continent of Europe as 'Europeans'.

1.7 References

Adler, N. E. and A. C. Snibbe (2003). "The role of psychosocial processes in explaining the gradient between socioeconomic status and health." Current Directions in Psychological Science **12**(4): 119-23.

Alvaro, S., L.A. Jackson, S. Kirk, T.L. McHugh, J. Hughes, A. Chircop and R.F. Lyons (2010). "Moving Canadian governmental policies beyond a focus on individual lifestyle; some insights from complexity and critical theories." Health Promotion International **26**(1): 91-9.

Andersen, M. J., A. Skinner, A. B. Williamson, P. Fernando and D. Wright (2018). "Housing conditions associated with recurrent gastrointestinal infection in urban Aboriginal children in NSW, Australia: findings from SEARCH." Australian and New Zealand Journal of Public Health **42**(3): 247-253.

Anderson, I., F. Baum and M. Bentley, Eds. (2007). Beyond bandaids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. Cooperative Research Centre for Aboriginal Health (CRCATH). Darwin.

Ansari, Z., N. J. Carson, M. J. Ackland, L. Vaughan and A. Serraglio (2003). "A public health model of the social determinants of health." Sozial- und Praventivmedizin **48**(4): 242-51.

Augoustinos, M., K. Tuffin and M. Rapley (1999). "Genocide or a failure to gel? Racism, history and nationalism in Australian talk." Discourse and Society **10**(3): 351-78.

Australian Bureau of Statistics (2004). "4714.0 - National Aboriginal and Torres Strait Islander Social Survey, 2002." Retrieved 01-November-2019, from <https://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/2575DCC732E7EE9C CA25765E001589D4>

Australian Bureau of Statistics (2010). "4704.0 - The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples, Oct 2010." Retrieved 02-October-2019, from <https://www.abs.gov.au/ausstats/abs@.nsf/mf/4704.0>

Australian Bureau of Statistics. (2013). "4727.0.55.001 - Australian Aboriginal and Torres Strait Islander Health Survey: First Results, Australia, 2012–13". Retrieved 10-November-2019, from <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4727.0.55.0012012-13?OpenDocument>.

Australian Bureau of Statistics. (2016a). "3238.0.55.001 - Estimates of Aboriginal and Torres Strait Islander Australians, June 2016." Retrieved 10-November-2019, from <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3238.0.55.001>.

Australian Bureau of Statistics (2016b). "2075.0 Census of Population and Housing - Counts of Aboriginal and Torres Strait Islander Australians, 2016." Retrieved 14-November-2019, from <https://www.abs.gov.au/statistics/people/aboriginal-and-torres-strait-islander-peoples/census-population-and-housing-counts-aboriginal-and-torres-strait-islander-australians/latest-release>

Australian Bureau of Statistics. (2016c). "4714.0 - National Aboriginal and Torres Strait Islander Social Survey, 2014-15." Retrieved 10-November-2019, from <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4714.02014-15?OpenDocument>

Australian Institute of Aboriginal and Torres Strait Islander Studies. (2019). Retrieved 13-November-2019, from <https://aiatsis.gov.au/>.

Australian Institute of Health and Welfare (2011). "The health and welfare of Australia's Aboriginal and Torres Strait Islander people, an overview 2011." Cat. no. IHW 42. AIHW. Canberra.

Australian Institute of Health and Welfare (2013). "Rheumatic heart disease and acute rheumatic fever in Australia: 1996–2012." Cardiovascular disease series. Cat. no. CVD 60. AIHW. Canberra.

Australian Institute of Health and Welfare (2014). "Australia's health 2014." Australia's health series no. 14. Cat. no. AUS 178. AIHW. Canberra.

Australian Institute of Health and Welfare 2016. "Australian Burden of Disease Study: Impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011." Australian Burden of Disease Study series no. 6. Cat. no. BOD 7. AIHW. Canberra.

Australian Institute of Health and Welfare. (2018). "Aboriginal and Torres Strait Islander Stolen Generations and descendants: numbers, demographic characteristics and selected outcomes." Cat. no: IHW 195. Retrieved 10-November-2019, from <https://www.aihw.gov.au/reports/life-expectancy-death/deaths/contents/life-expectancy>.

Australian Institute of Health and Welfare (2019a). "Deaths in Australia." Cat. no: PHE 229. Retrieved 23-November-2019, from <https://www.aihw.gov.au/reports/phe/229/deaths/deaths-in-australia/contents/life-expectancy>.

Australian Institute of Health and Welfare (2019b). "Children living in households with members of the Stolen Generations." Cat. no: IHW 214. Retrieved 25-November-2019, from <https://www.aihw.gov.au/reports/indigenous-australians/children-living-in-households-with-members-of-the/contents/summary>.

Axelsson, P., T. Kukutai and R. Kippen (2016). "The field of Indigenous health and the role of colonisation and history." Journal of Population Research **33**: 1-7.

Bailie, R. (2007). "Housing." Social determinants of health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest, NSW, Allen and Unwin: 203-230.

Bailie, R. S. and M. J. Runcie (2001). "Household infrastructure in Aboriginal communities and the implications for health improvement." Medical Journal of Australia **175**(7): 363-366.

Baum, F. (2007). "Social capital." Social determinants of health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest, NSW, Allen and Unwin: 109-134.

Baum, F. (2011). "From Norm to Eric: avoiding lifestyle drift in Australian health policy." Australian and New Zealand Journal of Public Health **35**(5): 404-6.

Baum, F., M. Bentley and I. Anderson (2007). "Introduction." Beyond bandaids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of

Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Darwin, Cooperative Research Centre for Aboriginal Health (CRCATH): ix-xv1. Darwin.

Baum, F. and M. Fisher (2011). "Are the national preventive health initiatives likely to reduce health inequities?" Australian Journal of Primary Health **17**(4): 320-6.

Bell, S., B. Boughton and B. Bartlett (2007). "Education as a determinant of health." Social determinants of health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest, NSW, Allen and Unwin: 37-55.

Berger, M., A. Leicht, A. Slatcher, A. K. Kraeuter, S. Ketheesan, S. Larkins and Z. Sarnyai (2017). "Cortisol Awakening Response and Acute Stress Reactivity in First Nations People." Scientific Reports **7**: 41760.

Berry, H. (2009). "Social capital and mental health among Aboriginal Australians, new Australians and other Australians living in a coastal region." Australian e-Journal for the Advancement of Mental Health **8**(2): 1-13.

Biddle, N. (2012). "Measures of indigenous social capital and their relationship with well-being." Australian Journal of Rural Health **20**(6): 298-304.

Bielefield, S. (2014/2015). "Compulsory income management, Indigenous peoples and structural violence - implications for citizenship and autonomy." Australian Indigenous Law Review **18**(1): 99-118.

Booth, A. L. and N. Carroll (2008). "Economic status and the Indigenous/non-Indigenous health gap." Economic Letters **99**: 604-6.

Boughton, B. (2000). "What is the connection between Aboriginal education and Aboriginal health?" Occasional Paper series. Darwin, Cooperative Research Centre for Aboriginal and Tropical Health (CRCATH).

Braveman, P., S. Egerter and D. R. Williams (2011). "The social determinants of health: coming of age." Annual Review of Public Health **32**: 381-98.

Broadbent, A. (2009). "Causation and models of disease in epidemiology." Studies in History and Philosophy of Biological and Biomedical Sciences **40**(4): 302-11.

Broome, R. (2005). Aboriginal Victorians: A history since 1800. Crows Nest NSW, Allen & Unwin.

Brough, M., C. Bond, J. Hunt, D. Jenkins, C. Shannon and L. Schubert (2006). "Social capital meets identity. Aboriginality in an urban setting." Journal of Sociology **42**(4): 396-411.

Brough, M., G. Henderson, R. Foster and H. Douglas (2007). "Social capital and Aboriginal and Torres Strait Islander health; problems and possibilities." Beyond band-aids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of

Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Darwin, Cooperative Research Centre for Aboriginal Health (CRCATH): 191-207. Darwin.

Brown, R. C. H. (2013). "Moral responsibility for (un)healthy behaviour." Journal of Medical Ethics **39**: 695-8.

Browne-Yung, K., A. Ziersch, F. Baum and G. Gallaheer (2013). "Aboriginal Australians' experience of social capital and its relevance to health and wellbeing in urban settings." Social Science and Medicine **97**: 20-28.

Burgess, P. and J. Morrison (2007). "Country." Social determinants of health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest, NSW, Allen and Unwin: 177-202.

Burgess, C. P., F. H. Johnston, H. L. Berry, J. McDonnell, D. Yibarbuk, C. Gunabarra, A. Mileran and R. S. Bailie (2009). "Healthy country, healthy people: the relationship between Indigenous health status and "caring for country"." Medical Journal of Australia **190**(10): 567-72.

Burke, H. M., M. C. Davis, C. Otte and D. C. Mohr (2005). "Depression and cortisol responses to psychological stress: a meta-analysis." Psychoneuroendocrinology **30**(9): 846-56.

Butler, S., M. Williams, C. Tukuitonga and J. Paterson (2003). "Problems with damp and cold housing among Pacific families in New Zealand." New Zealand Medical Journal **116**(1177): U494.

Carson, B., T. Dunbar, R. D. Chenhall and R. Bailie, Eds. (2007). Social determinants of Indigenous health. Crows Nest NSW, Allen and Unwin.

Cave, L., M.N. Cooper, Zubrick, S.R and C. Shepherd (2019), "Caregiver-perceived racial discrimination is associated with diverse mental health outcomes in Aboriginal and Torres Strait Islander children aged 7-12 years." International Journal for Equity in Health **18**: 142-52.

Commonwealth of Australia (2019). Closing the gap: Prime Minister's report 2019. Canberra, Department of the Prime Minister and Cabinet.

Crawford, H. and N. Biddle (2017). "Changing associations of selected social determinants with Aboriginal and Torres Strait Islander health and wellbeing, 2002 to 2012-13." CAEPR Working Paper no. 113/2017. Centre for Aboriginal Economic Policy Research (CAEPR). Canberra, The Australian National University.

Cunningham, J., K. O'Dea, T. Dunbar, T. Weeramanthri, J. Shaw and P. Zimmet (2008). "Socioeconomic status and diabetes among urban Indigenous Australians aged 15-64 years in the DRUID study." Ethnicity and Health **13**(1): 23-37.

Cutler, D., F. Lange, E. Meara, S. Richards-Shubik and C. Ruhm (2011). "Rising educational gradients in mortality: the role of behavioral risk factors." Journal of Health Economics **30**: 1174-87.

Czyzewski, K. (2011). "Colonialism as a broader social determinant of health." The International Indigenous Policy Journal **2**(1): 1-14.

Dockery, A. M. (2010). "Culture and wellbeing: the case of Indigenous Australians." Social Indicators Research **99**: 315-32.

Dockery, A. M. (2011). Traditional culture and the wellbeing of Indigenous Australians: An analysis of the 2008 NATSISS. CLMR Discussion Paper Series 2011/01. Perth, Western Australia, Centre for Labour Market Research, Curtin University.

Dunbar, T. and M. Scrimgeour (2007). "Education." Social determinants of Indigenous health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest NSW, Allen and Unwin: 135-52.

Eades, S. J., B. Taylor, S. Bailey, A. B. Williamson, J. C. Craig, S. Redman and S. Investigators (2010). "The health of urban Aboriginal people: insufficient data to close the gap." Medical Journal of Australia **193**(9): 521-4.

Ebrahim, S., F. Taylor, K. Ward, A. Beswick, M. Burke and G. Davey Smith (2011). "Multiple risk factor interventions for primary prevention of coronary heart disease." Cochrane Database Syst Rev (1): CD001561.

Ehsan, A. M. and M. J. De Silva (2015). "Social capital and common mental disorder: a systematic review." Journal of Epidemiology and Community Health **69**(10): 1021-8.

Ewald, D. and B. Boughton (2002). "Maternal education and child health: an exploratory investigation in a central Australian community." Occasional Paper series. Darwin, Cooperative Research Centre for Aboriginal and Tropical Health (CRCATH). Issue 7.

Ferdinand, A., Y. Paradies and M. Kelaher (2012). "Mental health impacts of racial discrimination in Victorian Aboriginal Communities: The Localities Embracing and Accepting Diversity (LEAD) experiences of racism survey." Melbourne, The Lowitja Institute.

Golden, S. H. (2007). "A review of the evidence for a neuroendocrine link between stress, depression and diabetes mellitus." Current Diabetes Reviews **3**(4): 252-9.

Gracey, M. and M. King (2009). "Indigenous health part 1: determinants and disease patterns." Lancet **374**(9683): 65-75.

Gray, S. (2007). "The elephant in the drawing room: slavery and the 'stolen wages' debate." Australian Indigenous Law Review **11**(1): 30-53.

Gray, A. and B. Boughton (2001). "Education and health behaviour of Indigenous Australians: evidence from the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS)." Occasional Paper series. Darwin, Cooperative Research Centre for Aboriginal and Tropical Health (CRCATH). Issue 3.

Harris, J. (2003). "Hiding the bodies: the myth of the human colonisation of Aboriginal Australia." *Aboriginal History* **27**: 79-104.

Hill, K., B. Barker and T. Vos (2007). "Excess Indigenous mortality: are Indigenous Australians more severely disadvantaged than other Indigenous populations?" *International Journal of Epidemiology* **36**(3): 580-9.

Hirschberger, G. (2018). "Collective trauma and the social construction of meaning." *Frontiers in Psychology* **9**: 1411-1455.

Holt-Lunstad, J., T. B. Smith and J. B. Layton (2010). "Social relationships and mortality risk: a meta-analytic review." *PLoS Med* **7**(7): e1000316.

Horvath, R. J. (1972). "A definition of colonialism " *Current Anthropology* **13**(1): 45-57.

Hunter, B. (1999). "Three nations, not one: indigenous and other Australian poverty." *CAEPR Working Paper no. 1/1999*. Centre for Aboriginal Economic Policy Research (CAEPR). Canberra, The Australian National University.

Hunter, B. H. (2000). "Social exclusion, social capital, and Indigenous Australians: measuring the social costs of unemployment." *CAEPR Discussion Paper no. 204/2000*. Centre for Aboriginal Economic Policy Research (CAEPR). Canberra, Australian National University.

Hunter, B. and A. Hawke (2000a). "A comparative analysis of the industrial relations experiences of Indigenous and other Australian workers." *CAEPR Discussion Paper no. 201*. Centre for Aboriginal Economic Policy Research (CAEPR). Canberra, The Australian National University.

Hunter, B. and A. Hawke (2000b). "Industrial relations in workplaces employing Indigenous Australians." *CAEPR Discussion Paper no. 200*. Centre for Aboriginal Economic Policy Research (CAEPR). Canberra, The Australian National University.

Hunter, B., S. Kennedy and D. Smith (2003). "Household composition, equivalence scales and the reliability of income distributions: some evidence for Indigenous and other Australians." *The Economic Record* **79**(244): 70-83.

Hunter, E. (2002). ""Best intentions" lives on: untoward health outcomes of some contemporary initiatives in Indigenous affairs." *Australian and New Zealand Journal of Psychiatry* **36**(5): 575-84.

Johnson, S. (2013). "Increasing psychology's role in health research and health care." *American Psychologist* **68**(5): 311-321.

Ikeda, A. and I. Kawachi (2010). "Social networks and health." *Handbook of behavioral medicine*. A. Steptoe. Berlin, Germany, Springer: 237-61.

Jung, J., S. Rahman, H. Rashid and G. Khandaker (2014). "Current status of trachoma elimination in Australia: making trachoma a history by 2020." Infectious Disorders - Drug Targets **14**(3): 219-22.

Kawachi, I. and L. F. Berkman (2014). "Social capital, social cohesion, and health." Social epidemiology. L. F. Berkman, I. Kawachi and M. M. Glymour. New York, NY, Oxford University press.

Kelly, K., P. Dudgeon, G. Gee and B. Glaskin (2009). "Living on the edge: social and emotional wellbeing and risk and protective factors for serious psychological distress among Aboriginal and Torres Strait Islander people." Discussion paper No. 10. Darwin, Cooperative Research Centre for Aboriginal Health.

Kiecolt-Glaser, J. K., L. McGuire, T. F. Robles and R. Glaser (2002). "Emotions, morbidity, and mortality: new perspectives from psychoneuroimmunology." Annual Review of Psychology **53**: 83-107.

King, M., A. Smith and M. Gracey (2009). "Indigenous health part 2: the underlying causes of the health gap." Lancet **374**(9683): 76-85.

Kingsley, J., M. Townsend, R. Phillips, and D. Aldous (2009). "“if the land is healthy ... it makes the people healthy”: The relationship between caring for Country and health for the Yorta Yorta nation, Boonwurrung and Bangerang tribes." Health and Place **15**: 291-99.

Kingsley, J., E. Munro-Harrison, A. Jenkins and A. Thorpe (2018). "Here we are part of a living culture": Understanding the cultural determinants of health in Aboriginal gathering places in Victoria, Australia." Health and Place **54**: 210-20.

Krieg, A. (2009). "The experience of collective trauma in Australian Indigenous communities." Australasian Psychiatry **17 Suppl 1**: S28-32.

Lantz, P. M., J. W. Lynch, J. S. House, J. M. Lepkowski, R. P. Mero, M. A. Musick and D. R. Williams (2001). "Socioeconomic disparities in health change in a longitudinal study of US adults: the role of health-risk behaviors." Social Science and Medicine **53**(1): 29-40.

Larson, A. (1994). Growing up in Melbourne: family life in the late nineteenth century. Canberra, Australian National University.

Larson, A., M. Giles, P. J. Howard and J. Coffin (2007). "It's enough to make you sick: the impact of racism on the health of Aboriginal Australians." Australia and New Zealand Journal of Public Health **31**: 322-29.

Lindstrom, M. (2008). "Social capital and health-related behaviors." Social capital and health. I. Kawachi, S. Subramanian and D. Kim. New York, NY, Springer.

Lowry, D. and M. Moskos (2007). "Labour force participation as a determinant of Indigenous health." Beyond band-aids: exploring the underlying social determinants of Aboriginal health.

Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Darwin, Cooperative Research Centre for Aboriginal Health (CRCATH): 91-101. Darwin.

Lynch, J. (2000). "Income inequality and health: expanding the debate." Social Science and Medicine **51**(7): 1001-1005; discussion 1009-10.

Lynch, J. W., G. D. Smith, G. A. Kaplan and J. S. House (2000). "Income inequality and mortality: importance to health of individual income, psychosocial environment, or material conditions." British Medical Journal **320**(7243): 1200-4.

Macedo, D. M., L. G. Smithers, R. M. Roberts, D. G. Haag, Y. Paradies and L. M. Jamieson (2019). "Does ethnic-racial identity modify the effects of racism on the social and emotional wellbeing of Aboriginal Australian children?" PLoS One **14**(8): e0220744.

Macleod, J. and G. Davey Smith (2003). "Psychosocial factors and public health: a suitable case for treatment?" Journal of Epidemiology and Community Health **57**(8): 565-570.

Malin, M. (2003). "Is schooling good for Aboriginal children's health?" Occasional Paper series. Darwin, Cooperative Research Centre for Aboriginal and Tropical Health (CRCATH). Issue 8.

Malin, M. and D. Maidment (2003). "Education, Indigenous survival and well-being: emerging ideas and programs." The Australian Journal of Indigenous education **32**: 87-100.

Mallett, S., R. Bentley, E. Baker, K. Mason, D. Keys, V. Kolar and L. Krnjacki (2011). "Precarious housing and health inequalities: what are the links?" The Victorian Health Promotion Foundation (VicHealth), Melbourne.

Mansouri, F. and L. Jenkins (2010). "Schools as sites of race relations and intercultural tension." Australian Journal of Teacher Education **35**(7): 93-108.

Marmot, M. G., M. J. Shipley and G. Rose (1984). "Inequalities in death--specific explanations of a general pattern?" Lancet **1**(8384): 1003-6.

Martikainen, P., M. Bartley and E. Lahelma (2002). "Psychosocial determinants of health in social epidemiology." International Journal of Epidemiology **31**(6): 1091-1093.

Matthews, K. A., L. C. Gallo and S. E. Taylor (2010). "Are psychosocial factors mediators of socioeconomic status and health connections? A progress report and blueprint for the future." Annals of the New York Academy of Sciences **1186**: 146-73.

McCalman, J., R. Morley and G. Mishra (2008). "A health transition: birth weights, households and survival in an Australian working-class population sample born 1857-1900." Social Science and Medicine **66**(5): 1070-83.

McCalman, J., L. Smith, A. I., R. Morley and G. Mishra (2009). "Colonialism and the health transition: Aboriginal Australians and poor whites compared, Victoria, 1850-1985." The History of the Family **14**(3): 253-65.

McDermott, R., K. O'Dea, K. Rowley, S. Knight and P. Burgess (1999). "Beneficial impact of the homelands movement on health outcomes in central Australian aborigines." Australian and New Zealand Journal of Public Health **22**(6): 653-8.

McEwen, B. S. (2004). "Protection and damage from acute and chronic stress: allostasis and allostatic overload and relevance to the pathophysiology of psychiatric disorders." Annals of the New York Academy of Science **1032**: 1-7.

McPherson, K. E., S. Kerr, E. McGee, A. Morgan, F. M. Cheater, J. McLean and J. Egan (2014). "The association between social capital and mental health and behavioural problems in children and adolescents: an integrative systematic review." BMC Psychology **2**(1): 7.

Mignone, J. (2009). "Social capital and Aboriginal communities: a critical assessment synthesis and assessment of the body of knowledge on social capital with emphasis on Aboriginal communities." Journal of Aboriginal Health **5**(3): 100-147.

Mitchell, J. (2007). "History." Social determinants of Indigenous health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest NSW, Allen and Unwin: 41-64.

Morrissey, M., R. Pe-Pua, A. Brown and A. Latif (2007). "Culture as a determinant of Aboriginal health." Beyond band-aids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Darwin, Cooperative Research Centre for Aboriginal Health (CRCATH): 239-54. Darwin.

Moreton-Robinson, A. (2009). "Imagining the good indigenous citizen." Cultural Studies Review **15**(2): 61-79.

Mykletun, A., O. Bjerkeset, S. Overland, M. Prince, M. Dewey and R. Stewart (2009). "Levels of anxiety and depression as predictors of mortality: the HUNT study." The British Journal of Psychiatry **195**: 118-25.

National Aboriginal Health Strategy Working Party (1989). "A National Aboriginal Health Strategy—Report." Canberra.

National Health and Medical Research Council (2018). "Road Map 3: A strategic framework for improving Aboriginal and Torres Strait Islander health through research."

O'Donnell, M., S. Taplin, R. Marriott, F. Lima and F. J. Stanley (2019). "Infant removals: The need to address the over-representation of Aboriginal infants and community concerns of another 'stolen generation'." Child Abuse and Neglect **90**: 88-98.

Paradies, Y. (2006). "A systematic review of empirical research on self-reported racism and health." International Journal of Epidemiology **35**(4): 888-901.

Paradies, Y., R. Harris and I. Anderson (2008). The impact of racism on Indigenous health in Australia and Aotearoa: towards a research agenda. Discussion Paper No. 4. Darwin, Cooperative Research Centre for Aboriginal and Tropical Health (CRCATH).

Paradies, Y. C. and J. Cunningham (2012a). "The DRUID study: exploring mediating pathways between racism and depressive symptoms among indigenous Australians." Social Psychology and Psychiatric Epidemiology **47**(2): 165-73.

Paradies, Y. C. and J. Cunningham (2012b). "The DRUID study: racism and self-assessed health status in an indigenous population." BMC Public Health **12**: 131-43.

Paradies, Y., J. Ben, N. Denson, A. Elias, N. Priest, P. A., A. Gupta, M. Kelaher and G. Gee (2015). "Racism as a determinant of health: a systematic review and meta-analysis." PLoS one **10**(9): 1-48.

Pikhart, H. and J. Pikhartova (2015). "The Relationship Between Psychosocial Risk Factors and Health Outcomes of Chronic Diseases: A Review of the Evidence for Cancer and Cardiovascular Diseases." Health Evidence Network (HEN) synthesis report. WHO Regional Office for Europe. Copenhagen.

Priest, N., T. Mackean, E. Davis, E. Waters and L. Briggs (2012). "Strengths and challenges for Koori kids: harder for Koori kids, Koori kids doing well - exploring Aboriginal perspectives on social determinants of Aboriginal child health and wellbeing." Health Sociology Review **12**(2): 165-179.

Priest, N., Y. Paradies, P. Stewart and J. Luke (2011a). "Racism and health among urban Aboriginal young people." BMC Public Health **11**: 568-77.

Priest, N. C., Y. C. Paradies, W. Gunthorpe, S. J. Cairney and S. M. Sayers (2011b). "Racism as a determinant of social and emotional wellbeing for Aboriginal Australian youth." Medical Journal of Australia **194**(10): 546-50.

Priest, N., A. Kavanagh, L. Becares and T. King (2019). "Cumulative Effects of Bullying and Racial Discrimination on Adolescent Health in Australia." Journal of Health and Social Behavior **60**(3): 344-61.

Reilly, R. E., J. Doyle, D. Bretherton, K. G. Rowley, J. L. Harvey, P. Briggs, S. Charles, J. Calleja, R. Patten and V. Atkinson (2008). "Identifying psychosocial mediators of health amongst indigenous Australians for the Heart Health Project." Ethnicity and Health **13**(4): 351-373.

Ring, I. T. and N. Brown (2002). "Indigenous health: chronically inadequate responses to damning statistics." Medical Journal of Australia **177**(11-12): 629-31.

Robertus, L. M., A. Konstantinos, N. E. Hayman and D. L. Paterson (2011). "Tuberculosis in the Australian Indigenous population: history, current situation and future challenges." Australian and New Zealand Journal of Public Health **35**(1): 6-9.

Rowley, C. D. (1986). The destruction of Aboriginal society. Ringwood, Victoria, Penguin books.

Rowley, K. G., K. O'Dea, I. Anderson, R. McDermott, K. Saraswati, R. Tilmouth, I. Roberts, J. Fitz, Z. Wang, A. Jenkins, J. D. Best, Z. Wang and A. Brown (2008). "Lower than expected morbidity and mortality for an Australian Aboriginal population: 10-year follow-up in a decentralised community." Medical Journal of Australia **188**(5): 283-7.

Russ, T. C., E. Stamatakis, M. Hamer, J. M. Starr, M. Kivimaki and G. D. Batty (2012). "Association between psychological distress and mortality: individual participant pooled analysis of 10 prospective cohort studies." British Medical Journal **345**: e4933.

Segerstrom, S. C. and G. E. Miller (2004). "Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry." Psychological Bulletin **130**(4): 601-30.

Shaw, M. (2004). "Housing and public health." Annual Review of Public Health **25**: 397-418.

Shepherd, C., J. Li and S. R. Zubrick (2012a). "Socioeconomic disparities in physical health among Aboriginal and Torres Strait Islander children in Western Australia." Ethnicity & Health **17**(5): 439-61.

Shepherd, C., J. Li, F. Mitrou and S. R. Zubrick (2012b). "Socioeconomic disparities in the mental health of Indigenous children in Western Australia." BMC Public Health **12**: 756-68.

Shepherd, C., J. Li and S. R. Zubrick (2012c). "Social gradients in the health of Indigenous Australians." American Journal of Public Health **102**(1): 107-17.

Shepherd, C., J. Li, M.N. Cooper, K.D. Hopkins and B. M. Farrant (2017). "The impact of racial discrimination on the health of Australian Indigenous children aged 5-10 years: analysis of national longitudinal data." International Journal for Equity in Health **16**: 116-28.

Shepherd, S. M., R.H. Delgado and Y, Paradies (2018). "Inter-relationships among cultural identity, discrimination, distress, agency, and safety among Indigenous people in custody." International Journal of Forensic Mental Health **17**(2): 111-21.

Shy, C. M. (1997). "The failure of academic epidemiology: witness for the prosecution." American Journal of Epidemiology **145**(6): 479-84.

Social Health Reference Group (2004). "Social and emotional well being framework: a national strategic framework for Aboriginal and Torres Strait Islander mental health and social and emotional well being 2004-2009." Canberra, Australian Government.

Szreter, S. and M. Woolcock (2004). "Health by association? Social capital, social theory, and the political economy of public health." International Journal of Epidemiology **33**(4): 650-67.

Tarlov, A. R. (1999). "Public policy frameworks for improving population health." Annals of the New York Academy of Science **896**: 281-93.

Taylor, H. R. (2001). "Trachoma in Australia." Medical Journal of Australia **175**(7): 371-72.

The Healing Foundation (2017). "Bringing them home 20 years on: an action plan for healing." Canberra. The Healing Foundation.

Tilbury, C. and J. Thoburn (2009). "Using racial disproportionality and disparity indicators to measure child welfare outcomes." Children and Youth Services Review **31**(10): 1101-06.

Vance, A., J. McGaw, J. Winther, M. Rayner, S. White and A. Smith (2017). "Mental health care for Indigenous young people: moving culture from the margins to the centre." Australasian Psychiatry **25**(2): 157-60.

Veracini, L. (2013). "Settler colonialism': career of a concept." The Journal of Imperial and Commonwealth History **41**(2): 313-33.

Vickery, J., S. Faulkhead, K. Adams and A. Clarke (2007). "Indigenous insights into oral history, social determinants and decolonisation. " Beyond bandaids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Cooperative Research Centre for Aboriginal Health (CRCATH): 19-36. Darwin.

Victorian Aboriginal Corporation for Languages. (2019). Retrieved 23-November 2019, from <https://vacl.org.au/home>.

Vos, T., B. Barker, S. Begg, L. Stanley and A. D. Lopez (2009). "Burden of disease and injury in Aboriginal and Torres Strait Islander Peoples: the Indigenous health gap." International Journal of Epidemiology **38**(2): 470-77.

Wade, D. T. and P. W. Halligan (2004). "Do biomedical models of illness make for good healthcare systems?" British Medical Journal **329**(7479): 1398-1401.

Walter, M. (2007). "Aboriginality, poverty and health - exploring the connections." Beyond bandaids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Darwin, Cooperative Research Centre for Aboriginal Health (CRCATH): 77-90. Darwin.

Walter, M. and G. Mooney (2007). "Employment and welfare." Social determinants of health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest, NSW, Allen and Unwin: 153-175.

Walter, M. and S. Siggers (2007). "Poverty and social class." Social determinants of health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest, NSW, Allen and Unwin: 87-107.

Watts, C. and S. Cairncross (2012). "Should the GBD risk factor rankings be used to guide policy?" Lancet **380**(9859): 2060-61.

Welsh, J. A. and H. L. Berry (2009). Social capital and mental health and well-being. Biennial HILDA Survey Research Conference, The Australian National University, Melbourne Institute of Applied Economic and Social Research.

Wilkinson, R. G. (1997). "Socioeconomic determinants of health. Health inequalities: relative or absolute material standards?" British Medical Journal **314**(7080): 591-5.

Wilkinson, R. and K. Pickett (2009). The Spirit Level: Why More Equal Societies Almost Always Do Better. London, Allen Lane.

Woolcock, M. and D. Narayan (2000). "Social capital: implications for development theory, research, and policy." The World Bank Research Observer **15**(2): 225-49.

World Health Organization (2008). Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on the Social Determinants of Health Geneva, World Health Organization.

World Health Organization. (2019). "Trachoma." Retrieved 30-May-19, from <https://www.who.int/trachoma/en/>

Zhao, Y., J. Wright, S. Begg and S. Guthridge (2013). "Decomposing Indigenous life expectancy gap by risk factors: a life table analysis." Population Health Metrics **11**(1): 1-9.

Ziersch, A. M., G. Gallaher, F. Baum and M. Bentley (2011). "Responding to racism: insights on how racism can damage health from an urban study of Australian Aboriginal people." Social Science and Medicine **73**(7): 1045-53.

Zubrick, S. R., P. Dudgeon, G. Gee, B. Glaskin, K. Kelly, Y. Paradies, C. Scrine and R. Walker, Eds. (2010). Social determinants of Aboriginal and Torres Strait Islander social and emotional wellbeing. Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice. Canberra, ACT.

CHAPTER 2: DATA AND METHODS

The data sources and methods used in this thesis are the topic of this chapter.

2.1 Data sources

2.1.1 Introduction

There is a paucity of data sources that collect information on the social determinants of health and the health and wellbeing of Aboriginal and Torres Strait Islander Victorians overall. The little data that are collected are not population-representative. For example, administrative data is not population-representative, is often fraught with poor identification of Aboriginal and Torres Strait Islander status, and contains little if any social determinant data. Therefore, the best sources of data that collect information on the social determinants of health are population-representative cross-sectional surveys.

There are three cross-sectional surveys in Australia that capture information on Aboriginal and Torres Strait Islander Victorians: The National Aboriginal and Torres Strait Islander Social Survey (NATSISS); the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS); and the Victorian Population Health Survey (VPHS). While the two national surveys have a higher sample size and response rate than the Victorian Population Health Survey, neither survey contains a non-Aboriginal and Torres Strait Islander comparison group. In addition, separating the national surveys into a health and a social survey means that the social determinants are largely captured in the social survey but the health outcomes are largely captured in the health survey. Therefore, the only data source currently available that is suitable for investigating the social determinants of health in the context of the health gap between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians is the Victorian Population Health Survey.

The Victorian Population Health Survey, conducted annually since 2001 with a sample size of approximately 7,500, typically only recruited 50 to 60 people per survey who identified as Aboriginal or Torres Strait Islander—a sample size too small to provide reliable estimates by Aboriginal and Torres Strait Islander status. However, in 2008, the total sample size was increased to approximately 34,000 in order to provide estimates of the data at the level of the local government area (LGA), of which there are 79 in Victoria.

The Victorian Population Health Survey is only conducted at the larger sample size every three years and these surveys are referred to as the 'LGA-level' surveys. It was therefore fortuitous, but not planned, that the 2008 survey recruited 339 who identified as Aboriginal and/or Torres Strait Islander—a sufficient sample size to analyse the data by Aboriginal and Torres Strait Islander status.

The findings in chapters 3, 4, and 5 are based on the analysis of the 2008 Victorian Population Health Survey, while the findings in chapters 6 and 7 are based on the analysis of three combined Victorian Population Health Surveys—the 2011, 2012 and 2014 surveys.

The 2011, 2012 and 2104 surveys were combined because the 2011 and 2014 Victorian Population Health Surveys LGA-level surveys failed to recruit a sufficient number of adults who identified as Aboriginal and Torres Strait Islander. This was due to changes in the technology of communications with the advent and rapid uptake of the mobile telephones—an uptake that has been particularly high among younger populations such as the Aboriginal and Torres Strait Islander population. All the Victorian Population Health Surveys conducted prior to 2015 only surveyed households with landline telephone connections. Households with landline telephone connections are rapidly being replaced by households that only have mobile telephones with the landline telephone connection consequently becoming redundant. In 2015, the Victorian Population Health Survey methodology was updated to survey both landline and mobile telephones. The first LGA-level survey to survey both landline and mobile telephones was the 2017 survey. However, the data from the 2017 survey is still not yet available for public use.

2.1.2 The 2008 Victorian Population Health Survey

The survey type and scope

The 2008 Victorian Population Health Survey was a computer-assisted telephone interview survey of a randomly selected sample of adults, aged 18 years or older, who resided in private dwellings in Victoria and had access to a landline telephone. Population groups who were excluded from the survey included adults who were homeless or itinerant, adults in hospitals or institutions, and adults who were too frail, aged, or had disabilities that precluded their participation in an interview.

To ensure the representativeness of adults who spoke a language other than English, where necessary, interviews were conducted in eight languages—Italian, Greek, Mandarin, Cantonese, Vietnamese, Arabic, Turkish, and Serbo-Croatian.

Sampling frame

The sampling frame was an electronic listing of Victorian telephone exchange prefixes and localities. Random digit dialling was used to generate a sample of telephone numbers that formed the household sample. Only one person aged 18 years or older, per household, with the most recent birthday, was selected for interview.

Sample size

The sample was stratified by LGA with a target sample of 426 individuals per LGA. The total sample achieved was 34,168 adults, including 339 Aboriginal and Torres Strait Islander respondents.

Response rate

The response rate, defined as the proportion of households where contact was made and an interview completed, was 64.9%.

Weighting

In order to control for participation bias, the survey data were weighted to reflect: (1) the probability of selection of the household and respondent within the household; and (2) the age, sex, and geographic distribution of the 2007 estimated resident population of Victoria provided by the Australian Bureau of Statistics.

First, a selection weight was calculated using the formula: $sw = nah/npl$, where:

nah = the number of adults aged 18 years or over in the household

npl = the number of telephone lines in the household.

Second, a population benchmark ($pbmark$) component to ensure that the sample distribution matched the 2007 estimated resident population was calculated. The categories used were age—18–24 years, 25–34, 35–44, 45–54, 55–64 and 65 years +; sex—male and female; and geographic area—the 79 LGAs of Victoria.

The population benchmark component was calculated by dividing the population of each cross-cell by the sum of the selection weight components for all the respondents in the sample within that cross-cell using the formula: $pbmark_i = Ni/\sum sw_{ij}$, where:

i = the i th cross-cell j = the j th person in the cross-cell

N_i = the population of the i th cross-cell

$\sum sw_{ij}$ = the sum of selection weights for all respondents (1 to j) in the i th cross-cell.

Third, the final weight (the person weight) applied to each survey respondent was calculated using the formula: $pwt_{ij} = sw_{ij} * pbmark_i$ where:

i = the i th cross-cell

j = the j th person in the cross-cell.

Ethics statement

The Department of Health Human Research Ethics Committee approved the survey in accordance with the guidelines of the Declaration of Helsinki. While it is strongly recommended that any research conducted in Aboriginal and Torres Strait Islander peoples be evaluated according to the National Health and Medical Research Council guidelines for ethical conduct in Aboriginal and Torres Strait Islander health research (revised in 2018), this was not done because the survey was not designed to answer a research question about the Aboriginal and Torres Strait Islander population (National Health and Medical Research Council 2003). Aboriginal and Torres Strait Islander status was ascertained for demographic purposes.

2.1.2 The 2011, 2012 and 2014 Victorian Population Health Surveys

Due to the successful advocacy of the author of this thesis, a question about experiences of racism was included in the 2011 and 2012 Victorian Population Health Surveys, to enable investigation of the psychosocial risk factor of experiences of racism. The question was: “How often, if at all, have you received unfair treatment in the last 12 months because you are an Aboriginal or Torres Strait Islander?”

This question was modified in the 2014 Victorian population Health Survey to make it more broadly applicable. Survey respondents were asked: “In the last 12 months, have you experienced discrimination or been treated unfairly because of your racial, ethnic, cultural, or religious background?” Although the two questions about experiences of racism were different, in order to be able to obtain a sufficient number of survey respondents who identified as Aboriginal and Torres Strait Islander, the 2011, 2012, and 2014 surveys were combined. The work in this thesis on experiences of racism is therefore based on the combined dataset and makes the assumption that the two questions about experiences of racism were similar enough to be combined. The publication arising from chapter 6 discusses in detail the implications of this assumption.

Sampling frame

Victorian Population Health Surveys up to and including 2009, used a ‘list assisted’ form of random digit dialling for the sampling frame. While list-assisted random digit dialling approaches have provided a good contemporary coverage of households with a landline telephone connection, they tend to under-represent phone numbers in new exchanges and generate a relatively high proportion of non-working telephone numbers. Therefore, an exchange-based approach to random digit dialling was employed for the first time in 2010 and thereafter, using a commercial list provider to provide the sampling frame.

Sample size

Three Victorian Population Health Survey datasets were combined to attain a sufficient number of adults who identified as Aboriginal and Torres Strait Islander. This included data from the 2011 survey (n = 33,673), the 2012 survey (n = 7,533), and the 2014 survey (n = 33,654). All non-Aboriginal and Torres Strait Islander respondents from the 2011 and 2012 surveys were excluded because they were not asked about experiences of racism. The combined dataset was stratified by departmental region, of which there were eight at that time, and the final sample size was 33,833 including 387 respondents who identified as Aboriginal and Torres Strait Islander. Of the 387 respondents, 328 identified as Aboriginal, 39 as Torres Strait Islander, and 20 as both Aboriginal and Torres Strait Islander.

Response rate

The response rate was 67% for the 2011 survey, 69% for the 2012 survey, and 70% for the 2014 survey.

Weighting

Once the three datasets were combined, they were reweighted using the method described for the weighting of the 2008 Victorian Population Health Survey with three differences:

1. The combined dataset was stratified by the 8 department regions of Victoria because the 2012 survey was conducted at the smaller state-wide sample size.
2. The population benchmark (*pbmark*) component also included Aboriginal and Torres Strait Islander status—Aboriginal and Torres Strait Islander, non-Aboriginal and Torres Strait Islander, and unknown.
3. To maximise the accuracy of the standard errors calculated, the weights were normalised using the following formula as recommended by the Australian Bureau of Statistics when combining datasets (Australian Bureau of Statistics 2008):

		}			
		n_h			
$\tilde{\omega}_{ih} =$	ω_{ih}	}			
		N_k			
Where					
$\tilde{\omega}_{ih}$ is the normalized weight for unit i in region h					
ω_{ih} is the original person weight for unit i in region h					
n_h is the sample total in region h					
N_h is the population total in region h					

Ethics statement

As with the 2008 Victorian Population Health Survey, the Department of Health Human Research Ethics Committee approved the 2011, 2012, and 2014 surveys in accordance with the guidelines of the Declaration of Helsinki, but did not refer to the National Health and Medical Research Council guidelines for ethical conduct in Aboriginal and Torres Strait Islander health research because the survey was not designed to answer a research question about the Aboriginal and Torres Strait Islander population (National Health and Medical Research Council 2003).

2.2 Study variables

The study variables and the survey questions from which they were derived are summarised in the Appendix.

2.2.1 Study variables common to chapters 3–7

Variables that were common to all five of the results chapters include age, sex, Aboriginal and Torres Strait Islander status, and total annual household income.

Aboriginal and Torres Strait Islander status was determined by asking survey respondents: “Are you of Aboriginal or Torres Strait Islander origin?”

Total annual household income, a measure of socioeconomic status, was determined by asking the survey respondent to indicate the range of their household's approximate income, from all sources (including social security payments, child support, and investments) before tax is taken out, over the last 12 months.

2.2.2 Study variables of chapter 3

The results presented in chapter 3 attempted to quantify the gap in various social determinants, behavioural risk factors (also known as lifestyle risk factors), health services use, and health outcomes between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults who live in the state of Victoria. Aboriginal and Torres Strait Islander status was coded as a binary variable: 0 = no and 1 = yes. Missing data (0.3%) was excluded.

The social determinants

The social determinants explored included two measures of socioeconomic status, three psychosocial factors, and nine measures of social capital. The two measures of socioeconomic status included total annual household income (HI) and employment status, for which six binary variables were derived: (1) HI less than \$80,000; (2) HI less than \$40,000; (3) HI less than \$20,000; (4) unemployed, (5) not in the labour force, and (6) unable to work.

The three psychosocial factors investigated were food insecurity, financial stress, and psychological distress, for which four binary variables were derived: (1) ran out of food in past 12 months and could not afford to buy more; and (2) unable to raise \$2,000 within two days in an emergency; (3) high psychological distress; and (4) very high or high psychological distress.

The Kessler 10 Psychological Distress Scale (K10) was used to determine the respondent's level of psychological distress in the four weeks preceding the survey (Kessler et al. 2002). A survey respondent was deemed to have high psychological distress if they had a K10 score \geq 22, and very high psychological distress if they had a K10 score \geq 30.

The measures of social capital investigated included the respondent's social and physical environment, social and support networks, and level of social and civic trust. Nine binary variables were derived: (1) lived in neighbourhood for less than one year; (2) unable to get help from family; (3) unable to get help from neighbours; (4) unable to get help from friends; (5) attended a support group meeting; (6) unable to get access to community services and resources; (7) did not believe that most people could not be trusted; (8) did not feel valued by society; and (9) not a member of a sports, church, school, professional, and / or other community group.

The behavioural risk factors

The behavioural risk factors investigated included smoking, excessive consumption of alcohol, overweight and obesity, physical inactivity, inadequate fruit and vegetable consumption, and

hypertension. A survey respondent was deemed to be a current smoker if they reported smoking daily or occasionally and a binary variable was derived.

Excessive alcohol consumption was determined by comparing the respondent's pattern of alcohol consumption with the *2001 Australian recommended guidelines* (National Health and Medical Research Council 2001). Three binary variables of excessive alcohol consumption were derived based on the 2001 cut-off for being at short-term risk of alcohol-related harm: (1) at least once a year, (2) at least once a month, and (3) at least once a week.

Survey respondents were asked to report their height and body weight, and this was used to calculate their body mass index (BMI). The respondent was deemed to be overweight if their BMI was 25.0–29.9 kg/m² or obese if their BMI was 30 kg/m² or more, based on the recommendations of the WHO (World Health Organization 1997). Two binary variables were derived: (1) overweight or obese; and (2) obese.

Survey respondents were asked a series of questions about their physical activity levels over the week prior to the interview. Their responses to the questions were compared with the recommendations of the *1999 National Physical Activity Guidelines for Australians* and a binary variable derived: inadequate physical activity—defined as less than 150 minutes of physical activity in total or ≥ 150 minutes but fewer than 5 sessions per week (Department of Health 1999) (Department of Health 1999).

Survey respondents were asked to report the average number of serves of fruit and vegetable they usually consumed each day and the responses were compared with the recommendations of the *2003 Dietary guidelines for Australian adults* (National Health and Medical Research Council 2003). Two binary variables: (1) inadequate fruit intake (defined as less than 2 serves per day) and (2) inadequate vegetable intake (defined as less than 5 serves per day).

Survey respondents were asked if they had ever been diagnosed by a doctor with high blood pressure and a binary variable was derived.

The health services

The healthcare services investigated included: whether a health professional had performed a check on the survey respondent's blood pressure, cholesterol and/or blood glucose in the previous two years; attendance at a public hospital in the previous year; consultation with a health professional for a mental health related problem in the previous year; consultation with an eye health professional; and bowel cancer screening in the previous two years. Binary variables were derived for each service.

The health outcomes

The health outcomes investigated included self-reported health status and doctor-diagnosed cancer, depression and / or anxiety, asthma (past and in the preceding 12 months), and/or arthritis. While data on type 2 diabetes, stroke, and heart disease was also collected, the

sample of Aboriginal and Torres Strait Islander peoples reporting these was too small to analyse.

Self-reported health status has been shown to be a reliable predictor of ill-health, future healthcare use and subsequent mortality (Burstrom and Fredlund 2001). Survey respondents were asked to rate their general health as: excellent, very good, good, fair, or poor. A binary variable was derived: fair or poor self-reported health.

Coding of the variables

All binary variables were coded as follows: 0 = no and 1 = yes.

Missing data

Less than 2% of respondents refused to answer or were unable to answer the survey questions for all variables with the exception of total annual household income (18%), BMI (6%), physical activity (5%), psychological distress (4%), the ability to get help from neighbours (3%), and 'did not feel valued by society' (6%). Missing data was excluded from the analysis. The models were rerun with the missing data included in the denominator, but this made negligible difference to the results.

2.2.3 Study variables of chapter 4

The results presented in chapter 4 investigated the relationship between food insecurity and Aboriginal and Torres Strait Islander status. Food insecurity was the dependent variable. A respondent was judged to be food insecure if they responded in the affirmative to the question: "In the last 12 months, were there any times that you ran out of food, and couldn't afford to buy more?" The reference group consisted of those who had not experienced food insecurity in the previous 12 months.

Aboriginal and Torres Strait Islander status was the primary independent variable of interest and was derived as a binary variable. Independent variables that were hypothesized a priori to be associated with food insecurity included: the socio-demographic variables of age, sex, household composition (lone parenthood, household with a child and household size), and geographic location (rurality); socioeconomic status (total annual household income); social capital (social support); and behavioural risk factors (smoking, excessive alcohol consumption and obesity).

How the data on total annual household income and the behavioural risk factors were collected and the variables derived is previously described in section 2.2.1 and 2.2.2, respectively.

Social support was measured by asking the survey respondent three questions: "when needed are you able to get help from (1) family, (2) neighbours, and (3) friends?" Survey respondents were considered to reside in rural Victoria if they were resident outside the metropolitan area of Melbourne within the state of Victoria.

Coding of the variables

The dependent and all independent variables, with the exception of total annual household income, age, and household size, were binary and the code 0 represented the reference group. Aboriginal and Torres Strait Islander status, smoking, excessive alcohol consumption, obesity, lone parenthood, and households with a child were coded as 0 = no and 1 = yes. Sex was coded as 0 = male and 1 = female. The ability to get help from family, friends or neighbours was coded as 0 = yes and 1 = no. Rurality was coded as 0 = metropolitan, and 1 = rural. Total annual household income and age were categorical with the highest income and oldest age category as the referent groups. Household size was treated as a continuous variable.

Missing data

The regression models were rerun with the missing data included in the denominator, but this made negligible difference to the findings.

2.2.4 Study variables of chapter 5

The results presented in chapter 5 investigated the relationship between psychological distress and Aboriginal and Torres Strait Islander status. Psychological distress was the dependent variable and was measured using the Kessler 10 Psychological Distress Scale (K10), that has been validated in the Australian population (Andrews and Slade 2001). A binary variable was derived where psychological distress was defined as a K10 score of 22 or more. The reference group consisted of those who scored less than 22.

Aboriginal and Torres Strait Islander status was the primary independent variable of interest and was treated as a categorical variable. Secondary independent variables of interest hypothesised a priori to be associated with psychological distress were: the socio-demographic variables of age, sex, rurality, marital status, household composition (presence of a child in a household, lone parenthood, and household size) and rurality; socioeconomic status (household income, employment status, education, home ownership, financial stress, and food insecurity); and social capital (social contact, neighbourhood tenure, perceptions of neighbourhood, social support, social and civic trust).

How the data on total annual household income, the behavioural risk factors, and social support were collected is previously described in section 2.2.1, 2.2.2, and 2.2.3, respectively.

Socioeconomic status

Six measures of socioeconomic status were investigated: (1) total annual household income; (2) employment status; (3) highest level of educational attainment; (4) home tenure; (5) financial stress; and (6) food insecurity. Financial stress was defined as being unable to raise \$2,000 within 2 days in an emergency. All variables were categorical.

Social capital

The three domains of social capital measured were: (1) the social environment (social contact, neighbourhood tenure, and perceptions of the residential neighbourhood); (2) social support (ability to get help from family, neighbours, and friends); and (3) social and civic trust. All variables were categorical.

Level of social contact was assessed by asking survey respondents how many people they had spoken with on the previous day. Neighbourhood tenure was assessed by asking how long the survey respondent had lived in their neighbourhood. Perceptions of the residential neighbourhood were assessed by asking the survey respondent a series of six questions about how they would rate the area in which they lived for: (1) easy access to recreational and leisure facilities such as parks, bike tracks and recreational areas; (2) good facilities and services such as shops, childcare, schools and libraries; (3) opportunities to volunteer in local groups; (4) a wide range of community and support groups; (5) being an active community where people do things and get involved in local issues and activities; and (6) being a pleasant environment with nice streets, well planned, and open spaces. A composite variable was subsequently derived based on the number of negative answers.

Social trust was assessed by asking two questions: “Do you feel safe walking alone down your street after dark?” and “Do you agree that most people can be trusted?”. Civic trust was assessed by asking two questions: “Do you feel valued by society?” and “Do you feel there are opportunities to have a real say on issues that are important to you?”

Coding of the variables

All independent variables, except sex and rurality, were categorical and the reference groups are clearly indicated in Tables 1–2 of the publication appended at the end of Chapter 5. Sex was coded as 0 = male and 1 = female. Rurality was coded as 0 = metropolitan, and 1 = rural.

Missing data

Missing data was excluded for the dependent variable but retained as a category for all independent variables.

2.2.5 Study variables of chapter 6

The results presented in chapter 6 sought to quantify the population-based prevalence of racism experienced by Aboriginal and Torres Strait Islander Australians who lived in the state of Victoria and to determine if the experiences of racism were independent of behavioural risk factors and social determinants that are often used to justify racism.

An experience of racism (also known as perceived racism or self-reported racism) in the last 12 months was the dependent variable. The reference group consisted of those who had not experienced racism in the previous 12 months. Aboriginal and Torres Strait Islander status was the primary independent variable of interest and was treated as a categorical variable.

Experiences of racism were assessed by asking Aboriginal and Torres Strait Islander survey respondents the following question in the 2011 and 2012 surveys: “How often, if at all, have you received unfair treatment in the last 12 months because you are Aboriginal or a Torres Strait Islander?” In the 2014 survey all survey respondents were asked the question “In the last 12 months, have you experienced discrimination or been treated unfairly because of your racial, ethnic, cultural, or religious background?”

The social determinants

The social determinants investigated included: the socio-demographic characteristics of age, sex, rurality; socioeconomic status (total annual household income, educational attainment, and employment status); and social capital (social support, social and civic trust). The measures of social support were the same as those described in section 2.2.3 and the measures of social and civic trust were the same as those described in section 2.2.4.

The behavioural risk factors

The behavioural risk factors investigated included: smoking, alcohol consumption, unhealthy body weight, and physical inactivity. The details of how this data was collected is described previously in section 2.2.2. However, in this investigation the derived variables were treated as categorical rather than binary.

Coding of the variables

All independent variables, except sex and rurality, were categorical and the reference groups are clearly indicated in Tables 1–3 of the publication appended at the end of Chapter 6. Sex was coded as 0 = male and 1 = female. Rurality was coded as 0 = metropolitan, and 1 = rural.

Missing data

Missing data was excluded for the dependent variable but retained as a category for all independent variables.

2.2.6 Study variables of chapter 7

This results presented in chapter 7 sought to determine and quantify the contribution of experiences of racism compared with behavioural risk factors and socioeconomic status to the gap in self-reported health status between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults living in Victoria.

Survey respondents were asked to indicate whether they would describe their overall health status as excellent, very good, good, fair, or poor, and a binary variable derived. Poor self-reported health status was the dependent variable and the reference group consisted of those who reported that they were in fair, good, very good, or excellent health. Aboriginal and Torres Strait Islander status was the primary independent variable of interest and was treated as a categorical variable.

Secondary independent variables of interest

The secondary independent variables of interest that were investigated included: age; sex; experiences of racism; socioeconomic status (total annual household income); and the behavioural risk factors of smoking, alcohol consumption, unhealthy body weight, and physical inactivity. Experiences of racism were determined as described in section 2.2.5. However, in this investigation experiences of racism were treated as an independent categorical variable. Similarly, the details of how the data for total annual household income and the behavioural risk factors were collected are described previously in sections 2.2.1 and 2.2.2, although in this investigation the derived variables were treated as categorical rather than binary.

Coding of the variables

All independent variables, except sex and rurality, were categorical and the reference groups are clearly indicated in Tables 1–2 of the publication appended at the end of Chapter 7. Sex was coded as 0 = male and 1 = female. Rurality was coded as 0 = metropolitan, and 1 = rural.

Missing data

Missing data was excluded for the dependent variable but retained as a category for all independent variables.

2.3 Statistical methods

2.3.1 Statistical software

The survey data was analysed using the Stata statistical software package version 12 (Stata 2012). The Stata survey (svy) commands were used which were designed specifically for analysing data from surveys. Before any of the survey estimation commands can be used, the svyset command was used to specify the variables that describe the stratification, sampling weight, and primary sampling unit variables. These commands correct the standard errors for the effects of clustering and stratification, as well as the impact of sampling weights when computing the 95% confidence intervals (StataCorp 2011). The three variance estimation methods available for use with the svy command are: balanced repeated replication; the jackknife; and first-order Taylor linearization. By default, the svy command computes standard errors using the first-order Taylor linearization method and it is the default method that is used for all the calculations of standard error in this thesis.

2.3.2 Descriptive analysis

Age-standardised prevalence estimates were calculated using the direct method of age-standardisation to control for the different age structures of the Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander populations of Victoria (Kirkwood and Sterne 2003). The standard population used was the 2006 estimated resident population of Victoria using 10-year age groups.

Statistical reliability of the prevalence estimates was assessed by calculating relative standard errors (RSEs). RSEs of less than 25% were deemed to indicate an acceptable level of reliability.

To determine significant differences in the prevalence of the social determinants of health, behavioural risk factors, health service use, and health outcomes, prevalence ratios (PR) were calculated using a generalised linear model with a log link and binomial distribution (Deddens and Petersen 2008). The prevalence ratios were adjusted for sex (male or female) and age (18–29 years; 30–39; 40–49; 50–59; 60–69; 70–79; and 80 years and older). Statistical significance was accepted at the $p < 0.05$ level.

2.3.3 Regression analysis

To further explore statistically and clinically significant disparities in selected social determinants identified in the descriptive analysis and the literature, logistic regression was employed. The dependent variables were the selected social determinants and the primary independent variable of interest was Aboriginal and Torres Strait Islander status.

Univariable logistic regression was used to identify statistical associations between secondary independent variables of interest and the dependent variable, hypothesised a priori to be potentially associated with the dependent variable.

Bivariable logistic regression was then used to investigate the impact of every secondary independent variable of interest found to be statistically associated with the dependent variable, on the association between the dependent and primary independent variable of interest—Aboriginal and Torres Strait Islander status. It was posited that any secondary independent variable of interest that changed the measure of association (odds ratio) between the dependent and primary independent variable of interest by 10% or more was a potential explanatory variable (McNamee 2003).

Multivariable logistic regression was then used to investigate the contribution of all potential explanatory independent variables. Where the association between the dependent and primary independent variable of interest was rendered no longer statistically significant at the $p \leq 0.05$ level, the secondary independent variables of interest included in the model were judged to largely explain the association. The term “largely” rather than “fully” is used in recognition of the fact that any p-value used to declare statistical insignificance is essentially arbitrary.

Interaction terms were fitted between the main independent variable of interest (Aboriginal and Torres Strait Islander status) and all secondary independent variables of interest found to be statistically significantly associated with the dependent variable, to test for interaction. The adequacy of the final model was examined using the Hosmer-Lemeshow goodness-of-fit test developed specifically for complex survey data (Archer et al. 2007).

2.4 References

Andrews, G. and T. Slade (2001). "Interpreting scores on the Kessler Psychological Distress Scale (K10)." Australian and New Zealand Journal of Public Health **25**(6): 494-7.

Archer, K., S. Lemishow and D. Hosmer (2007). "Goodness-of-fit tests for logistic regression models when data are collected using a complex sampling design." Computational Statistics and Data Analysis **51**: 4450-64.

Australia Bureau of Statistics. (2008). "Frequently Asked Questions - Tips for using CURFs - How should I use survey weights in my model?" <http://www.abs.gov.au/websitedbs/D3310114.nsf/4a256353001af3ed4b2562bb00121564/d4b021fd647c719cca257362001e13dc!OpenDocument>'.

Burstrom, B. and P. Fredlund (2001). "Self rated health: Is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes?" Journal of Epidemiology and Community Health **55**(11): 836-40.

Deddens, J. A. and M. R. Petersen (2008). "Approaches for estimating prevalence ratios." Occupational and Environmental Medicine **65**(7): 481, 501-6.

Department of Health (1999). "National physical activity guidelines for adults." Canberra.
Kessler, R. C., G. Andrews, L. J. Colpe, E. Hiripi, D. K. Mroczek, S. L. Normand, E. E. Walters and A. M. Zaslavsky (2002). "Short screening scales to monitor population prevalences and trends in non-specific psychological distress." Psychological Medicine **32**(6): 959-76.

Kirkwood, B. R. and J. C. Sterne (2003). Essential Medical Statistics, Blackwell Publishing.

McNamee, R. (2003). Confounding and confounders. Occupational and Environmental Medicine **60**(3): 227-34.

National Health and Medical Research Council (NHMRC) (2001). "Australian alcohol guidelines: health risks and benefits." Canberra.

National Health and Medical Research Council (NHMRC) (2003). "Dietary guidelines for Australian adults." Canberra.

National Health and Medical Research Council. (2003). "National Health and Medical Research Council (NHMRC) Values and Ethics - Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research." Retrieved 17-May-2020, from <https://www.nhmrc.gov.au/research-policy/ethics/ethical-guidelines-research-aboriginal-and-torres-strait-islander-peoples>.

Stata. (2012). Stata statistical software: release 12. College Station, TX: StataCorp LP. <http://www.stata.com/>.

StataCorp. (2011). "The survey data reference manual. Available at: <http://www.stata.com/features/survey-data/svy-survey.pdf>." from <http://www.stata.com/>.

World Health Organization (WHO) (1997). "Obesity, preventing and managing the global epidemic. Report of a WHO consultation on obesity." Geneva.

CHAPTER 3: INEQUALITIES IN THE HEALTH AND THE DETERMINANTS OF HEALTH OF ABORIGINAL AND TORRES STRAIT ISLANDER ADULTS WHO LIVE IN VICTORIA

This chapter included a peer-reviewed paper that was published in the *International Journal for Equity in Health* (attached at the end of the chapter)

Markwick, A., Ansari, Z., Sullivan, M., Parsons, L., and McNeil, J. (2014). "Inequalities in the social determinants of health of Aboriginal and Torres Strait Islander people: a cross-sectional population-based study in the Australian state of Victoria." *International Journal for Equity in Health* **13**: 91–103.

3.1 Introduction

The literature review in chapter 1 identified key social determinants of Aboriginal and Torres Strait Islander health in Australia. While the WHO recognises 10 social determinants of health (socioeconomic status, stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport), additional social determinants pertaining to Aboriginal and Torres Strait Islander Australians that reflect the past and ongoing process of colonisation were also identified (poverty, housing, racism, marginalisation, incarceration, the justice system, family separation, cultural genocide, assimilation, and transgenerational collective trauma).

However, the majority of the studies that contributed to the identification of the social determinants of health specifically pertaining to Aboriginal and Torres Strait Islander Australians, were conducted in parts of Australia other than the state of Victoria. Since Aboriginal and Torres Strait Islander Australians are as culturally, linguistically and experientially diverse, as for example the peoples of Europe, it cannot be assumed that findings in Aboriginal and Torres Strait Islander peoples who live in one state of Australia are representative of Aboriginal and Torres Strait Islander peoples who live in another state of Australia. Therefore, the purpose of this chapter was to identify inequalities in the health and wellbeing of Aboriginal and Torres Strait Islander peoples who live in the state of Victoria, and to identify potential key social determinants for further investigation.

A major reason why there are few studies reported in the literature with a specific focus on Aboriginal and Torres Strait Islander peoples in Victoria is because Aboriginal and Torres Strait Islander peoples only represent 0.9% of the Victorian population—the lowest proportion of all Australian states and territories. This means that population-representative data, such as that obtained through population surveys, need to be conducted at very large sample sizes in order to recruit a sufficient number of Aboriginal and Torres Strait Islander Victorians.

The first time that this occurred was in 2008 and the findings in this chapter represent the first systematic population-representative comparison of the health and wellbeing of Victorians by Aboriginal and Torres Strait Islander status.

3.2 Aims

Specifically, the aims of this chapter were to identify and quantify:

1. Inequalities in health outcomes between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults who live in Victoria
2. Inequalities in the prevalence of behavioural risk factors
3. Inequalities in health service use
4. Inequalities in the social determinants of health

And then to select key social determinants for further investigation.

3.3 Summary

A cross-sectional descriptive analysis of survey data from the Victorian Population Health Survey was conducted. Prevalence ratios (PR) using a generalised linear model with a log link function and binomial distribution were used to compare between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults who live in the state of Victoria. All PR were adjusted for sex and age.

Overall, Aboriginal and Torres Strait Islander Victorians had poorer physical and mental health than their non-Aboriginal and Torres Strait Islander counterparts. Aboriginal and Torres Strait Islander Victorians had a significantly higher prevalence of fair or poor self-reported health, - doctor-diagnosed depression and/or anxiety, cancer, asthma, but not arthritis. Of particular note, more than one-third of Aboriginal and Torres Strait Islander adults (34.8%) had ever been told by a doctor that they had depression and/or anxiety, compared with 19.7% of non-Aboriginal and Torres Strait Islander adults—PR = 1.7 (95% confidence interval (CI): 1.4–2.2).

The prevalence of the behavioural risk factors of smoking, obesity and inadequate fruit intake was significantly higher among Aboriginal and Torres Strait Islander compared to their non-Aboriginal and Torres Strait Islander Victorian counterparts. In contrast, there was no difference between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians in the prevalence of excessive alcohol consumption, physical inactivity, hypertension, or inadequate vegetable intake.

The few measures of healthcare included in the survey were health checks (blood pressure, cholesterol, and glucose), attendance at a public hospital, consulting a health professional about a mental health problem, and a bowel examination for bowel cancer. Of these, there were no differences between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians except for blood pressure checks and consulting with a health

professional about a mental health problem, where the prevalence was significantly higher among Aboriginal and Torres Strait Islander adults.

Aboriginal and Torres Strait Islander Victorians had a significantly higher prevalence of the social determinants of low household income, unemployment, inability to work, food insecurity, psychological distress, financial stress, low neighbourhood tenure, inability to get help from family, low social and civic trust, compared to their non-Aboriginal and Torres Strait Islander counterparts. In contrast, there was no difference between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians in the prevalence of the inability to get help from friends or neighbours, and access to community services or resources. Of particular note, were the differences between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians in the prevalence of food insecurity and psychological distress.

Aboriginal and Torres Strait Islander Victorians were more than three times as likely as non-Aboriginal and Torres Strait Islander Victorians to have experienced food insecurity in the 12 months prior to the survey—PR = 3.4 (2.3–5.1). Food insecurity was defined as running out of food and being unable to afford to buy more.

Aboriginal and Torres Strait Islander adults were more than twice as likely as non-Aboriginal and Torres Strait Islander Victorians to have experienced high or very high psychological distress in the four weeks prior to the survey (PR = 2.1; 1.5–2.9) and more than four times as likely to have experienced very high psychological distress (PR = 4.4; 2.6–7.4). Psychological distress was measured using the Kessler 10 Psychological Distress Scale.

3.4 Conclusions

Consistent with the literature, this study found that Aboriginal and Torres Strait Islander adults who live in the state of Victoria had significantly poorer health than their non-Aboriginal and Torres Strait Islander counterparts. Of particular note, was the higher lifetime prevalence of doctor-diagnosed depression and anxiety, experienced by more than one-third of Aboriginal and Torres Strait Islander adults.

Also consistent with the literature were the findings that Aboriginal and Torres Strait Islander adults who live in Victoria were more likely to smoke, be obese, and have an inadequate fruit intake. In contrast, Aboriginal and Torres Strait Islander Victorians were not more likely to be physically inactive, have an inadequate vegetable intake, to engage in the excessive consumption of alcohol, or to have hypertension than their non-Aboriginal and Torres Strait Islander counterparts—not consistent with the literature.

Although the survey only collected limited measures of healthcare utilisation, with the exception of blood pressure screening and visits to a health professional for a mental health related problem, there were no differences between Aboriginal and Torres Strait Islander and

non-Aboriginal and Torres Strait Islander Victorians. This could be interpreted as there being no inequalities in access to or use of healthcare services. However, given that Aboriginal and Torres Strait Islander Victorians have poorer health, one would predict that commensurate with need, Aboriginal and Torres Strait Islander Victorians should have received more healthcare services than non-Aboriginal and Torres Strait Islander Victorians. Therefore, it is possible that Aboriginal and Torres Strait Islander health in Victoria may be negatively impacted by receiving fewer healthcare services than needed.

This is supported by evidence that there is strong resistance by Aboriginal and Torres Strait Islander peoples to using mainstream healthcare services when the service fails to address cultural security, resulting in significant challenges in gaining the trust of Aboriginal and Torres Strait Islander clientele (Coffin 2007). Moreover, there is evidence that Aboriginal and Torres Strait Islander peoples who do use mainstream health services often fail to receive the same quality of care as their non-Aboriginal and Torres Strait Islander counterparts (Mathur et al. 2006) (Hall et al. 2004).

The data show significant inequalities in most of the social determinants investigated, including socioeconomic status, psychosocial risk factors, and social capital. The largest effect sizes observed were for food insecurity and psychological distress.

Psychological distress impacts negatively on health through a number of pathways both directly and indirectly. In addition to being a risk factor for depression and anxiety, psychological distress has been shown to exacerbate poor health, be a risk factor for the incident development of diseases such as coronary heart disease and stroke, and to increase the uptake of unhealthy behaviours, such as smoking (Hamer et al. 2012) (Stansfeld et al. 2002) (Holden et al. 2010).

In addition to the impact that food insecurity has on nutritional intake, food insecurity is associated with a range of social and emotional consequences, including psychological distress, social exclusion, impaired learning, and loss of productivity (King et al. 2012).

Therefore, given:

- 1 There were large inequalities in the prevalence of food insecurity and psychological distress
- 2 That both food insecurity and psychological distress are well documented in the international literature to be implicated in multiple pathways to poor physical and mental health
- 3 That the proportion of the Aboriginal and Torres Strait Islander population affected by food insecurity and psychological distress is substantial—20.3% (13.5–29.4%) and 24.5% (17.5–33.2%) of Aboriginal and Torres Strait Islander adults in Victoria, respectively.

further investigation of these two social determinants will be pursued in this thesis.

While the publication arising from this chapter discusses the strengths and limitations of this study, a further limitation is outlined here. The social determinants measured in the Victorian Population Health Survey largely reflect the 10 social determinants identified by the WHO— socioeconomic status, stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport.

However, the social determinants identified in the literature review (chapter 1) as being key determinants of the health and wellbeing of Aboriginal and Torres Strait Islander Australians, reflecting the past and ongoing process of colonisation, are not included in the survey, except socioeconomic status. These social determinants include poverty, housing, racism, marginalisation, incarceration, the justice system, family separation, cultural genocide, assimilation, and transgenerational collective trauma.

A unifying and underlying theme that connects all the social determinants associated with colonisation is racism (Vickery et al. 2007). Consequently, the author of this thesis successfully advocated for the inclusion of at least one question in the Victorian Population Health Survey on experiences of racism. The datasets that contain this data were subsequently used to investigate the prevalence and potential impact of experiences of racism on the health and wellbeing of Aboriginal and Torres Strait Islander adults in Victoria (see chapters 6 and 7).

Please note that the publication arising from this chapter reported that the prevalence of high or very high psychological distress in Aboriginal and Torres Strait Islander adults was 25.3%. This was based on the exclusion of all missing data in order to be able to calculate a prevalence ratio. However, when the missing data is included in the denominator, the prevalence is 24.5% as reported above, to be consistent with the publication arising from chapter 5.

3.5 References

Coffin, J (2007). "Rising to the challenge in Aboriginal health by creating cultural security." Medical Journal of Australia **31**: 22–4.

Hall, SE., Bulsara, CE., Bulsara, MK., Leahy, TG., Culbong, MR., Hendrie, D., and CD Holman (2004). "Treatment patterns for cancer in Western Australia: does being Indigenous make a difference?" Medical Journal of Australia **181**:191–4.

Hamer, M., Kivimaki, M., Stamatakis, E and GD Batty (2012). "Psychological distress as a risk factor for death from cerebrovascular disease." Canadian Medical Journal Association Journal **184**: 1461–6.

Holden, L., Scuffham, P., Hilton, M., Vecchio, N and H Whiteford (2010). "Psychological distress is associated with a range of high-priority health conditions affecting working Australians." Australian and New Zealand Journal of Public Health **34**: 304–10.

King, S., Moffitt, A., Bellamy, J., Carter, S., McDowell, C and J Mollenhauer (2012). "When there's not enough to eat. A national study of food insecurity among emergency relief clients." State of the family report volume 2. ANGLICARE Australia.

Mathur, S., Moon, L and S Leigh (2006). "Aboriginal and Torres Strait Islander people with coronary heart disease: further perspectives and on health status and treatment." Cardiovascular disease series no. 26. Cat. no. CVD 34, Australian Institute of Health and Welfare, Canberra.

Stansfeld, SA., Fuhrer, R., Shipley, MJ and MG Marmot (2002). "Psychological distress as a risk factor for coronary heart disease in the Whitehall II Study." International Journal of Epidemiology **31**:248–55.

Vickery, J., S. Faulkhead, K. Adams and A. Clarke (2007). "Indigenous insights into oral history, social determinants and decolonisation. " Beyond bandaids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Cooperative Research Centre for Aboriginal Health (CRCATH): 19-36. Darwin.

3.6 Publication

RESEARCH

Open Access

Inequalities in the social determinants of health of Aboriginal and Torres Strait Islander People: a cross-sectional population-based study in the Australian state of Victoria

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Abstract

Introduction: Aboriginal Australians are a culturally, linguistically and experientially diverse population, for whom national statistics may mask important geographic differences in their health and the determinants of their health. We sought to identify the determinants of health of Aboriginal adults who lived in the state of Victoria, compared with their non-Aboriginal counterparts.

Methods: We obtained data from the 2008 Victorian Population Health Survey: a cross-sectional computer-assisted telephone interview survey of 34,168 randomly selected adults. The data included measures of the social determinants of health (socioeconomic status (SES), psychosocial risk factors, and social capital), lifestyle risk factors, health care service use, and health outcomes. We calculated prevalence ratios (PR) using a generalised linear model with a log link function and binomial distribution; adjusted for age and sex.

Results: Aboriginal Victorians had a higher prevalence of self-rated fair or poor health, cancer, depression and anxiety, and asthma; most notably depression and anxiety (PR = 1.7, 95% CI; 1.4–2.2). Determinants that were statistically significantly different between Aboriginal and non-Aboriginal Victorians included: a higher prevalence of psychosocial risk factors (psychological distress, food insecurity and financial stress); lower SES (not being employed and low income); lower social capital (neighbourhood tenure of less than one year, inability to get help from family, didn't feel valued by society, didn't agree most people could be trusted, not a member of a community group); and a higher prevalence of lifestyle risk factors (smoking, obesity and inadequate fruit intake). A higher proportion of Aboriginal Victorians sought help for a mental health related problem and had had a blood pressure check in the previous two years.

Conclusions: We identified inequalities in health between Aboriginal and non-Aboriginal Victorians, most notably in the prevalence of depression and anxiety, and the social determinants of health (psychosocial risk factors, SES, and social capital). This has implications for evidence-based policy development and may inform the development of public health interventions.

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Introduction

Inequalities in health between Aboriginal and Torres Strait Islander people and their non-Aboriginal and Torres Strait Islander counterparts are noted by the World Health Organization (WHO) to be the largest in the world [1]. Nationally, life expectancy for the Aboriginal and Torres Strait Islander population born in 2010–2012, was estimated to be 10.6 years lower than that of the non-Aboriginal and Torres Strait Islander population in males and 9.5 years lower in females [2]. Non-communicable diseases are responsible for 70% of the health gap, leading with cardiovascular disease (23%), followed by diabetes (12%), mental disorders (12%) and chronic respiratory diseases (9%) [3].

Understanding the historical reasons for the ongoing health inequalities of Aboriginal and Torres Strait Islander health is critical in gaining the awareness to successfully engage with Aboriginal and Torres Strait Islander people and together envisaging a way forward. With the colonisation of Australia, the annihilation of the Aboriginal and Torres Strait Islander people began, through widespread massacres and the introduction of previously unknown infectious diseases. By 1850 only 10% of the Aboriginal and Torres Strait Islander population remained alive [4]. Aboriginal and Torres Strait Islander people were dispossessed of their lands and subsequently segregated onto reserves or missions. Government assimilation policies oversaw the widespread destruction of families and communities through the removal of their children, commonly referred to as the 'stolen generations' [5]. As Tom Calma, former Aboriginal Social Justice Commissioner stated; "*Indigenous peoples are not merely 'disadvantaged citizens'. The poverty and inequality that they experience is a contemporary reflection of their historical treatment as peoples. The inequality in health status that they continue to experience can be linked to systemic discrimination*" [6].

Tom Calma went on to say that recognising the contemporary impact of colonisation on Aboriginal and Torres Strait Islander people remains a major challenge for those who seek to understand the determinants of health among Aboriginal and Torres Strait Islander communities. Essentially, colonisation created significant barriers towards improving the health of Aboriginal and Torres Strait Islander people, and these barriers work on many levels; physician-patient interaction, delivery of health services as a whole, and the wider political and economic stage. Strategies and interventions need to be implemented at each of these levels to help create a holistic and culturally sensitive approach towards improving the health of Aboriginal and Torres Strait Islander people.

At the level of health care, it is necessary to broaden our definitions of health to include the physical, mental, and spiritual wellbeing of entire communities, not just the

symptomatic treatment of the individual. Western biomedical models of health, with their predominant focus on diagnosis, treatment and prevention, have the effect of reducing the Aboriginal and Torres Strait Islander identity to a series of health problems that need fixing. The constant discourse over Aboriginal and Torres Strait Islander dysfunction and inadequacy in public health practice; "disconnects Aboriginal and Torres Strait Islander people from their own identities, in a manner similar to past oppressive policies of colonisation, assimilation and integration" [7]. Moreover, the dominance of the biomedical model has resulted in public health efforts predominately directed at addressing the lifestyle risk factors on a platform of "personal responsibility"; mainly through health education. We believe that this reinforces and perpetuates prejudice and racism; a key determinant of ill-health in Aboriginal and Torres Strait Islander people. Thus, health education in this form is disempowering for Aboriginal and Torres Strait Islander people and reinforces existing feelings of low self-esteem [7,8].

The Aboriginal and Torres Strait Islander construct of health is not just about the physical wellbeing of the individual. It is the social, emotional and cultural wellbeing of the entire community, a concept that is usually ignored by mainstream health services. It is therefore unsurprising that mainstream health services face additional challenges in trying to gain the trust of Aboriginal and Torres Strait Islander people. In terms of health service delivery, Aboriginal and Torres Strait Islander community controlled health services emphasise the importance of a holistic approach towards Aboriginal and Torres Strait Islander health care, where physical and mental wellbeing is linked to its historical and cultural context. They are also particularly vocal in deploring the lack of time spent on Aboriginal and Torres Strait Islander studies in medical curriculums and are taking the initiative to educate non-Aboriginal and Torres Strait Islander doctors working with their organizations [9].

However, as Aboriginal and Torres Strait Islander Australians are a culturally, linguistically and experientially diverse population, national statistics may mask important geographic differences in their health and the determinants of their health. While the state of Victoria has the second largest population in the country, it has the lowest proportion of Aboriginal and Torres Strait Islander people [10]. In 2011, approximately 47,000 Victorians self-identified as being of Aboriginal and Torres Strait Islander origin; representing 7% of the Australian Aboriginal population and 0.9% of the total Victorian population [10]. There is a paucity of data on the health of Aboriginal and Torres Strait Islander people in Victoria and what is available is often of poor quality.

The Victorian Population Health Survey (VPHS), conducted annually since 2001 with a sample size of

approximately 7,500, typically only recruited 50 to 60 people per survey who identified as Aboriginal or Torres Strait Islander; a sample too small to provide reliable estimates for most of the determinants and outcomes investigated. However, in 2008, the total sample size was increased to approximately 34,000 in order to be able to estimate prevalence at the level of the local government area (LGA). Fortuitously, the larger sample also included 339 Aboriginal and Torres Strait Islander people, a sample that permitted the reliable estimation of the prevalence of most of the determinants and outcomes investigated. Consequently we were able, for the first time, to report on the population health of Aboriginal and Torres Strait Islander people in Victoria [11].

The purpose of this paper is to expand on the initial analysis of the 2008 VPHS data, in order to identify the significant gaps in the determinants of health of Aboriginal and Torres Strait Islander people in Victoria. The analysis was based on a public health model of the social determinants of health, which was used to inform the development of the VPHS [12]. It is important to note however, that the model is based on a western concept of the social determinants of health and therefore precludes information on some of the key determinants of Aboriginal and Torres Strait Islander health. The model posits that the social determinants (socioeconomic, psychosocial risk factors, and community and societal characteristics) impact directly, and indirectly, on the health status of the population via lifestyle risk factors (referred to as disease-inducing behaviours in the model) and access to, and/or use of the health care system. We present data for each of the domains of the model. Data collected by the VPHS for the domain of 'community and societal characteristics' were primarily indicators of social capital and will be referred to as such hereon.

Please note, that from this point forward, for ease of reading, the term Aboriginal will be used to refer to Aboriginal and Torres Strait Islander peoples, but not to undermine their respective distinct identities.

Methods

Data source, sampling frame and sample size

Data were collected as part of the VPHS in 2008, a state-wide computer-assisted telephone interview survey of a randomly selected sample of adults, aged 18 years or older, who resided in private dwellings in Victoria and had access to a landline telephone. The sampling frame was an electronic listing of Victorian telephone exchange prefixes and localities. Random digit dialling was used to generate a sample of telephone numbers that formed the household sample. Only one person aged 18 years or older, per household, with the most recent birthday, was selected for interview. The sample was stratified by LGA;

with a target sample of 426 individuals per LGA. The total sample achieved was 34,168 adults, including 339 Aboriginal respondents. The response rate, defined as the proportion of households where contact was made and an interview completed, was 65 per cent.

Weighting

In order to control for participation bias, the survey data were weighted to reflect the age/sex/geographic distribution of the estimated resident population of Victoria, together with the probability of selection of the household, and respondent within the household. The data was not weighted by ethnicity as the purpose of the survey was to provide prevalence estimates for the Victorian population at the LGA level.

Ethics statement

The Department of Health Human Research Ethics Committee approved the survey in accordance with the guidelines of the Declaration of Helsinki. We did not initially refer to the National Health and Medical Research Council (NHMRC) Values and Ethics - Guidelines for Ethical conduct in Aboriginal and Torres Strait Islander Health Research. as the survey was not conducted specifically to answer a research question about the Aboriginal population [13]. Data on Aboriginal status and ethnicity were collected as demographic variables at the end of the interview, for the purpose of determining how closely the survey sample matched the true Victorian population. It was entirely fortuitous that we recruited a sufficient number of respondents who identified as Aboriginal, to enable this work. Moreover, it is in the nature of CATI surveys that they are conducted anonymously and therefore consent is not specifically obtained from each respondent other than the respondent's verbal agreement to participate in the interview. However, we ensured that the presentation and interpretation of the data was done in ways to avoid harm to Aboriginal people, by consulting and collaborating with the Aboriginal Health Branch in the Department of Health, who have strong links with key Aboriginal organisations such as the Victorian Aboriginal Community Controlled Health Organisation and its component organisations, and the Onemda VicHealth Koori Health unit at the University of Melbourne. This was consistent with the principles of the NHMRC Values and Ethics - Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research.

Statistical analysis

We analysed the survey data using the Stata statistical software package version 12 [14]. We calculated prevalence ratios (PR) using a generalised linear model with a log link function and binomial distribution, and adjusted

for age and sex [15]. We accepted statistical significance at the $p < 0.05$ level.

Coding of variables

Sex was a binary variable and 0 = female (referent group) and 1 = male. Age was stratified by 10-year age groups, where category 1 = 18–29 years (referent group), 2 = 30–39 years, 3 = 40–49 years, 4 = 50–59 years, 5 = 60–69 years, 6 = 70 years and older. All other binary variables were coded as 0 = No (referent group) and 1 = yes.

Variables

We determined Aboriginal status by asking: “Are you of Aboriginal or Torres Strait Islander origin?” Respondents who stated that they were Aboriginal ($n = 258$), Torres Strait Islander ($n = 40$) or both ($n = 41$) were combined and a binary variable created. Only 0.3% of the total sample declined to answer or stated that they did not know, and were coded as missing data.

Indicators of SES included total annual household income (HI) and employment status. We created six binary variables; (1) HI less than \$80,000, (2) HI less than \$40,000, (3) HI less than \$20,000, (4) unemployed, (5) not in the labour force, and (6) unable to work. Household income was defined as total income before tax from all sources including social security payments, child support, and investments over the previous 12 months.

Indicators of psychosocial risk factors included food insecurity, psychological distress and financial stress. We determined that a respondent was food insecure if they answered in the affirmative the following question “In the last 12 months, were there any times that you ran out of food, and couldn’t afford to buy more?” We used the Kessler 10 Psychological Distress Scale (K10) to determine the respondent’s level of psychological distress level in the four weeks preceding the survey [16]. We determined financial stress by asking if, in an emergency, the respondent could raise \$2,000 within two days. We created four binary variables: (1) food insecure, (2) very high psychological distress (K10 score ≥ 30), (3) high/very high psychological distress (K10 ≥ 22), and (4) unable to raise \$2,000.

We assessed the respondent’s social environment by asking about the length of time lived in their neighbourhood (area of residence) and created a binary variable: lived in neighbourhood for less than one year. We determined the respondent’s social and support networks by asking a series of questions: whether they could get help from family, neighbours or friends if needed; if they had attended any support group meetings over the last two years; and if they had access to community services and resources such as libraries, maternal and child health centres, and neighbourhood centres when needed. We created five binary variables: unable to get help from (1) family, (2) neighbours

and/or (3) friends, (4) attended a support group meeting, and (5) unable to get access to community services and resources. We measured the level of social and civic trust by asking the respondent two questions, respectively: “Do you agree that most people can be trusted?”, and “Do you feel valued by society?” We created two binary variables: (1) did not believe that most people could not be trusted (social trust) and (2) did not feel valued by society (civic trust). We determined the level of community and civic engagement by asking the respondent if they were a member of one or more of the following groups: a sports, church, school, professional, and/or other community group. We created a binary variable; not a member of any group.

The lifestyle risk factors that we investigated included: excessive consumption of alcohol; overweight and obesity; smoking; inadequate physical activity; inadequate fruit and vegetable consumption; and hypertension. We determined excessive alcohol consumption by comparing the respondent’s pattern of alcohol consumption with the *2001 Australian recommended guidelines* [17]. If a respondent exceeded the recommended threshold level of alcohol consumption deemed to be safe, they were classified as engaging in excessive alcohol consumption. We created three binary variables of excessive alcohol consumption based on frequency of occurrence: (1) at least once a year, (2) at least once a month, and (3) at least once a week. We calculated body mass index (BMI) based on the respondent’s self-reported height and weight, and categorised body weight status according to the recommendations of the WHO: overweight = BMI 25.0–29.9 kg/m^2 and obesity = BMI $\geq 30 \text{ kg/m}^2$ [18]. We created two binary variables: (1) overweight or obese and (2) obese. We categorised a respondent as being a smoker if they reported smoking daily or occasionally. We measured a respondent’s physical activity level by asking a series of questions about their usual physical activity over the course of a week. We categorised the respondent’s level of physical activity according to the *1999 National Physical Activity Guidelines for Australians* and created a binary variable: inadequate physical activity, defined as less than 150 minutes of physical activity in total or ≥ 150 minutes but fewer than 5 sessions per week [19]. We determined a respondent’s daily fruit and vegetable intake by asking the respondent to report the average number of serves of fruit and vegetable they usually consumed. We categorised the respondent’s intake according to the *2003 Dietary guidelines for Australian adults*, and created two binary variables: (1) inadequate fruit intake (defined as less than 2 serves per day) and (2) inadequate vegetable intake (defined as less than 5 serves per day) [20]. We determined a respondent to be hypertensive by asking if the respondent had ever been diagnosed by a doctor with high blood pressure.

We measured the use of health care services by asking respondents a series of questions which included: whether a health professional had performed a check on their blood pressure, cholesterol and/or blood glucose in the previous two years, if they had attended a public hospital in the previous year, if they had consulted with a health professional for a mental health related problem in the previous year, if they had ever seen an eye health professional, and if they had had a test to detect bowel cancer in the previous two years. We created binary variables for each service. The services represented were chosen to meet the needs of various survey stakeholders. One of the internal stakeholders was the Aboriginal Health Branch in the Department of Health, with strong links to representative organisations of the Aboriginal community in Victoria.

Self-reported health status has been shown to be a reliable predictor of ill-health, future health care use and subsequent mortality [21]. Therefore, we assessed the overall health status of the respondent by asking them to rate their general health as: excellent, very good, good, fair, or poor. We created a binary variable: fair or poor self-reported health. We also asked respondents if they had ever been diagnosed by a doctor with one of the following diseases or conditions: cancer, depression and/or anxiety, asthma (past and in the preceding 12 months), and arthritis. The diseases and conditions were chosen as they represent the national health priority areas of Australia. While data on type 2 diabetes, stroke, and heart disease was also collected, the sample of Aboriginal people reporting these was too small to analyse.

Missing data

Less than 2% of respondents refused to answer or were unable to answer the survey questions for all variables with the exception of total annual household income (18%), BMI (6%), physical activity (5%), psychological distress (4%), the ability to get help from neighbours (3%), and 'did not feel valued by society' (6%). Missing data was excluded from the analysis. The models were rerun with the missing data included in the denominator, but this made negligible difference to any of the results.

Results

Summary

We observed statistically significant differences between Aboriginal and non-Aboriginal Victorians in 14 of the 19 social determinant variables (Table 1) and three of the 7 lifestyle risk factors investigated (Table 2). The greatest effect size was for two of the 4 psychosocial risk factors; very high levels of psychological distress (PR = 4.4; $p < 0.001$) and food insecurity (PR = 3.4; $p < 0.001$). This was followed in decreasing order: unable to work, unemployed, unable to get help from family when needed, high/very high

psychological distress, and lived in the neighbourhood less than one year; all social determinants with prevalence ratios ≥ 2.0 and < 3.0 . Thereafter, all statistically significant prevalence ratios were less than 2.0 in the following descending order: financial stress, smoker, income of less than \$20,000, did not feel valued by society, obese, income of less than \$40,000, did not believe that most people could be trusted, inadequate fruit intake, not a member of a group, and an income of less than \$80,000.

Socioeconomic status

Aboriginal Victorians were significantly more likely than their non-Aboriginal counterparts, to have lower household incomes, be unemployed, and unable to work (Table 1).

Psychosocial risk factors

Aboriginal Victorians had a significantly higher prevalence of all psychosocial risk factors: psychological distress, food insecurity, and financial stress (Table 1).

Social capital

Aboriginal Victorians were significantly more likely than their non-Aboriginal counterparts, to have lived in their neighbourhood for less than one year, be unable to get help from family, have low levels of social and civic trust, and not be a member of a community group (Table 1). By contrast, Aboriginal Victorians were no more or less likely as non-Aboriginal Victorians to be unable to get help from friends and/or neighbours, to attend a support group, and to be unable to access community services and resources.

Lifestyle risk factors

Aboriginal Victorians had a significantly higher prevalence of obesity, smoking, and an inadequate fruit intake (Table 2). By contrast, there were no significant differences between Aboriginal and non-Aboriginal Victorians in the prevalence of excessive alcohol consumption, inadequate physical activity and/or vegetable intake, and hypertension.

Health care

There were no significant differences in health care service use between Aboriginal and non-Aboriginal Victorians, with the exception that Aboriginal Victorians were significantly more likely to have had a blood pressure check, and/or to have sought help from a health professional for a mental health related problem (Table 3).

Health outcomes

Aboriginal Victorians were significantly more likely than their non-Aboriginal counterparts, to report being in fair or poor health, and/or to ever have been diagnosed by a doctor with cancer, asthma (past and present), and

Table 1 Age and sex-standardised prevalence, prevalence ratios and 95% confidence intervals (CI) of social determinants of health, by Aboriginal status

Indicator	Prevalence (%)			Prevalence ratio (95% CI)		
	Age-adjusted		Crude	Non-Aboriginal	Aboriginal (95% CI)	p value
	Non-Aboriginal	Aboriginal	Aboriginal			
Socioeconomic determinants						
Income less than \$80,000	63.7	81.1	79.6	1.00	1.2 (1.1-1.3)	<0.001
Income less than \$40,000	32.4	48.4	44.1	1.00	1.4 (1.2-1.7)	<0.001
Income less than \$20,000	12.4	18.9	17.5	1.00	1.6 (1.1-2.3)	0.014
Unemployed	3.6	8.7	10.2	1.00	2.4 (1.4-4.2)	0.001
Not in labour force	35.5	39.2	33.9	1.00	1.1 (0.9-1.3)	0.444
Unable to work	2.9	7.3	6.8	1.00	2.5 (1.6-4.0)	<0.001
Psychosocial risk factors						
Food insecure	5.4	17.7	20.3	1.00	3.4 (2.3-5.1)	<0.001
High/very high psychological distress ^a	11.6	22.6	25.3	1.00	2.1 (1.5-2.9)	<0.001
Very high psychological distress ^b	3.1	11.3	13.7	1.00	4.4 (2.6-7.4)	<0.001
Financial stress ^c	11.8	19.4	20.7	1.00	1.7 (1.2-2.4)	0.002
Social capital						
Lived in neighbourhood less than 1 year	8.3	14.8	19.4	1.00	2.0 (1.3-3.0)	0.001
Unable to get help from family	7.2	15.2	15.0	1.00	2.1 (1.4-3.2)	<0.001
Unable to get help from neighbours	25.4	26.8	28.8	1.00	1.1 (0.8-1.4)	0.758
Unable to get help from friends	5.0	3.0	3.1	1.00	0.7 (0.4-1.3)	0.231
Attended support group meeting	10.0	14.5	13.7	1.00	1.4 (1.0-2.1)	0.084
Unable to access community services or resources	13.5	13.7	14.9	1.00	1.1 (0.7-1.7)	0.626
Did not believe most people could be trusted (social trust)	20.9	27.3	29.2	1.00	1.4 (1.0-1.8)	0.035
Did not feel valued by society (civic trust)	13.2	18.9	20.1	1.00	1.6 (1.1-2.3)	0.027
NOT a member of a group ^d	38.9	47.6	49.1	1.00	1.3 (1.0-1.5)	0.016

^aKessler Psychological Distress Scale (K10) score ≥ 22 .^bK10 score ≥ 30 .^cUnable to raise \$2,000 within two days in an emergency.^dSports, church, school, professional or other community action group.

depression and anxiety (Table 4). Of particular note was the substantially higher prevalence of depression and anxiety, particularly in Aboriginal men with almost 35% having ever been diagnosed, compared with 14.8% of non-Aboriginal men.

Discussion

We observed a higher prevalence of poor health outcomes among Aboriginal Victorians compared with their non-Aboriginal counterparts, consistent with national findings. Aboriginal Victorians had a higher prevalence of all health outcomes investigated, with the exception of arthritis. Of particular note was the higher prevalence of depression and anxiety, where more than one in three Aboriginal men and women in Victoria had been diagnosed with depression and or anxiety, compared with about one in five non-Aboriginal Victorians. This indicates a priority area for intervention and is supported by

the finding of a higher prevalence of psychological distress among Aboriginal Victorians, a key risk factor for depression and anxiety, suggesting that preventive interventions are also required. The development of preventive measures will require further research to understand the underlying determinants. For example, prejudice and racism have been shown to be a key determinant of Aboriginal health in Australia, and are associated with high levels of psychological distress [22-24].

In investigating the determinants of health, we found significant disparities between Aboriginal and non-Aboriginal Victorians in fourteen of 19 social determinants and three of 7 lifestyle risk factors. The largest effect sizes were in the difference in prevalence of the psychosocial risk factors of psychological distress, food insecurity and financial stress. Psychological distress impacts negatively on health through a number of pathways both directly and indirectly. In addition to being a risk factor for depression and anxiety,

Table 2 Age and sex-standardised prevalence, prevalence ratios and 95% confidence intervals (CI) of lifestyle risk factors, by Aboriginal status

Risk factor	Prevalence (%)			Prevalence ratio (95% CI)		
	Age-adjusted		Crude	Non-Aboriginal	Aboriginal (95% CI)	p value
	Non-Aboriginal	Aboriginal	Aboriginal			
Risky drinker ^a at least yearly	45.7	44.3	50.7	1.00	1.0 (0.9-1.2)	0.789
Risky drinker at least monthly	31.1	29.7	31.8	1.00	1.0 (0.7-1.3)	0.769
Risky drinker at least weekly	17.6	15.7	16.9	1.00	0.9 (0.6-1.6)	0.788
Obese ^b	17.6	24.7	24.6	1.00	1.5 (1.1-2.0)	0.020
Overweight or obese ^c	51.5	57.2	53.7	1.00	1.1 (0.9-1.2)	0.395
Smoker	19.1	30.4	33.9	1.00	1.6 (1.2-2.1)	<0.001
Inadequate physical activity	34.3	35.8	33.9	1.00	1.1 (0.8-1.3)	0.696
Inadequate fruit intake	51.5	63.5	66.1	1.00	1.3 (1.1-1.5)	<0.001
Inadequate vegetable intake	91.8	90.4	90.1	1.00	1.0 (0.9-1.0)	0.153
Hypertensive	26.0	25.6	21.5	1.00	1.0 (0.8-1.3)	0.971

^aAt short-term risk of alcohol-related harm.^bBody mass index (BMI) ≥ 30 kg/m².^cBMI ≥ 25 kg/m².

psychological distress has been shown to exacerbate poor health, be a risk factor for the incident development of diseases such as coronary heart disease and stroke, and to increase the engagement in unhealthy behaviours (lifestyle risk factors) [25-27]. In addition to the impact that food insecurity has on nutritional intake, food insecurity also has a range of social and emotional consequences, such as psychological distress, social exclusion, impaired learning and loss of productivity [28].

Our data shows that socioeconomically, Aboriginal Victorians are severely disadvantaged compared with their non-Aboriginal counterparts, with lower household incomes and lower employment rates. While our data supports a socioeconomic explanation of the inequalities in health of Aboriginal Victorians, the study design was cross-sectional and we can therefore make no claims as to causality or its direction. Nevertheless, the weight of scientific evidence supports a socioeconomic explanation

of health inequalities, as low SES has been shown to have a significant adverse impact on health status [29,30]. Low household income results in less disposable income to purchase healthy foods, engage in leisure time activities that may be an important source of physical activity, and to afford safe and adequate housing and healthcare. Moreover, a low level of educational attainment puts people at higher risk of unemployment, limits their likelihood of obtaining a job that pays a living wage, and is associated with lower levels of health literacy.

Our data shows significant disparities in social capital between Aboriginal and non-Aboriginal Victorians, with Aboriginal Victorians having lower levels. The preponderance of the evidence shows a clear link between social capital and health outcomes, higher levels of social capital being associated with better health and vice versa [31]. While there is no universally agreed definition of social capital, Bourdieu [32] originally defined social capital

Table 3 Age and sex-standardised prevalence, prevalence ratios and 95% confidence intervals (CI) of health care service use, by Aboriginal status

Health care service	Prevalence (%)			Prevalence ratio (95% CI)		
	Age-adjusted		Crude	Non-Aboriginal	Aboriginal (95% CI)	p value
	Non-Aboriginal	Aboriginal	Aboriginal			
Had a blood pressure check ^a	79.6	83.0	79.3	1.00	1.0 (1.0-1.1)	0.001
Had a blood cholesterol check ^a	57.2	59.4	52.1	1.00	1.0 (0.9-1.1)	0.459
Had a blood glucose check ^a	53.6	56.5	50.9	1.00	1.1 (0.9-1.2)	0.457
Attended a public hospital ^b	47.1	50.3	52.0	1.00	1.1 (0.9-1.3)	0.372
Saw professional for mental health ^b	11.3	19.2	20.0	1.00	1.7 (1.1-2.4)	0.008
Ever saw an eye health professional	77.6	75.2	69.8	1.00	1.0 (0.9-1.1)	0.975
Bowel examination for bowel cancer ^a	29.7	36.1	34.9	1.00	1.2 (0.9-1.7)	0.300

^aIn preceding two years.^bIn preceding 12 months.

Table 4 Age and sex-standardised prevalence, and prevalence ratios and 95% confidence intervals (CI) of health outcomes, by Aboriginal status

Health outcome	Prevalence (%)			Prevalence ratio (95% CI)		
	Age-adjusted		Crude Aboriginal	Non-Aboriginal	Aboriginal (95% CI)	p value
	Non-Aboriginal	Aboriginal				
Fair or poor self-reported health	18.1	28.0	26.5	1.00	1.5 (1.1-2.1)	0.006
Cancer ^a	6.4	11.8	7.3	1.00	1.7 (1.0-2.7)	0.042
Depression or anxiety ^a	19.7	34.8	35.2	1.00	1.7 (1.4-2.2)	<0.001
Depression or anxiety - males ^a	14.8	34.9	35.7	1.00	2.5 (1.8-3.7)	<0.001
Depression or anxiety - females ^a	24.4	35.7	34.7	1.00	1.4 (1.0-1.9)	0.028
Ever had asthma ^a	21.2	29.3	31.2	1.00	1.4 (1.1-1.8)	0.018
Currently has asthma ^b	10.7	16.4	16.7	1.00	1.6 (1.1-2.3)	0.023
Arthritis ^a	20.1	23.5	17.8	1.00	1.1 (0.9-1.4)	0.342

^aEver diagnosed by a doctor.^bDiagnosed by a doctor and experienced symptoms in last 12 months.

as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition”. It has been suggested that this definition is more appropriate for Aboriginal peoples given that they continue to be excluded from social networks that could potentially deliver economic and educational benefits [33]. Social capital has been further broken down into three types: bonding, bridging and linking. In the context of Aboriginal communities, bonding social capital refers to relationships within the Aboriginal community, bridging social capital to relationships between the Aboriginal and non-Aboriginal communities, and linking social capital to relationships between the Aboriginal community and the formal and hierarchical institutions of power [34].

It is important to note that social capital is a western concept that has yet to be adapted for the Aboriginal population [33]. Yet it has been suggested that the concept of social capital as defined above may still be a useful tool, particularly in relation to linking social capital [33].

Our data show that Aboriginal Victorians were twice as likely as their non-Aboriginal counterparts to have lived in their neighbourhood for less than one year. Length of neighbourhood tenure is an important indicator of one's social environment. Frequent relocation impacts adversely on educational opportunities, connection to community and services, and social support networks, reducing all three types of social capital [35,36]. This is consistent with their lower SES, as people on low incomes frequently experience periods of unemployment, and are obliged to relocate frequently in search of jobs and affordable housing.

While we did not find any differences between Aboriginal and non-Aboriginal Victorians in the ability to get help from friends and neighbours, Aboriginal Victorians were significantly less able to get help from family, suggesting a lower level of bonding social capital. One

possible explanation for this is that since Aboriginal people in Victoria bore the highest burden of child removal (known as the stolen generations) than any other state in Australia, our finding may reflect the success of past government assimilation policies [37]. Families are an important source of support and lack of family support is likely to increase personal vulnerability, particularly during crises and stressful periods, impacting on health. Our data suggests that Aboriginal Victorians may differ from Aboriginal people who reside in other states, where high levels of bonding social capital have been reported [38]. Moreover, these findings support the development of policies and initiatives to enhance bonding social capital, for example, increased provision of healing centres and programs for the victims of the stolen generations, and support for Aboriginal families.

By contrast, we did not find a difference between Aboriginal and non-Aboriginal Victorians in support group meeting attendance or in the proportion that were able to access community services and resources. However, commensurate with need, it could have been predicted that support group meeting attendance and the proportion that accessed community services and resources would be higher among Aboriginal Victorians. The fact that we did not find this, could be interpreted as suggestive of lower levels of social capital, both linking and bridging. This would be consistent with the finding that Aboriginal Victorians were less likely to belong to a community group (sports, church, school, professional or other action group), also suggestive of lower levels of linking and bridging social capital.

Trust is an important indicator of social capital. Trust within social systems enables cooperative and altruistic behaviours that enhance collective wellbeing and the attainment of collective goals. Trust in our civic institutions and the people who run them, such as our healthcare system, is essential in order to maximise an individual's

health and wellbeing. We found that Aboriginal Victorians were less likely to agree that most people could be trusted or to feel valued by society. The first indicator of trust measures trust in people, essential for the creation of bonding and bridging social capital, while the second indicator measures trust in society, essential for the creation of linking social capital. Our findings of lower levels of trust among Aboriginal Victorians support the interpretation that Aboriginal Victorians have lower levels of all three types of social capital.

Racism has been shown to be a key barrier to the development of both bridging and linking social capital among Aboriginal Australians, and loss of trust has been shown to be a consequence of being a victim of racism [33,39]. Therefore, the lower levels of trust among Aboriginal Victorians may, at least in part, reflect ongoing experiences of social exclusion due to racism. Almost every Aboriginal Victorian who participated in a community survey in 2011 had experienced at least one episode of racism in the 12 months preceding the survey, and more than 70% had experienced eight or more incidents in the year preceding the survey [22]. The consequences of these experiences were that 50% of *all* participants reported high levels of psychological distress and 30% avoided various situations in daily life. Being a victim of racism has deleterious impacts on health via multiple pathways, such as mistrust leading to a reluctance to attend mainstream health services thus presenting late for medical problems, discrimination in the employment market and education system leading to higher rates of unemployment and lower educational attainment, and psychological distress which in turn can lead to mental ill-health and risk-taking behaviours [9,40].

Although our study did not directly measure experiences of racism, it could be contended that we indirectly measured experiences of racism through our measures of trust. Moreover, the 2008 VPHS did ask a question about respondents' views on multiculturalism and found that a substantial proportion of the Victorian adult population (more than one-third) did not agree or only sometimes agreed that multiculturalism made life in their area better [41]. Therefore, we suggest that our data supports the development of policies and interventions to combat racism in Victoria as a means to promoting both bridging and linking social capital among the Aboriginal population, thereby improving health and wellbeing.

The VPHS collects limited data on a variety of health care use. With the exception of blood pressure screens and visits to a health professional for a mental health related problem, there were no differences between Aboriginal and non-Aboriginal Victorians. This could be interpreted as there being no inequalities in relation to access to health care services. However, given that Aboriginal Victorians have poorer health, one would predict that commensurate

with need, Aboriginal Victorians should have received more health care services than non-Aboriginal Victorians. Therefore, it is possible that their health is negatively impacted by receiving fewer health care services than needed. This is supported by evidence that there is strong resistance by Aboriginal people to using mainstream health care services when the service fails to address cultural security, resulting in significant challenges in gaining the trust of Aboriginal clientele [42]. Moreover, there is evidence that Aboriginal people who do use mainstream health services often fail to receive the same quality of care as their non-Aboriginal counterparts. For example; Aboriginal Australians hospitalised with coronary heart disease were considerably less likely to receive key medical investigations and treatment, and those with lung or prostate cancer less likely to receive surgery [43,44].

Had we not chosen to investigate the social determinants of health, these data would have exemplified the biomedical fallacy, that is the error in inferring that the causes of disease in a population can be entirely explained by risk factors in individuals [45]. Typically, the risk factors considered and investigated are the 'lifestyle' risk factors, such as smoking, excessive alcohol consumption, unhealthy body weight, poor diet, and inadequate physical activity; not the psychosocial risk factors. This focus tends to ignore the fact that lifestyle risk factors have been shown to only account for approximately 26% of the total health loss due to death, disease and injury by all causes [46]. Not only did we fail to find any differences in the prevalence of the majority of lifestyle risk factors investigated, but the effect sizes that we observed for smoking, obesity and inadequate fruit intake were relatively small, compared with eight of the social determinants that we investigated. Yet the focus of most mainstream preventive policies and interventions remains around lifestyle risk factors. However, there is strong evidence that addressing psychological distress, and its causes, may be more effective in improving overall health, partly mediated by reducing the higher prevalence of lifestyle risk factors known to be associated with psychological distress, such as smoking [47]. For example, a neighbourhood renewal program in the United Kingdom, which focussed on rebuilding public housing, expectedly reduced the prevalence of mental health problems [48]. However, what was not expected was a concomitant decline in the prevalence of smoking, from 72% to 28% over a five year period, at a time when such declines across the general population were not similarly observed. Therefore, addressing potential antecedents of lifestyle risk factors, such as psychological distress, may prove to be a more effective strategy for improving overall health outcomes than focussing specifically on the lifestyle risk factors. In the case of

smoking, as there has been limited success of the most commonly tried interventions of health education and social marketing, perhaps it is time to consider alternative approaches [49].

The lack of a difference in the prevalence of excessive consumption of alcohol between Aboriginal and non-Aboriginal Victorians is a particularly important finding because the negative stereotype associated with the societal belief that Aboriginal people are more likely to engage in excessive consumption of alcohol, continues to fuel prejudice and racism. Therefore, discrediting negative stereotypes is an important strategy for improving the health of Aboriginal Australians, given the association between health and experiences of racism [4]. It is also worth noting that, consistent with national findings, there was a higher prevalence of Aboriginal Victorians who abstained from alcohol consumption, and in the case of men, Aboriginal men were twice as likely to abstain as their non-Aboriginal counterparts [11].

Strengths and limitations

To the authors' knowledge, this is the first study of its kind in Australia that investigated the health of Aboriginal people compared directly with their non-Aboriginal counterparts using a population-based social determinants approach. It is also the first study of its kind investigating the health of Aboriginal adults in the Australian state of Victoria.

The VPHS is a population representative survey of the adult population of Victoria with a reasonable response rate of 65% in 2008; comparable to that of the 2009 U.S National Health Interview Survey (65%). Moreover, unlike the Australian national surveys, the VPHS includes both Aboriginal and non-Aboriginal adults in the same survey, allowing for direct comparison of the two populations.

There are several caveats to this study. The most important is that the data were obtained from a survey that was not designed to specifically investigate the health of the Aboriginal population. Therefore, the study did not take into consideration the significant cultural differences between the Aboriginal and non-Aboriginal populations, including the Aboriginal concept of health. Moreover, concepts such as social capital are a Western construct that may or may not be applicable to the Aboriginal population. Of perhaps greater importance, the social determinants evaluated were based on an understanding of the health of the general population, and therefore ignored crucial determinants of Aboriginal health such as experiences of racism, the impact of colonisation, connection to country, and the impact of transgenerational social processes such as the stolen generation.

The data are cross-sectional and therefore causality and its direction cannot be inferred with such a study design. The data are self-reported and therefore factors

such as smoking, excessive alcohol consumption and obesity may be under-reported.

Approximately 18% of respondents refused or were unable to indicate their total annual household income, although there was no difference between Aboriginal and non-Aboriginal respondents. However, this measurement error is likely to be randomly distributed across the study population (non-differential misclassification) driving the direction of the association between the outcome and primary exposure variable towards the null [50].

The non-response analysis indicated a selection bias where males and people aged 18 to 34 years were under-represented. This was corrected by weighting the data by the sex, age and geographic distribution of the state as well as the probability of being selected. However, since the survey was conducted using computer-assisted telephone interviewing, a further selection bias was introduced by virtue of the fact that only people who could afford a landline telephone connection were included in the sample. Therefore there was an under-representation of very low SES adults. This suggests that our findings are probably highly conservative. However, this does not invalidate our findings but rather suggests that the inequalities that we observed in this study may in reality be far larger than we have been able to enumerate here.

The VPHS data were collected in 2008. However, given the considerable challenges of collecting Aboriginal data in Victoria and that very little has changed for Aboriginal people in Australia since the instigation of the 'closing the gap' initiative in 2007–08, we believe this data is still relevant and important [51].

Conclusions

To summarise our key findings, we believe our work, despite the shortcomings previously discussed, goes beyond the dominant biomedical model, and demonstrates the importance of the social determinants in understanding the gap in the health of the Aboriginal compared with non-Aboriginal population. The majority of studies in the literature did not directly compare between Aboriginal and non-Aboriginal, a major strength of this work.

This is the first study of its kind in Victoria, and is suggestive of differences between Aboriginal people who reside in Victoria and Aboriginal people who reside in other states of Australia. This highlights the importance of remembering that Aboriginal people are a culturally and linguistically diverse population when interpreting the findings of the national data, as national data are likely to mask important differences.

To the best of our knowledge, this is the first population-based study in Australia that has directly measured the prevalence of depression and anxiety in an Aboriginal population. Previous studies have used psychological distress as a proxy for depression and anxiety [52].

Our findings have important implications for, and should inform, service planning and the development of evidence-based policy and interventions: namely that we need to focus on the social determinants of health that are most relevant to Aboriginal health and rethink our dependence on the biomedical model of health.

Abbreviations

VPHS: Victorian population health survey; PR: Prevalence ratio; SES: Socioeconomic status; LGA: Local government area; BMI: Body mass index; WHO: World Health Organization; NHMRC: National health and medical research council.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

AM designed the research; AM, Z.A, MS and LP conducted the research; AM analysed the data; AM, ZA, M.S, LP and JM wrote the paper; AM had primary responsibility for the final content. All authors read and approved the final manuscript.

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References

- World Health Organization: *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health*, Final report of the Commission on Social determinants of Health. Geneva: World Health Organization; 2008.
- Australian Institute of Health and Welfare (AIHW): *Life Expectancy and Mortality of Aboriginal and Torres Strait Islander people*. Cat. no. IHW 51. Canberra: AIHW; 2011.
- Vos T, Barker B, Stanley L, Lopez AD: *The Burden of Disease and Injury in Aboriginal and Torres Strait Islander peoples 2003*. Brisbane: School of Population Health, The University of Queensland; 2007.
- Awofeso N: **Racism: a major impediment to optimal Indigenous health and health care in Australia**. *Australian Indigenous Health Bull* 2011, **11**:1–13.
- Purdie N, Dudgeon P, Walker R: *Working Together: Aboriginal and Torres Strait Islander Mental Health and Wellbeing Principles and Practice*. Canberra: Department of Health and Ageing; 2010.
- Social determinants and the health of indigenous peoples in Australia - a human rights based approach**. <https://www.humanrights.gov.au/news/speeches/social-determinants-and-health-indigenous-peoples-australia-human-rights-based>.
- Bond CJ: **A culture of ill health: public health or aboriginality?** *Med J Aust* 2005, **183**:39–41.
- Pyett P, Waples C: **Challenging our own practices in indigenous health promotion and research**. *Health Promot J Austr* 2008, **19**:179–183. %U <http://search.informit.com.au/documentSummary;dn=046048739783167;res=IELHEA>.
- Henry BR, Houston S, Mooney GH: **Institutional racism in Australian healthcare: a plea for decency**. *Med J Aust* 2004, **180**:517–520.
- Australian Bureau of Statistics (ABS): **2076.0 - Census of population and housing: characteristics of Aboriginal and Torres Strait Islander Australians. first issue**. <http://www.abs.gov.au/ausstats/abs@nsf/mf/2076.0>.
- Markwick A, Haider S, Vaughan L, Ansari Z: *The Health and Wellbeing of Aboriginal Victorians. Victorian Population Health Survey 2008 supplementary report*. Melbourne: State Government of Victoria; 2011.
- Ansari Z, Carson NJ, Ackland MJ, Vaughan L, Serraglio A: **A public health model of the social determinants of health**. *Soz Praventivmed* 2003, **48**:242–251.
- National Health and Medical Research Council (NHMRC) values and ethics - guidelines for ethical conduct in Aboriginal and Torres Strait Islander Health Research. <https://www.nhmrc.gov.au/guidelines/publications/e52>.
- Stata statistical software: release 12. College Station, TX: StataCorp LP. <http://www.stata.com/>.
- Deddens JA, Petersen MR: **Approaches for estimating prevalence ratios**. *Occup Environ Med* 2008, **65**:481. 501–486.
- Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SL, Walters EE, Zaslavsky AM: **Short screening scales to monitor population prevalences and trends in non-specific psychological distress**. *Psychol Med* 2002, **32**:959–976.
- National Health and Medical Research Council (NHMRC): *Australian Alcohol Guidelines: Health Risks and Benefits*. Canberra: National Health and Medical Research Council (NHMRC); 2001. http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/ds9.pdf.
- World Health Organization (WHO): *Obesity, Preventing and Managing the Global Epidemic*, Report of a WHO consultation on obesity. Geneva: World Health Organization (WHO); 1997. http://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/.
- Department of Health and Aged Care (DHAC): *National Physical Activity Guidelines for Australians*. Canberra: DHAC; 1999. http://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/.
- National Health and Medical Research Council (NHMRC): *Dietary Guidelines for Australian Adults*. Canberra: National Health and Medical Research Council (NHMRC); 2003. http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/n33.pdf.
- Burstrom B, Fredlund P: **Self rated health: is it as good a predictor of subsequent mortality among adults in lower as well as in higher social classes?** *J Epidemiol Community Health* 2001, **55**:836–840.
- Ferdinand A, Paradies Y, Kelaheer M: *Mental Health Impacts of Racial Discrimination in Victorian Aboriginal Communities: The Localities Embracing and Accepting Diversity (LEAD) Experiences of Racism Survey*. Melbourne: The Lowitja Institute; 2012.
- Priest N, Paradies Y, Stewart P, Luke J: **Racism and health among urban Aboriginal young people**. *BMC Public Health* 2011, **11**:568.
- Priest NC, Paradies YC, Gunthorpe W, Cairney SJ, Sayers SM: **Racism as a determinant of social and emotional wellbeing for Aboriginal Australian youth**. *Med J Aust* 2011, **194**:546–550.
- Hamer M, Kivimaki M, Stamatakis E, Batty GD: **Psychological distress as a risk factor for death from cerebrovascular disease**. *CMAJ* 2012, **184**:1461–1466.
- Stansfeld SA, Fuhrer R, Shipley MJ, Marmot MG: **Psychological distress as a risk factor for coronary heart disease in the Whitehall II Study**. *Int J Epidemiol* 2002, **31**:248–255.
- Holden L, Scuffham P, Hilton M, Vecchio N, Whiteford H: **Psychological distress is associated with a range of high-priority health conditions affecting working Australians**. *Aust N Z J Public Health* 2010, **34**:304–310.
- King S, Moffitt A, Bellamy J, Carter S, McDowell C, Mollenhauer J: **When there's not enough to eat. A national study of food insecurity among emergency relief clients. State of the family report volume 2**. ANGLICARE Australia. http://www.anglicare.asn.au/site/sof12_notenoughtoat.php.
- Kondo N, Sembajwe G, Kawachi I, van Dam RM, Subramanian SV, Yamagata Z: **Income inequality, mortality, and self rated health: meta-analysis of multilevel studies**. *BMJ* 2009, **339**:b4471.
- Kawachi I, Adler NE, Dow WH: **Money, schooling, and health: mechanisms and causal evidence**. *Ann N Y Acad Sci* 2010, **1186**:56–68.
- Kawachi I, Subramanian SV, Kim D: **Social Capital and Health**. In *Social Capital and Health*. New York: Springer; 2008:1–26.

32. Bourdieu P: **The forms of capital.** In *Handbook of Theory and Research in the Sociology of Education*. Edited by Richardson J. New York: Greenwald Press; 1986:241–258.
33. Baum F: **Social capital.** In *Social Determinants of Indigenous Health*. Edited by Carson B, Dunbar T, Chenhall RD, Bailie R. Crows Nest, NSW: Allen and Unwin; 2007:109–130.
34. Mignone J: **Social capital and Aboriginal communities: a critical assessment synthesis and assessment of the body of knowledge on social capital with emphasis on Aboriginal communities.** *J Aborig Health* 2009, **5**:100–147.
35. Wood D, Halfon N, Scarlata D, Newacheck P, Nessim S: **Impact of family relocation on children's growth, development, school function, and behavior.** *JAMA* 1993, **270**:1334–1338.
36. Lin KC, Twisk JW, Huang HC: **Longitudinal impact of frequent geographic relocation from adolescence to adulthood on psychosocial stress and vital exhaustion at ages 32 and 42 years: the Amsterdam growth and health longitudinal study.** *J Epidemiol* 2012, **22**:469–476.
37. Perkins R, Langton M: *First Australians: An Illustrated History*. Carlton: Miegunyah Press; 2010.
38. Maru YT, Davies J: **Supporting cross-cultural brokers is essential for employment among Aboriginal people in remote Australia.** *Rangeland J* 2011, **33**:327–338.
39. Australian Bureau of Statistics: **4704.0 - the Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples.** 2010. <http://www.abs.gov.au/AUSSTATS/abs@.nsf/lookup/4704.0Chapter450Oct+2010>.
40. Paradies Y: **A systematic review of empirical research on self-reported racism and health.** *Int J Epidemiol* 2006, **35**:888–901.
41. The State Government of Victoria : *Victorian Population Health Survey 2008*. Melbourne, Victoria: Department of Health; 2010. <http://www.health.vic.gov.au/healthstatus/survey/vphs2008.htm>.
42. Coffin J: **Rising to the challenge in Aboriginal health by creating cultural security.** *Med J Aust* 2007, **31**:22–24.
43. Mathur S, Moon L, Leigh S: **Aboriginal and Torres Strait Islander people with coronary heart disease: further perspectives and on health status and treatment.** cardiovascular disease series no. 26. Cat. no. CVD 34, Australian Institute of Health and Welfare, Canberra. 2006. <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=6442454970>.
44. Hall SE, Bulsara CE, Bulsara MK, Leahy TG, Culbong MR, Hendrie D, Holman CD: **Treatment patterns for cancer in Western Australia: does being Indigenous make a difference?** *Med J Aust* 2004, **181**:191–194.
45. Armstrong D: **"Controversies in epidemiology", teaching causality in context at the University at Albany, School of Public Health.** *Scand J Public Health* 1999, **27**:81–84.
46. Begg SJ, Vos T, Barker B, Stanley L, Lopez AD: **Burden of disease and injury in Australia in the new millennium: measuring health loss from diseases, injuries and risk factors.** *Med J Aust* 2008, **188**:36–40.
47. Steptoe A: *Depression and Physical Illness*. Cambridge: Cambridge University press; 2006.
48. Blackman T, Harvey J, Lawrence M, Simon A: **Neighbourhood renewal and health: evidence from a local case study.** *Health Place* 2001, **7**:93–103.
49. Ebrahim S, Smith GD: **Systematic review of randomised controlled trials of multiple risk factor interventions for preventing coronary heart disease.** *BMJ* 1997, **314**:1666–1674.
50. Rothman KJ: *Epidemiology: An Introduction*. New York: Oxford University Press; 2002.
51. Commonwealth of Australia: **Closing the gap Prime Minister's report 2014.** http://www.dpmc.gov.au/publications/docs/closing_the_gap_2014.pdf.
52. Jorm AF, Bourchier SJ, Cvetkovski S, Stewart G: **Mental health of Indigenous Australians: a review of findings from community surveys.** *Med J Aust* 2012, **196**:118–121.

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CHAPTER 4: FOOD INSECURITY

This chapter includes a peer-reviewed paper that was published in BMC Public Health (attached at the end of the chapter).

Markwick, A., Ansari, Z., Sullivan, M., and McNeil, J. (2014). "Social determinants and lifestyle risk factors only partially explain the higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders in the Australian state of Victoria: a cross-sectional study." BMC Public Health **14**: 598–608.

4.1 Introduction

The previous chapter identified food insecurity as a social determinant of particular note. In addition to the impact that food insecurity has on nutritional intake and its strong association with obesity, food insecurity also has a range of social and emotional consequences, such as psychological distress, social exclusion, impaired learning, and loss of productivity (King et al. 2012).

4.2 Aims

The aims of this chapter were to:

1. Identify factors associated with food insecurity
2. Measure the strength of association between food insecurity and Aboriginal and Torres Strait Islander status
3. Determine if the factors associated with food insecurity explained the higher prevalence of food insecurity among Aboriginal and Torres Strait Islander adults compared with their non-Aboriginal and Torres Strait Islander counterparts.

4.3 Summary

Food insecurity was determined by asking the survey respondents the question: "In the last 12 months, were there any times that you ran out of food, and couldn't afford to buy more?"

In the 12 months prior to the survey, 20.3% (13.5–29.4%) of Aboriginal and Torres Strait Islander adults in Victoria experienced at least one occasion where they ran out of food and could not afford to buy more, compared to 5.4% (5.0–5.8%) of non-Aboriginal and Torres Strait Islander adults. Using logistic regression, the strength of the association was odds ratio (OR) = 4.5 (95% Confidence Interval (CI): 2.7–7.4).

The variables hypothesised a priori to be associated with food insecurity were age, gender, rurality, household income, smoking, alcohol consumption, obesity, social capital (measured by the ability to get help from family, friends or neighbours), and household composition.

Food insecurity was associated with younger age, females, low household income, smoking, obesity, lack of social support, households with a child, lone parent households, and household size, but not rurality or alcohol consumption.

A multivariable logistic regression model that included age, household income, smoking, obesity, and lack of social support reduced the OR to 2.8 (1.6-5.0). However, Aboriginal and Torres Strait Islanders adults were still almost three times likely to have experienced food insecurity than their non-Aboriginal and Torres Strait Islander counterparts.

4.4 Conclusions

While differences between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians in age structure, prevalence of smoking and obesity, household income, and lack of social support partially explained the higher prevalence of food insecurity in Aboriginal and Torres Strait Islander adults, food insecurity remains an important social determinant of Aboriginal and Torres Strait Islander health and wellbeing in Victoria.

Understanding and addressing the high prevalence of food insecurity among Aboriginal and Torres Strait Islander Victorians may be an opportunity to reduce the gap in health and wellbeing. However, further research is needed to identify the reason(s) for the substantially higher prevalence of food insecurity among Aboriginal and Torres Strait Islander adults who live in Victoria.

4.5 References

Kendall, A. and E. Kennedy (1998). "Position of the American Dietetic Association: domestic food and nutrition security." *Journal of the American Dietetic Association* **98**(3): 337-342.

King, S., A. Moffitt, J. Bellamy, S. Carter, C. McDowell and J. Mollenhauser (2012). "When there's not enough to eat. A national study of food insecurity among emergency relief clients." State of the family report volume 2. Sydney, Anglicare Australia.

4.6 Publication

RESEARCH ARTICLE

Open Access

Social determinants and lifestyle risk factors only partially explain the higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders in the Australian state of Victoria: a cross-sectional study

Alison Markwick^{1,3*}, Zahid Ansari^{1,3}, Mary Sullivan² and John McNeil³

Abstract

Background: The prevalence of food insecurity is substantially higher among Australians of Aboriginal or Torres Strait Islander descent. The purpose of this study is to explain the relationship between food insecurity and Aboriginal and Torres Islander status in the state of Victoria.

Methods: Data were obtained from the 2008 Victorian Population Health Survey; a cross-sectional landline computer-assisted telephone interview survey of 34,168 randomly selected Victorians aged 18 years and older; including 339 Aboriginal and Torres Strait Islanders. We categorised a respondent as food insecure, if in the previous 12 months, they reported having run out of food and not being able to afford to buy more. We used multivariable logistic regression to adjust for age, sex, socioeconomic status (household income), lifestyle risk factors (smoking, alcohol consumption and obesity), social support (ability to get help from family, friends or neighbours), household composition (lone parent status, household with a child, and household size), and geographic location (rurality).

Results: Aboriginal and Torres Strait Islanders (20.3%) were more likely than their non-Aboriginal and Torres Strait Islander counterparts (5.4%) to have experienced food insecurity; odds ratio (OR) = 4.5 (95% CI; 2.7-7.4). Controlling for age, SES, smoking, obesity and inability to get help from family or friends reduced the odds ratio by 38%; OR_{adjusted} = 2.8 (1.6-5.0).

Conclusions: Social determinants and lifestyle risk factors only partially explained the higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders in Victoria. Further research is needed to explain the disparity in food insecurity between the two populations in order to inform and guide corrective action.

Background

Food insecurity has been defined as the “*limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways*” [1].

The prevalence of food insecurity in developed countries ranges from 4 to 14% [2]. In Australia, a single item question; “In the last 12 months, were there any times that you ran out of food and couldn’t afford to buy more?” was first included in the 1995 *National Nutrition Survey* to estimate the prevalence of food insecurity [2]. Subsequently the question was incorporated into the National Health Survey program and the prevalence of food insecurity in Australia was reported to be approximately 5%; the unemployed, low income households, lone parents and young people being over-represented [3].

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The *National Aboriginal and Torres Strait Islander Health Survey* in 2004–05 found that the prevalence of food insecurity was higher (24%) among Australians of Aboriginal and Torres Strait Islander descent [4]. In the second most populous Australian state of Victoria, the substantially higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders, adjusted for age, was found to be 17.7% (crude prevalence = 20.3%) [5].

It is well established that Aboriginal and Torres Strait Islander Australians are notably more socially and economically disadvantaged than their non-Aboriginal and Torres Strait Islander counterparts [6]. There is some evidence, however, that the main cause of food insecurity among Aboriginal and Torres Strait Islanders who live in remote rural communities is food scarcity rather than economic constraint [7]. However, the state of Victoria does not have any remote rural communities. Therefore, we hypothesised that the substantial difference in prevalence of food insecurity between Aboriginal and Torres Strait Islanders and their non-Aboriginal and Torres Strait Islander counterparts in Victoria would primarily be explained by economic constraint [8].

The aim of this paper was to investigate the relationship between food insecurity and Aboriginal and Torres Strait Islander status in the state of Victoria. More specifically, this paper aims to: (1) identify factors associated with food insecurity in Victoria; (2) measure the strength of the association between Aboriginal and Torres Strait Islander status and food insecurity; and (3) describe the influence of other factors associated with food insecurity on the association between Aboriginal and Torres Strait Islander status and food insecurity.

Methods

Data source, sampling frame and procedures

Data were collected as part of the Victorian Population Health Survey (VPHS) in 2008; a cross-sectional state-wide survey conducted to provide information on the health and well-being of Victorians [5]. The survey was conducted by computer-assisted telephone interview, on a randomly selected representative sample of people aged 18 years and older, who resided in private dwellings in Victoria and had access to a landline telephone. The sampling frame was an electronic listing of Victorian telephone exchange prefixes and localities and random digit dialling was used to generate a sample of telephone numbers that formed the household sample. Only one person aged 18 years and older per household was selected for interview and that was the person with the most recent birthday.

Sample size

The survey sample was stratified by Local Government Area (LGA), of which there are 79 LGAs in the state of

Victoria, with a target sample of 426 interviews per LGA. The total sample achieved was 34,168 completed interviews, including 339 respondents of Aboriginal and/or Torres Strait Islander descent. The sample size was based on the following formula assuming a prevalence of 7.5 per cent for a variable of interest, with a confidence interval of 2.5 per cent [i.e. 7.5 (5.0, 10.0) per cent]:

Sample size $(n) = Z^2 * p * (1 - p) / c^2 = 426$, where p = proportion (0.075), $Z = 1.96$ [Z-score of level of significance ($\alpha = 0.05$)], c = confidence interval (0.025) [9].

Response rate

The response rate, defined as the proportion of households where contact was made and an interview completed, was 64.9%.

Ethics statement

The Department of Health Human Research Ethics Committee approved the survey in accordance with the guidelines of the Declaration of Helsinki.

Variables

Food insecurity status was the outcome variable. Independent variables that were hypothesized a priori to be associated with food insecurity included; age, sex, socioeconomic status (total annual household income), lifestyle risk factors (smoking, excessive alcohol consumption and obesity), social support (inability to get help from family, neighbours or friends), household composition (lone parenthood, household with a child and household size), and geographic location (rurality).

A respondent was judged to be food insecure if they responded in the affirmative to the question: "In the last 12 months, were there any times that you ran out of food, and couldn't afford to buy more?"

Aboriginal and Torres Strait Islander status was determined by asking the question "Are you of Aboriginal or Torres Strait Islander origin?" Respondents who stated that they were Aboriginal ($n = 258$), Torres Strait Islander ($n = 40$) or both ($n = 41$) were combined and a binary variable created.

Socioeconomic status (SES) was measured by total annual household income which included income before tax from all sources such as social security payments, child support, and investments over the previous 12 months.

Survey respondents were asked about the lifestyle risk factors of smoking, excessive alcohol consumption and obesity. Excessive alcohol consumption was determined by comparing the respondent's pattern of alcohol consumption with the 2001 Australian recommended guidelines [10]. Those that exceeded the level of consumption considered to be safe were considered to be risky drinkers. Obesity was defined as a body mass index (BMI) of 30 kg/m² or

greater according to the recommendations of the World Health Organization; calculated from self-reported height and weight.

Social support was assessed by asking the respondent whether they could get help from family, neighbours or friends when needed.

Rurality was defined as being resident outside the metropolitan area of Melbourne within the state of Victoria.

Coding of variables

All independent variables, with the exception of household income, age and household size, were binary and the code 0 represented the referent group. Aboriginal and Torres Strait Islander status, smoking, excessive alcohol consumption, obesity, lone parenthood and households with a child were coded as 0 = no, 1 = yes. Sex was coded as 0 = male, 1 = female. The ability to get help from family, friends or neighbours was coded as 0 = yes, 1 = no. Rurality was coded as 0 = metropolitan, 1 = rural. Income and age were categorical with the highest income and oldest age category as the referent groups. Household size was a continuous variable.

Missing data

Less than 1% of respondents refused to answer or were unable to answer the survey questions for all variables; with the exception of total annual household income (18%), self-reported height and weight (6%) and the ability to get help from neighbours (3%). Missing data was excluded from the analysis. The models were rerun with the missing data included, but this made negligible difference to the findings.

Weighting

In order to control for participation bias, the survey data were weighted to reflect the age/sex/geographic distribution of the estimated resident population of Victoria and the probability of selection of the household and respondent within the household. The data were not weighted for ethnicity as this was not part of the original study design, which was to provide prevalence estimates for the whole population by LGA.

Statistical analysis

We analysed the survey data using the Stata statistical software package version 12 [11]. Initially we used univariable logistic regression to identify factors that were associated with food insecurity. Then we used multivariable logistic regression to investigate the relationship between food insecurity and Aboriginal and Torres Strait Islander status adjusting for all other factors that were associated with food insecurity. The outcome variable was whether or not a person reported at least one episode of food insecurity in the previous 12 months. The

independent variable of interest was Aboriginal and Torres Strait Islander status with non-Aboriginal and Torres Strait Islanders as the referent group. Statistical significance was determined at the $p < 0.05$ level. Statistical reliability was assessed by calculating relative standard errors (RSEs) for all prevalence estimates and RSEs of less than 25% were deemed to indicate an acceptable level of reliability. Variables that were not statistically significant in the univariable logistic regression analyses were not included in the multivariable logistic regression analyses. We tested for interaction by fitting interaction terms between the main variable of interest (Aboriginal or Torres Strait Islander status) and all factors that were found to be statistically significantly associated with food insecurity. We examined the adequacy of the final model in which all factors that were associated with food insecurity were included, using the Hosmer-Lemeshow goodness-of-fit test developed specifically for complex survey data [12].

Results

Table 1 shows the demographic characteristics of the Victorian population by Aboriginal and Torres Strait Islander status. Overall, the Aboriginal and Torres Strait Islander population was younger with a greater proportion residing in rural Victoria, compared with the non-Aboriginal and Torres Strait Islander population.

The crude prevalence of food insecurity in Victoria (Table 2) was substantially higher among Aboriginal and Torres Strait Islanders (20.3%), compared with their non-Aboriginal and Torres Strait Islander counterparts (5.4%).

Table 2 shows the results of the univariable logistic regression analysis that sought to identify factors that were associated with food insecurity. Excessive alcohol consumption and geographic location (rurality) were not associated with food insecurity. The remaining variables all showed associations with food insecurity.

Adult Victorians of Aboriginal and Torres Strait Islander descent were more than four times more likely to have experienced at least one episode of food insecurity compared with their non-Aboriginal and Torres Strait Islander counterparts, odds ratio (OR) = 4.5 (95% confidence interval (CI); 2.7-7.4).

Food insecurity was more likely to be experienced by females than males (OR = 1.4; 1.2-1.7). Age was associated with food insecurity with persons aged 18-24 years (OR = 3.4; 2.5-4.6), 25-34 years (OR = 3.7; 2.8-4.9), 35-44 years (OR = 3.0; 2.4-3.9), and 45-54 years (OR = 2.4; 1.9-3.1) being more likely to have experienced food insecurity compared with those aged 65 years and older, while those aged 55-64 years were no different to those aged 65 years and older (OR = 1.2; 0.9-1.6).

Table 1 Demographic characteristics of Victoria, by Aboriginal and Torres Strait Islander status

Demographic characteristic	ATSI *		Non-ATSI *	
	n **	Weighted% (95% CI)	n **	Weighted% (95% CI)
Males	120	51.4 (42.6–60.1)	12,830	48.9 (48.0–49.8)
Females	219	48.6 (39.9–57.4)	20,909	51.1 (50.2–52.0)
18-34 years	84	43.5 (34.6–52.9)	4,710	31.2 (30.3–32.1)
35-64 years	195	45.1 (36.6–53.9)	19,550	51.3 (50.4–52.2)
65 years and older	60	11.3 (7.7–16.4)	9,479	17.5 (17.0–18.0)
Resident in metropolitan Victoria	96	64.8 (57.0–71.9)	13,474	73.8 (73.4–74.2)
Resident in rural Victoria	243	35.2 (28.1–43.0)	20,265	26.2 (25.8–26.6)

ATSI * = Aboriginal and Torres Strait Islander.

**Unweighted sample.

95% CI = 95 per cent confidence interval.

Metropolitan Victoria consists of the City of Melbourne and its environs.

SES, measured by total annual household income, was strongly associated with food insecurity. For every decrease in income bracket, food insecurity increased by 70% ($OR_{trend} = 1.7$; 1.6-1.8).

Of the lifestyle risk factors evaluated, only smoking ($OR = 3.5$; 3.0-4.1) and obesity ($OR = 1.6$; 1.4-2.0) were associated with food insecurity.

All three indicators of social support (inability to get help from family or neighbours or friends) were associated with food insecurity; friends ($OR = 3.6$; 3.0-4.4), family ($OR = 3.5$; 2.8-4.3) and neighbours ($OR = 2.5$; 2.1-3.0).

All three indicators of household composition were associated with food insecurity; being a lone parent ($OR = 4.0$; 3.3-4.9), households with dependent children ($OR = 1.5$; 1.3-1.8), and household size ($OR = 1.1$; 1.1-1.2).

Table 3 summarises the relationship of food insecurity to Aboriginal and Torres Strait Islander status after adjustment for other factors associated with food insecurity.

Controlling for sex had no impact on the crude OR. By contrast, the adjusted OR (OR_{adj}) when age was taken into account was 4.0 (2.5-6.6), representing an 11.1% reduction of the crude OR.

Controlling for SES (total annual household income) reduced the crude OR by 13.3% ($OR_{adj} = 3.9$; 2.3-6.6).

Of the two lifestyle variables, controlling for smoking status reduced the crude OR by 15.6% ($OR_{adj} = 3.8$; 2.3-6.3). By contrast, controlling for obesity increased the crude OR by 8.9% ($OR_{adj} = 4.9$; 2.9-8.3).

Of the three social support variables, controlling for the inability to get help from neighbours had no impact on the crude OR. By contrast, controlling for being unable to get help from family reduced the crude OR by 8.9% ($OR_{adj} = 4.1$; 2.5-6.9) and controlling for being unable to get help from friends increased the crude OR by 6.7% ($OR_{adj} = 4.8$, 2.9-7.9).

Of the three household composition variables, controlling for being a lone parent household, households

with a child or household size had no impact on the crude OR.

Subsequently, we fitted various multivariable models to examine the relative impacts of each of the domains of the factors that were associated with food insecurity. Age and sex, SES and lifestyle risk factors were the only domains that appeared to make a substantial impact as measured by a change in the crude OR. However, when the individual factors were examined, the impact of sex and obesity was small if present at all, while the impact of the inability to get help from friends appeared to cancel the impact on the inability to get help from family because their effects were in opposite directions.

We ran a multivariable model that included only the variables that changed the crude OR by 5% or more: age, smoking status, obesity, inability to get help from family and/or friends. This reduced the association of food insecurity and Aboriginal and Torres Strait Islander status by approximately 38% from $OR = 4.5$ (2.7-7.4) to $OR_{adj} = 2.8$ (1.6-5.0). The model provided a good fit to the data, by the *F*-adjusted mean residual goodness-of-fit test: $F(9,26972) = 1.28$, $prob > F = 0.2413$. When we included all the other factors that were associated with food insecurity, irrespective of whether they impacted on the crude OR, we obtained similar results.

All first order interaction terms with the primary explanatory variable were not statistically significant and therefore not included in the model.

Discussion

We investigated the relationship between food insecurity and Aboriginal and Torres Strait Islander status and show that Aboriginal and Torres Strait Islanders in Victoria were markedly more likely to have experienced food insecurity than their non-Aboriginal and Torres Strait Islander counterparts. Age, household income, smoking, obesity, and the inability to get help from family and/or friends only partially explained the higher

Table 2 Prevalence of social determinants and lifestyle risk factors by food insecurity status

Independent variable	Food secure		Food insecure		Univariable analysis	
	N ^b	Weighted% (95% CI)	N ^b	Weighted% (95% CI)	Crude OR (95% CI)	p value
ATSI^d status						
No	31,820	94.6 (94.2-95.0)	1,871	5.4 (5.0-5.8)	1.00	
Yes	280	82.3 (75.2-87.7)	59	20.3 (13.5-29.4)	4.5 (2.7-7.4)	<0.001
Age^c and sex						
65+ years	9,355	97.7 (97.2-98.1)	201	2.3 (1.9-2.8)	1.00	
55-64 years	6,967	97.2 (96.7-97.6)	312	2.8 (2.4-3.3)	1.2 (0.9-1.6)	0.15
45-54 years	6,190	94.6 (93.7-95.3)	481	5.4 (4.7-6.3)	2.4 (1.9-3.1)	<0.001
35-44 years	5,320	93.3 (92.4-94.1)	485	6.7 (5.9-7.6)	3.0 (2.4-3.9)	<0.001
25-34 years	2,902	91.9 (90.4-93.2)	314	8.1 (6.8-9.6)	3.7 (2.8-4.9)	<0.001
18-24 years	1,436	92.5 (90.7-94.0)	149	7.5 (6.0-9.3)	3.4 (2.5-4.6)	<0.001
Male	12,416	95.4 (94.7-96.0)	551	4.6 (4.0-5.3)	1.00	
Female	19,754	93.6 (93.0-94.1)	1,391	6.4 (5.9-7.0)	1.4 (1.2-1.7)	<0.001
Socioeconomic status^d						
Greater than \$80,000	6,711	98.1 (97.5-98.6)	100	1.9 (1.4-2.5)	1.00	
\$60,001 - \$80,000	3,692	96.8 (95.8-97.6)	103	3.2 (2.4-4.2)	1.7 (1.1-2.5)	0.01
\$40,001 - \$60,000	4,646	94.2 (92.9-95.3)	224	5.8 (4.7-7.1)	3.2 (2.2-4.5)	<0.001
\$20,001 - \$40,000	6,843	90.7 (89.4-92.0)	525	9.3 (8.0-10.6)	5.2 (3.8-7.3)	<0.001
\$20,000 or less	5,332	85.9 (84.2-87.5)	776	14.1 (12.5-15.8)	8.4 (6.1-11.6)	<0.001
Lifestyle risk factors						
Non or ex-smoker	26,918	96.1 (95.7-96.5)	1,079	3.9 (3.5-4.3)	1.00	
Smoker	5,119	87.6 (86.1-88.9)	856	12.4 (11.1-13.9)	3.5 (3.0-4.1)	<0.001
Risky drinker - no	19,426	94.7 (94.1-95.2)	1,124	5.3 (4.8-5.9)	1.00	
Risky drinker - yes	12,528	94.2 (93.5-94.9)	805	5.8 (5.1-6.5)	1.1 (0.9-1.3)	0.29
Not obese	24,131	95.1 (94.6-95.6)	1,246	4.9 (4.4-5.4)	1.00	
Obese	6,100	92.3 (91.1-93.3)	525	7.7 (6.7-8.9)	1.6 (1.4-2.0)	<0.001
Social support^e						
Family - yes	29,434	95.2 (94.8-95.6)	1,460	4.8 (4.4-5.2)	1.00	
Family - no	2,598	85.2 (82.8-87.4)	466	14.8 (12.6-17.2)	3.5 (2.8-4.3)	<0.001
Neighbours - yes	25,301	96.0 (95.5-96.3)	1,442	4.0 (3.7-4.5)	1.00	
Neighbours - no	5,899	90.4 (89.2-91.5)	731	9.6 (8.5-10.8)	2.5 (2.1-3.0)	<0.001
Friends - yes	30,522	95.0 (94.6-95.4)	1,625	5.0 (4.6-5.4)	1.00	

Table 2 Prevalence of social determinants and lifestyle risk factors by food insecurity status (Continued)

Friends - no	1,424	84.0 (81.3-86.4)	302	16.0 (13.6-18.7)	3.6 (3.0-4.5)	<0.001
Household composition						
Not a lone parent	30,618	95.0 (94.6-95.4)	1,581	5.0 (4.6-5.4)	1.00	
Lone parent	1,431	82.5 (79.7-84.9)	350	17.5 (15.1-20.3)	4.0 (3.3-4.9)	<0.001
Childless household	22,229	95.4 (94.8-95.8)	1,045	4.6 (4.2-5.2)	1.00	
Household with a child	9,851	93.1 (92.4-93.8)	890	6.9 (6.2-7.6)	1.5 (1.3-1.8)	<0.001
Household size ^f	32,170		1,942		1.1 (1.1-1.2)	<0.001
Geographic location						
Metropolitan	12,842	94.5 (93.9-95.0)	743	5.5 (5.0-6.1)	1.00	
Rural	19,328	94.5 (93.9-95.0)	1,199	5.5 (5.0-6.1)	1.0 (0.9-1.2)	0.99

95% CI = 95 per cent confidence interval, OR = odds ratio.

^aATSI = Aboriginal and Torres Strait Islander.

^bN = raw unweighted sample size; however, prevalence and prevalence odds ratio estimates are based on weighted data.

^cMean age = 45.7 years (45.6-45.8); min = 18 years, max = 99.

^dTotal annual household income.

^eAbility to get help from family, neighbours or friends, when needed.

^fContinuous variable.

Table 3 Relationship between food insecurity and Aboriginal or Torres Strait Islander status: adjusted for social determinants and lifestyle risk factors

Secondary independent variables	Adjusted Odds Ratio (95% CI)		
	Non-ATSI *	ATSI *	p value
Age and sex			
Age	1.0	4.0 (2.5-6.6)	<0.001
Sex	1.0	4.6 (2.8-7.5)	<0.001
Socioeconomic status (SES)^a	1.0	3.9 (2.3-6.6)	<0.001
Lifestyle risk factors^b			
Current smoker	1.0	3.8 (2.3-6.3)	<0.001
Obese	1.0	4.9 (2.9-8.2)	<0.001
Social support^c			
Unable to get help from family	1.0	4.1 (2.5-6.9)	<0.001
Unable to get help from friends	1.0	4.8 (2.9-7.9)	<0.001
Unable to get help from neighbours	1.0	4.5 (2.7-7.5)	<0.001
Household composition^d			
Lone parent household	1.0	4.6 (2.8-7.6)	<0.001
Household with a child	1.0	4.4 (2.7-7.2)	<0.001
Household size	1.0	4.6 (2.8-7.3)	<0.001
Multivariable models			
Age and SES ^a	1.0	3.0 (1.8-5.2)	<0.001
Age and lifestyle risk factors ^b	1.0	3.8 (2.3-6.4)	<0.001
Age and social support ^c	1.0	4.0 (2.4-6.6)	<0.001
Age, SES and lifestyle risk factors ^{c b}	1.0	2.9 (1.6-5.2)	<0.001
Age, SES and social support ^{a c}	1.0	2.9 (1.7-5.1)	<0.001
Age, SES, lifestyle & social support ^{a b c}	1.0	2.8 (1.6-5.0)	0.001
All significant predictor variables ^{d e}	1.0	2.9 (1.6-5.1)	<0.001

ATSI *= Aboriginal and Torres Strait Islander

Crude odds ratio was 4.5 (2.7-7.4).

^aTotal annual household income, ^bSmoking status and obesity, ^cInability to get help from family and/or friends, ^dAll variables shown by univariable analysis to be significantly ($p < 0.05$) associated with food insecurity.^eHosmer-Lemeshow goodness-of-fit test; $F(9, 26118) = 0.55$, $\text{prob} > F = 0.8359$. All interaction terms were insignificant. All p values were < 0.001 for the adjusted odds ratio.

prevalence of food insecurity among Aboriginal and Torres Strait Islanders.

Remote and rural communities may have problems accessing food due to geographical barriers; resulting in food scarcity, which has been identified as a major cause of food insecurity among Aboriginal and Torres Strait Islander populations in Australia [7]. Our finding that rurality (being resident in rural Victoria) was not associated with food insecurity supports our hypothesis that food scarcity is not a significant determinant of food insecurity in the state of Victoria, and highlights the importance of not assuming that the determinants of health and well-being among Aboriginal and Torres Strait Islanders are the same across the country.

The finding that younger age is associated with food insecurity, while older age appears to be protective is consistent with the literature [8]. This may reflect the

fact that Australia provides a modest safety net for the elderly that is often lacking for the younger age groups. Since the Aboriginal and Torres Strait Islander population is a much younger population, it is therefore to be expected that this would render Aboriginal and Torres Strait Islanders more vulnerable to food insecurity.

Total annual household income and smoking made the largest contributions to the relationship between food insecurity and Aboriginal and Torres Strait Islander status; reducing the OR by approximately 13% and 16%, respectively. Anglicare Australia, in their recent study of the clientele at emergency relief centres, concluded that insufficient income is the key determinant of food insecurity in Australia, as food is often the only discretionary item in a low-income household budget [8]. Our findings confirm the importance of income; as the lower the household income the higher the OR of food insecurity,

with those in the lowest household income bracket being 8.4 times more likely to have experienced food insecurity compared with those in the highest household income bracket. However, while household income is often used as a proxy of SES, it does not capture all aspects of SES [13]. SES is a multi-dimensional concept and other indicators of SES include: education, occupation, wealth, and area-based composite measures. These indicators are not necessarily interchangeable as they do not always correlate highly with each other; for example, the correlation between income and education has been reported to vary by ethnic group from 0.34 to 0.58, reflecting that income can vary at similar levels of education across different ethnic groups [14]. We selected household income as a measure of SES, based on our consideration of the most plausible causal pathway between the outcome variable of food insecurity and SES; since, income provides individuals and families with the necessary material resources and determines their purchasing power for accessing goods and services. However, it is possible that the difference in prevalence of food insecurity between Aboriginal and Torres Strait Islanders and their non-Aboriginal and Torres Strait Islander counterparts, after adjusting for household income, may still reflect unmeasured socioeconomic differences not captured by household income. Moreover, income as a measure of SES has been shown to be a more unstable measure than education or occupation with a higher non-response rate than other measures [15].

The prevalence of smoking has consistently been reported to be higher in the Aboriginal and Torres Strait Islander population [5]. Hypothetically, the high cost of tobacco products might be expected to put strain on low income households and to be in direct competition with other discretionary household items. However, adjusting for smoking status only reduced the OR by 15.6%; suggesting that smoking did not make a particularly large contribution to the higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders. Given that this is a cross-sectional study design, one cannot rule out the possibility of reverse causation where the stress of being subject to food insecurity causes people to smoke.

Excessive alcohol consumption was not associated and made no difference to our findings whether included or not. The wider societal belief that Aboriginal and Torres Strait Islanders are more likely to engage in excessive alcohol consumption has been the basis of negative stereotyping that has fuelled racist perceptions. This belief, however, is not supported by the evidence. Our data found that the proportion of adult Victorians who engaged in excessive alcohol consumption was no different between Aboriginal and Torres Strait Islanders compared with non-Aboriginal and Torres Strait Islanders

(43.9% vs. 45.5%). By contrast, Aboriginal and Torres Strait Islander men were more likely to abstain from alcohol consumption than their non-Aboriginal and Torres Strait Islander counterparts (22.4% vs. 12.4%, $p < 0.05$) [5]. These findings make an important contribution to dispelling ongoing negative stereotypes and combating racism, given that racism is a key determinant of Aboriginal and Torres Strait Islander health and well-being [16].

Aboriginal and Torres Strait Islanders in Victoria bore a higher burden of child removal from their families than any other state in Australia due to previous government assimilation policies [17]. It is possible that our finding that Aboriginal and Torres Strait Islander Victorians were less able to get help from family than their non-Aboriginal and Torres Strait Islander counterparts may be a reflection of the success of such past policies. Since family is usually the first point of contact in times of personal crisis, lacking family support means lacking an important resource that can effectively reduce an individual's vulnerability to negative life outcomes such as food insecurity. The assimilation policies of previous governments are now recognised as a form of institutional racism and exemplify how racism continues to be a key determinant of Aboriginal and Torres Strait Islander health and well-being, as their impacts continue to be experienced by the current generation [18].

Indigenous people in other comparable countries, such as Canada and New Zealand, have also been reported to experience a higher prevalence of food insecurity than their non-indigenous counterparts [19,20]. A study in Canada showed similar findings to our study; where, adjusting for SES reduced but did not eliminate the difference in prevalence [19]. This study used several indicators of SES including education, income, and home ownership; controlling for more aspects of SES than our study, yet still not able to fully account for the difference in prevalence of food insecurity between the indigenous and non-indigenous populations. The study employed a more comprehensive tool to measure food insecurity than we used in our study; the US Household Food Security Survey Module (HFSSM). They concluded however, that a shortcoming of the HFSSM was that it did not collect any information about the coping strategies of the food insecure and that it was therefore possible that differences in coping strategies may also have contributed to differences in the prevalence of food insecurity. Similarly, the VPHS only contained a single question pertaining to food insecurity and did not collect any information on coping strategies; such as, the use of food banks and the rationing of food. It is therefore possible that unmeasured differences in coping strategies may have contributed to the difference in the prevalence of food insecurity between Aboriginal and Torres Strait

Islanders and their non-Aboriginal and Torres Strait Islander counterparts; which would warrant investigation.

Strengths of the study

The VPHS is a population representative survey of the adult population of Victoria with a good response rate of 64.9% in 2008; comparable to that of the 2009 U.S National Health Interview Survey (65.4%).

The number of Aboriginal and Torres Strait Islanders recruited to the survey constituted 1% of the survey sample which was over-representative of the wider Victorian population (approximately 0.7%). Typically surveys tend to suffer from under-representation of the Aboriginal and Torres Strait Islander population due to reluctance to self-identify. One possible explanation for this is that the VPHS was not specifically aimed at the Victorian Aboriginal and Torres Strait Islander population and therefore respondents were not questioned about their Aboriginal or Torres Strait Islander status until the end of the survey, after the interviewer has established a rapport with the respondent, which may have been more conducive to identification.

Limitations of the study

Although Aboriginal and Torres Strait Islanders were over-represented in the 2008 VPHS, the absolute sample size was only 339. However, the sample size had a power of 80.5% to detect an OR of 1.8, $\alpha = 0.05$ (2-sided). Moreover, the RSEs for all prevalence estimates were less than 25% indicating a reasonable degree of statistical reliability.

We used a single question to measure food insecurity which fails to capture all facets of food insecurity. Therefore our estimate of the prevalence of food insecurity in Victoria is likely to be a very conservative estimate.

The data are self-reported and therefore factors such as smoking, excessive alcohol consumption and obesity may be under-reported. Moreover 18.3% of respondents refused or were unable to indicate their total annual household income; although this did not differ between Aboriginal and Torres Strait Islanders (14.8%; 9.6–22.1%) and non-Aboriginal and Torres Strait Islanders (18.3%; 17.6–19.0%). However, if this measurement error is randomly distributed across the study population (non-differential misclassification), it would be expected to drive the direction of the association between the outcome and primary exposure variable towards the null [21].

The data is cross-sectional and therefore causality and its direction cannot be inferred with such a study design.

While the response rate of the survey was 64.9%, a non-response analysis indicated a selection bias where males and people aged 18 to 34 years were under-represented [22]. This was corrected for by weighting the data by the sex, age and geographic distribution of

the state as well as the probability of being selected. However, since the survey was conducted using computer-assisted telephone interviewing, a further selection bias was introduced by virtue of the fact that only people who could afford a landline telephone connection were included in the sample. Therefore there was an under-representation of very low SES adults. This means that we are likely to have under-estimated the true prevalence of food insecurity in Victoria. However, such a systematic bias does not invalidate our findings but rather suggests that the prevalence of food insecurity may be larger than we have been able to enumerate here.

Conclusions

Food insecurity is a serious problem among Aboriginal and Torres Strait Islanders who reside in the Australian state of Victoria. Differences between Aboriginal and Torres Strait Islanders and their non-Aboriginal and Torres Strait Islander counterparts in age structure, SES (household income), prevalence of lifestyle risk factors and social support only partially explained the higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders. Further research is needed to identify the reason(s) for the substantially higher prevalence of food insecurity among Aboriginal and Torres Strait Islanders in Victoria.

To our knowledge this is the first study of its kind to investigate the determinants of food insecurity among Aboriginal and Torres Strait Islander in the state of Victoria using a population representative approach.

Information on the health and well-being of Aboriginal and Torres Strait Islanders in Australia most often comes from national datasets and is often dominated by studies with a focus on remote rural communities. This is mainly due to pragmatic considerations relating to sample size; Aboriginal and Torres Strait Islanders only constitute 2.5% of the Australian population with 73% residing in three states: New South Wales, Queensland and Western Australia [23]. Our work therefore highlights the importance of being reminded that while a small population in size, the Aboriginal and Torres Strait Islander population is a culturally and linguistically diverse population; geographic location is an important determinant of that diversity.

Our work contributes to the overall understanding of food insecurity in Australia, which, to date, has largely been based on treating ethnicity as a risk factor for food insecurity. We confirm that income insufficiency is indeed a key determinant of food insecurity. However, we also show that income insufficiency is not in itself sufficient to explain food insecurity among Aboriginal and Torres Strait Islanders.

Future research on food insecurity among Aboriginal and Torres Strait Islanders should be directed at investigating

all facets of food insecurity; including factors that influence the food supply, access to and utilisation of the food supply. Coping strategies for households at risk of food insecurity is another important area of focus; as is, understanding the role that institutional and other forms of racism (past and present) continues to play.

Competing interests

The authors certify that there are no competing interests, financial or otherwise, regarding the material discussed in this manuscript.

Authors' contribution

AM designed the research; AM, Z.A, and MS conducted the research; AM analysed the data; AM, ZA, M.S, and JM wrote the paper; AM had primary responsibility for the final content. All authors read and approved the final manuscript.

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References

- Kendall A, Kennedy E: Position of the American Dietetic Association: domestic food and nutrition security. *J Am Diet Assoc* 1998, **98**(3):337–342.
- Booth S, Smith A: Food security and poverty in Australia - challenges for dietitians. *Aust J Nutr Diet* 2001, **58**(3):150–156.
- Temple J: Severe and moderate forms of food insecurity in Australia: are they distinguishable? *Aust J Soc Issues* 2008, **43**:649–668.
- Acting on food insecurity in urban Aboriginal and Torres Strait Islander communities: policy and practice interventions to improve local access and supply of nutritious food. <http://www.healthinfonet.edu.edu.au/health-risks/nutrition/reviews/other-reviews>.
- The health and well-being of aboriginal Victorians: Victorian population health survey 2008 supplementary report. <http://www.health.vic.gov.au/healthstatus/survey/vphs-aboriginal.htm>.
- Population characteristics, Aboriginal and Torres Strait Islander Australians, 47130 reissue. <http://www.abs.gov.au/ausstats/abs@nsf/mf/47130>.
- Scelza BA: Food scarcity, not economic constraint limits consumption in a rural Aboriginal community. *Aust J Rural Health* 2012, **20**(3):108–112.
- King S, Moffitt A, Bellamy J, Carter S, McDowell C, Mollenhauer J: When there's not enough to eat. A national study of food insecurity among emergency relief clients. State of the family report volume 2. *Anglicare Australia* 2012, http://www.anglicare.asn.au/site/sof12_notenoughtoeat.php.
- National Statistical Service: <http://www.nss.gov.au/nss/home.NSF/pages/Sample+size+calculator>.
- National Health and Medical Research Council: *Australian Alcohol Guidelines: Health Risks and Benefits*. Canberra: NHMRC; 2001.
- Stata Statistical Software: Release 12. College Station, TX: StataCorp LP. <http://www.stata.com/>.
- Archer KJ, Lemeshow S, Hosmer DW: Goodness-of-fit tests for logistic regression models when data are collected using a complex sampling design. *Comput Stat Data An* 2007, **51**:4450–4464.

- Braveman PA, Cubbin C, Egerter S, Chideya S, Marchi KS, Metzler M, Posner S: Socioeconomic status in health research: one size does not fit all. *JAMA* 2005, **294**(22):2879–2888.
- Braveman P, Cubbin C, Marchi K, Egerter S, Chavez G: Measuring socioeconomic status/position in studies of racial/ethnic disparities: maternal and infant health. *Public Health Rep* 2001, **116**(5):449–463.
- Shavers VL: Measurement of socioeconomic status in health disparities research. *J Natl Med Assoc* 2007, **99**(9):1013–1023.
- Paradies Y: A systematic review of empirical research on self-reported racism and health. *Int J Epidemiol* 2006, **35**(4):888–901.
- Perkins R, Langton M (Eds): *First Australians: An illustrated history*. Carlton: Miegunyah Press; 2010.
- Henry BR, Houston S, Mooney GH: Institutional racism in Australian healthcare: a plea for decency. *Med J Aust* 2004, **180**(10):517–520.
- Willows ND, Veugelers P, Raine K, Kuhle S: Prevalence and sociodemographic risk factors related to household food security in Aboriginal peoples in Canada. *Public Health Nutr* 2009, **12**(8):1150–1156.
- Carter KN, Lanumata T, Kruse K, Gorton D: What are the determinants of food insecurity in New Zealand and does this differ for males and females? *Aust N Z J Public Health* 2010, **34**(6):602–608.
- Rothman KJ: *Epidemiology: an introduction*. New York: Oxford University Press; 2002.
- 2009 National Health Interview Survey sample adult and sample child nonresponse bias analysis. http://www.cdc.gov/nchs/data/nhis/nr_bias_analysis_report_2009_NHIS.pdf.
- Census of population and housing: characteristics of Aboriginal and Torres Strait Islander Australians, 2011. <http://www.abs.gov.au/ausstats/abs@nsf/Lookup/2076.0main+features1102011>.

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CHAPTER 5: PSYCHOLOGICAL DISTRESS

This chapter includes a peer-reviewed paper that was published in *Social Science and Medicine* (attached at end of the chapter).

Markwick, A., Ansari, Z., Sullivan, M., and McNeil, J. (2015). "Social determinants and psychological distress among Aboriginal and Torres Strait Islanders in the Australian state of Victoria: a cross-sectional population-based study." *Social Science and Medicine* **128**: 178–87.

5.1 Introduction

The research presented in chapter 3 identified psychological distress as a social determinant of note. Based on the findings in chapter 3 and the international literature summarised in chapter 1, where it is reported that the WHO recognises psychological distress as a major social determinant of morbidity and mortality, it was decided that the social determinant of psychological distress would be further pursued. Psychological distress is the topic of this chapter.

Psychological distress is a well-documented and important risk factor for a number of diseases and conditions including fatigue, migraine, cardiovascular disease, chronic obstructive pulmonary disease, cerebrovascular disease, injury, obesity, depression and anxiety (Hamer et al. 2012) (Holden et al. 2010) (Stansfeld et al. 2002).

The purpose of this study was to explain the higher prevalence of psychological distress in Aboriginal and Torres Strait Islander Victorians adults compared with their non-Aboriginal and Torres Strait Islander counterparts. However, in the absence of data relating to specific life stressors, but with a dataset rich in socio-demographic and social capital data, the focus was on the potential role of socioeconomic status and social capital.

5.2 Aims

The aims of this chapter were to:

1. Determine if various socio-demographic characteristics and measures of social capital are associated with psychological distress
2. Investigate the individual impact of each socio-demographic characteristic and measure of social capital on the association between psychological distress and Aboriginal and Torres Strait Islander status
3. Determine if socioeconomic status and social capital explain, at least in part, the higher prevalence of psychological distress among Aboriginal and Torres Strait Islander adults compared with their non-Aboriginal and Torres Strait Islander

counterparts, after controlling for all non-socioeconomic socio-demographic characteristics.

5.3 Summary

Psychological distress was measured using the Kessler 10 Psychological Distress Scale (K10), which is a set of 10 questions designed to categorise the level of psychological distress over a four-week period. It has been validated as a screening tool for detecting affective disorders such as depression and anxiety, and is currently in use in general practice in Australia (Andrews and Slade 2001). However, while the Kessler 5 Psychological Distress Scale has been validated in an Aboriginal and Torres Strait Islander population, the Kessler 10 scale has not.

The variables hypothesised a priori to be associated with psychological distress were: the socio-demographic variables of age, gender, rurality, marital status, household composition, and household size; six measures of socioeconomic status (household income, employment status, education, home ownership, financial stress, and food insecurity); and ten measures of social capital (social contact, neighbourhood tenure, perceptions of neighbourhood, social support, and social and civic trust). All variables, except rurality, were found to be statistically associated with psychological distress using univariable logistic regression.

Aboriginal and Torres Strait Islander Victorians (24.5%; 95% confidence interval (CI): 17.5–33.2%) were more than twice as likely as their non-Aboriginal and Torres Strait Islander counterparts (11.3%; 10.7–11.8%) to have high or very high levels of psychological distress (OR = 2.6; 1.7–3.9).

A multivariable logistic regression model that included five measures of socioeconomic status (household income, employment status, education, financial stress, food insecurity), negative perception of the residential neighbourhood, lack of social support from family, social and civic distrust, controlled for all non-socioeconomic socio-demographic variables, reduced the OR by 41% to 1.5 (0.9–2.3). The statistically significant association between psychological distress and Aboriginal and Torres Strait Islander status at the $p=0.05$ level was also eliminated. The variable that made the largest contribution to reducing the OR was food insecurity, which reduced the OR by 26%.

5.4 Conclusions

Inequalities in socioeconomic status and social capital appear to largely explain the higher prevalence of psychological distress among Aboriginal and Torres Strait Islander compared with non-Aboriginal and Torres Strait Islander adults who live in Victoria.

Lack of trust in most people and not feeling valued by society are measures of bridging and linking social capital. Bridging social capital reflects the relationship between the Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander communities, while

linking social capital reflects the relationship between the Aboriginal and Torres Strait Islander community and the structures of power, such as the government (Mignone 2009).

Low levels of bridging and linking social capital have been reported in other Aboriginal and Torres Strait Islander populations across Australia and there is evidence that it reflects racism and discrimination that creates and reinforces socioeconomic disadvantage (Baum 2007).

Again the topic of racism and its relationship with many other social determinants became apparent and furthered interest in investigating racism as a social determinant of Aboriginal and Torres Strait Islander health and wellbeing. The next two chapters explore this, and chapter 8 expands on the relationship between racism, social capital and other social determinants.

Addressing the underlying inequalities in socioeconomic status and social capital may be one approach to addressing the inequality in psychological distress. However, if as the literature suggests, racism and discrimination of Aboriginal and Torres Strait Islander Victorians are a significant barrier to bridging and linking social capital, it is hard to see how bridging and linking social capital can be built without challenging the attitudes and beliefs of the non-Aboriginal and Torres Strait Islander population.

5.5 References

Andrews, G. and T. Slade (2001). "Interpreting scores on the Kessler Psychological Distress Scale (K10)." Australian and New Zealand Journal of Public Health **25**(6): 494-7.

Baum, F. (2007). Social capital. Social determinants of health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest, NSW, Allen and Unwin: 109-34.

Hamer, M., M. Kivimaki, E. Stamatakis and G. D. Batty (2012). "Psychological distress as a risk factor for death from cerebrovascular disease." Canadian Medical Association Journal **184**(13): 1461-6.

Holden, L., P. Scuffham, M. Hilton, N. Vecchio and H. Whiteford (2010). "Psychological distress is associated with a range of high-priority health conditions affecting working Australians." Australian and New Zealand Journal of Public Health **34**(3): 304-10.

Mignone, J. (2009). "Social capital and Aboriginal communities: A critical assessment synthesis and assessment of the body of knowledge on social capital with emphasis on Aboriginal communities." Journal of Aboriginal Health **5**(3): 100-47.

Stansfeld, S. A., R. Fuhrer, M. J. Shipley and M. G. Marmot (2002). "Psychological distress as a risk factor for coronary heart disease in the Whitehall II Study." International Journal of Epidemiology **31**(1): 248-55.

5.6 Publication



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Social determinants and psychological distress among Aboriginal and Torres Strait islander adults in the Australian state of Victoria: A cross-sectional population based study



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ABSTRACT

Aboriginal and Torres Strait Islander adults in the Australian state of Victoria have a higher prevalence of psychological distress than their non-Aboriginal and Torres Strait Islander counterparts. We sought to explain this inequality, focussing on the social determinants of health. We used population-based survey data from the 2008 Victorian Population Health Survey; a cross-sectional landline computer-assisted telephone survey of 34,168 randomly selected adults. We defined psychological distress as a score of 22 or more on the Kessler 10 Psychological Distress scale. We used logistic regression to identify socio-demographic characteristics and social capital indicators that were associated with psychological distress. We then created multivariable models to explore the association between psychological distress and Aboriginal and Torres Strait Islander status that incorporated all significant socioeconomic status (SES) and social capital variables, adjusting for all non-SES socio-demographic characteristics. Aboriginal and Torres Strait Islander Victorians (24.5%) were more than twice as likely than their non-Aboriginal and Torres Strait Islander counterparts (11.3%) to have psychological distress (odds ratio (OR) = 2.56, 95% confidence interval; 1.67–3.93). Controlling for SES, negative perceptions of the residential neighbourhood, lack of social support from family, social and civic distrust, and all non-SES socio-demographic variables (age, sex, marital status, household composition, and rurality), rendered the previously statistically significant inequality in the prevalence of psychological distress, between Aboriginal and Torres Strait Islander Victorians and their non-Aboriginal and Torres Strait Islander counterparts, insignificant at the $p = 0.05$ level (OR = 1.50; 0.97–2.32). Psychological distress is an important health risk factor for Aboriginal and Torres Strait Islander adults that has yet to be widely acknowledged and addressed. Addressing the underlying inequalities in SES and social capital may be the key to addressing the inequality in psychological distress.

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1. Background

Psychological distress is an important incident and/or secondary risk factor for a number of diseases and conditions including: fatigue, migraine, cardiovascular disease, chronic obstructive

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pulmonary disease, cerebrovascular disease, injury, obesity, and depression and anxiety (Andrews and Slade, 2001; Hamer et al., 2012; Holden et al., 2010; Stansfeld et al., 2002). Moreover, psychological distress is associated with a higher risk of mortality, even after adjusting for potential confounders such as socioeconomic status (SES) (Pratt, 2009). Psychological distress is also a significant risk factor for the lifestyle risk factors of smoking, excessive consumption of alcohol, and drug use (Holden et al., 2010). Therefore, the evidence shows that psychological distress impacts negatively on health both directly and indirectly.

Aboriginal and Torres Strait Islander Australians have consistently been shown to have a higher prevalence of psychological

distress than their non-Aboriginal and Torres Strait Islander counterparts; ranging from 50% to three times higher (Jorm et al., 2012). In the state of Victoria, the age-adjusted prevalence of psychological distress among Aboriginal and Torres Strait Islander adults was 22.0%, compared with 11.3% of non-Aboriginal and Torres Strait Islander adults (Markwick et al., 2011). The 2004–05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) collected additional data on the impact and cause of psychological distress. Over half of those with psychological distress reported not always being able to carry out their normal daily activities, one-third had consulted a health professional about their distress, and 41% reported that their distress had nothing to do with their physical health (Cunningham and Paradies, 2012).

It is important to remember that the Aboriginal and Torres Strait Islander population of Australia is not a homogeneous group, as there are significant linguistic, cultural and experiential differences, based on geographic location (Australian museum, 2014). For

example, the Northern Territory has the highest proportion of Aboriginal and Torres Strait Islander people (27%), many of whom live in remote communities. By contrast, the Aboriginal and Torres Strait Islander population of the state of Victoria constitutes less than 1% of the total state population, is more widely dispersed across the state, and there are no remote communities (Australian Bureau of Statistics, 2012). Yet the majority of studies of Aboriginal and Torres Strait Islander health and wellbeing were conducted in either remote or rural communities, or using the national datasets which masks regional differences (Biddle, 2014). It cannot be assumed that the health and the determinants of the health of Aboriginal and Torres Strait Islander peoples are the same across the country.

Life stressors have been shown to be causally related to psychological distress with the individual's psychological resources and resources in the social environment (social capital) mediating or moderating the impact of life stressors on psychological distress

Table 1
Psychological distress by socio-demographic characteristics in Victoria: Univariable analysis.

Socio-demographic characteristic	Psychological distress (K10 \geq 22) ^a		Univariable analysis	
	N ^b	Weighted % (95% CI)	Crude odds ratio (95% CI)	p value
Non-Aboriginal	3778	11.3 (10.7–11.8)	1.00	
Aboriginal	80	24.5 (17.5–33.2)	2.56 (1.67–3.93)	<0.001
18–24 years	244	14.3 (12.2–16.6)	1.00	
25–34 years	436	12.5 (11.0–14.1)	0.85 (0.68–1.08)	0.181
35–44 years	718	10.4 (9.4–11.5)	0.70 (0.56–0.87)	0.001
45–54 years	880	12.3 (11.2–13.5)	0.84 (0.68–1.04)	0.109
55–64 years	834	10.7 (9.7–11.8)	0.72 (0.58–0.89)	0.002
65 + years	766	9.0 (8.1–9.9)	0.59 (0.48–0.73)	<0.001
Male	1283	9.7 (8.9–10.6)	1.00	
Female	2595	13.0 (12.3–13.8)	1.39 (1.24–1.56)	<0.001
Married or living with a partner	2001	9.0 (8.5–9.6)	1.00	
Not married or living with a partner	1849	16.2 (15.0–17.4)	1.94 (1.74–2.17)	<0.001
Household without a child	2589	11.6 (10.9–12.3)	1.00	
Household with a child	1271	11.0 (10.1–11.9)	0.94 (0.84–1.05)	0.279
Not a lone parent of a child	3464	10.9 (10.4–11.5)	1.00	
Lone parent of a child	392	22.9 (20.0–26.2)	2.43 (2.02–2.93)	<0.001
Household size ^c	3878	–	1.00 (1.00–1.00)	0.001
One person household	973	14.3 (13.2–15.5)	1.00	
Two person household	1278	10.2 (9.5–11.1)	0.68 (0.60–0.78)	<0.001
Three person household	626	12.6 (11.4–13.9)	0.86 (0.74–1.01)	0.059
Four person household	553	10.1 (9.0–11.4)	0.68 (0.58–0.79)	<0.001
Five people or more in household	418	12.2 (10.6–13.9)	0.83 (0.69–1.00)	0.045
Resides in metropolitan Victoria	1619	11.5 (10.9–12.2)	1.00	
Resides in rural Victoria	2259	11.1 (10.3–12.0)	0.96 (0.87–1.07)	0.476
Socioeconomic status				
Household income^c	3333	–	1.39 (1.34–1.45)	<0.001
Greater than \$80,000	424	6.2 (5.4–7.1)	1.00	
\$60,001–\$80,000	319	9.6 (8.2–11.1)	1.60 (1.28–2.00)	<0.001
\$40,001–\$60,000	525	12.4 (11.0–14.0)	2.13 (1.74–2.61)	<0.001
\$20,001–\$40,000	967	15.0 (13.7–16.4)	2.66 (2.22–3.19)	<0.001
\$20,000 or less	1098	21.4 (19.5–23.4)	4.11 (3.41–4.95)	<0.001
Employed	1650	9.2 (8.5–9.9)	1.00	
Unemployed	235	23.6 (19.6–28.2)	3.06 (2.38–3.93)	<0.001
Not in labour force	1968	13.9 (13.0–14.8)	1.60 (1.43–1.78)	<0.001
Completed tertiary education	725	7.5 (6.8–8.4)	1.00	
Completed secondary education	539	11.0 (9.7–12.4)	1.52 (1.27–1.81)	<0.001
Completed TAFE ^d	901	12.8 (11.6–14.1)	1.79 (1.53–2.10)	<0.001
Completed primary education or less	1665	15.1 (14.0–16.2)	2.18 (1.89–2.50)	<0.001
Owned a home or mortgage	2820	10.3 (9.8–10.9)	1.00	
Rented a home	1022	15.5 (14.2–17.0)	1.59 (1.41–1.81)	<0.001
No financial stress	2603	9.2 (8.7–9.7)	1.00	
Financial stress	1144	27.0 (24.9–29.3)	3.66 (3.22–4.17)	<0.001
Food secure	3077	9.8 (9.3–10.4)	1.00	
Food insecure	792	38.6 (35.0–42.3)	5.76 (4.88–6.80)	<0.001

95% CI = 95% confidence interval.

^a K10 = Kessler 10 Psychological Distress Scale.

^b N = raw unweighted sample size; however, prevalence and prevalence odds ratio estimates are based on weighted data.

^c Continuous variable.

^d TAFE = Technical And Further Education; with or without completion of secondary education.

(Ensel and Lin, 1991). For example, a lack of adequate social support and connections has consistently been linked to depressive symptoms (Kawachi and Berkman, 2001). Aboriginal and Torres Strait Islander Australians are more likely than their non-Aboriginal and Torres Strait Islander counterparts to suffer major life stressors, such as the premature death of a family member, being a victim of crime, and racism at the personal, societal, and institutional level (Australian Institute of Health and Welfare, 2011; Ferdinand et al., 2012; Henry et al., 2004). Therefore, the higher prevalence of psychological distress among Aboriginal and Torres Strait Islander Australians may be explained by a greater frequency of life stressors and/or the unique nature of particular life stressors to this population, for example, being a victim of racism and discrimination. In addition, deficits in social capital may reduce the ability to cope with life stressors, resulting in a higher prevalence of psychological distress.

While there is no universally agreed definition of social capital, the 'social cohesion approach' defines social capital by its function: the trustworthiness of the social environment makes possible reciprocity exchanges, norms and sanctions (Bird et al., 2010).

Social capital is broken down into three types: bonding, bridging, and linking. In the context of Aboriginal and Torres Strait Islander communities, bonding social capital refers to relationships within the Aboriginal and Torres Strait Islander community, bridging social capital to relationships between the Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander communities, and linking social capital to relationships between the Aboriginal and Torres Strait Islander community and the formal institutions of power (Mignone, 2009). Of the few studies that have investigated social capital among Aboriginal and Torres Strait Islander people in Australia, the majority are qualitative and focussed on rural or remote Aboriginal and Torres Strait Islander communities. These studies reported high levels of bonding social capital but low levels of bridging and linking social capital (Brough et al., 2006; Browne-Yung et al., 2013; Thorpe et al., 2013). Although Berry (2009) and Biddle (2012) did not distinguish between the three types of social capital, they both showed that low levels of social capital were associated with psychological distress and sadness among Aboriginal and Torres Strait Islander people (Berry, 2009; Biddle, 2012).

Table 2
Psychological distress by social capital in Victoria: Univariable analysis.

Social capital	Psychological distress (K10 \geq 22) ^a		Univariable analysis	
	N ^b	Weighted % (95% CI)	Crude OR (95% CI)	p value
Social environment				
Social contact				
10 or more people	1383	8.7 (8.0–9.4)	1.00	
5 to 9 people	1113	12.4 (11.4–13.5)	1.49 (1.30–1.70)	<0.001
Less than 5 people	1370	16.5 (15.3–17.8)	2.08 (1.83–2.37)	<0.001
Neighbourhood tenure				
More than 10 years	1952	10.7 (10.0–11.5)	1.00	
6 to 10 years	763	11.3 (10.2–12.6)	1.06 (0.92–1.22)	0.430
1 to 5 years	834	11.5 (10.4–12.7)	1.08 (0.94–1.24)	0.262
Less than 1 year	316	15.4 (13.1–18.1)	1.52 (1.23–1.86)	<0.001
Perception of neighbourhood				
Average, good or very good	1964	9.3 (8.7–10.0)	1.00	
Poor for 1 of 6 characteristics	357	15.6 (13.4–18.2)	1.80 (1.48–2.20)	<0.001
Poor for 2 of 6 characteristics	215	19.0 (15.3–23.4)	2.29 (1.74–3.01)	<0.001
Poor for 3 of 6 characteristics	162	25.1 (19.8–31.2)	3.26 (2.39–4.46)	<0.001
Poor for 4 to 6 characteristics	203	28.1 (22.6–34.3)	3.80 (2.81–5.14)	<0.001
Social support				
Able to get help from family				
Unable to get help from family	731	24.0 (21.5–26.6)	2.71 (2.32–3.15)	<0.001
Able to get help from neighbours				
Unable to get help from neighbours	1334	18.5 (17.2–20.0)	2.32 (2.07–2.60)	<0.001
Able to get help from friends				
Unable to get help from friends	516	28.7 (25.4–32.2)	3.43 (2.87–4.10)	<0.001
Able to get help^c				
Unable to get help from 1 of 3 ^c	1102	15.4 (14.1–16.8)	2.00 (1.77–2.27)	<0.001
Unable to get help from 2 of 3 ^c	424	27.6 (24.2–31.3)	4.19 (3.46–5.07)	<0.001
Unable to get help from 3 of 3 ^c	192	39.0 (31.8–46.7)	7.02 (5.08–9.71)	<0.001
Social and civic trust				
Feel safe				
Don't feel safe	1306	17.8 (16.5–19.2)	2.03 (1.81–2.27)	<0.001
Trust most people				
Do not trust most people	1303	20.7 (19.1–22.3)	2.62 (2.33–2.95)	<0.001
Valued by society				
Not valued by society	1243	27.5 (25.4–29.7)	3.79 (3.35–4.30)	<0.001
Opportunities to have a say				
No opportunities to have a say	1444	17.8 (16.5–19.2)	2.09 (1.87–2.35)	<0.001
Positive for civic and social trust^d				
Negative for 1 of 4 ^d	930	11.2 (10.2–12.4)	1.82 (1.57–2.12)	<0.001
Negative for 2 of 4 ^d	779	20.2 (18.3–22.2)	3.64 (3.10–4.27)	<0.001
Negative for 3 of 4 ^d	456	30.6 (27.0–34.4)	6.35 (5.19–7.76)	<0.001
Negative for ALL ^d	211	42.2 (36.0–48.7)	10.53 (7.94–13.97)	<0.001

OR = odds ratio, 95% CI = 95% confidence interval.

^a K10 = Kessler 10 Psychological Distress Scale.

^b N = raw unweighted sample size; however, prevalence and prevalence odds ratio estimates are based on weighted data.

^c Composite variable; help from family, neighbours and/or friends.

^d Composite variable; feel safe, trust people, feel valued by society, and/or have opportunities to have a say.

SES is also strongly associated with psychological distress, where people of low SES consistently have higher levels of psychological distress compared with people of high SES (Phongsavan et al., 2006). Aboriginal and Torres Strait Islander people continue to be a severely socially and economically disadvantaged population in Australia. Therefore, it is possible that the higher prevalence of psychological distress reflects, at least in part, the lower SES of Aboriginal and Torres Strait Islander Australians.

The purpose of this study was to explain the higher prevalence of psychological distress among Aboriginal and Torres Strait Islander adults, compared with their non-Aboriginal and Torres Strait Islander counterparts, in the state of Victoria. However, in the absence of data relating to specific life stressors, but with a dataset rich in socio-demographic and social capital data, we decided to focus on the role of SES and social capital. We aimed to: (1) determine if various socio-demographic characteristics and measures of social capital were associated with psychological distress, (2) investigate the individual impact of each socio-demographic characteristic and measure of social capital on the association between psychological distress and Aboriginal and Torres Strait Islander status, and (3) determine if SES and social capital explained, at least in part, this association, after controlling for all non-SES socio-demographic characteristics.

For ease of reading, but not to take away from their distinct ethnic identities, we will use 'Aboriginal' to refer to both Aboriginal and Torres Strait Islander Victorians in the remainder of the paper.

2. Methods

2.1. Data source

Data were collected as part of the Victorian Population Health Survey (VPHS) in 2008; a cross-sectional, state-wide, landline computer-assisted telephone interview survey conducted to

provide information on the health and well-being of Victorians (Markwick et al., 2011).

2.2. Study design and sample size

The primary sampling unit was an individual aged 18 years and older who lived in a private dwelling, randomly selected across the state of Victoria using random digit dialling, and stratified by Local Government Area (LGA). The person in the household with the most recent birthday was selected for interview. The survey sample was stratified by Local Government Area (LGA), of which there are 79 in the state of Victoria, with a target sample size of 426 individuals per LGA. The total sample achieved was 34,168 completed interviews, including 339 Aboriginal respondents. The response rate, defined as the proportion of households where contact was made and an interview completed, was 65%.

2.3. Weighting

In order to control for participation bias, the survey data were weighted to reflect the age/sex/geographic distribution of the estimated resident population of Victoria and the probability of selection of the household and respondent within the household. The data were not weighted for ethnicity as this was not part of the original study design, which was to provide prevalence estimates for the whole population by LGA.

2.4. Ethics statement

The Department of Health Human Research Ethics Committee approved the survey in accordance with the guidelines of the Declaration of Helsinki.

Table 3

Individual impact of socio-demographic characteristics and social capital on the association between psychological distress and Aboriginal status: bivariation analysis.

Secondary independent variables	Adjusted odds ratio ^a (95% CI)			% change from crude OR
	Non-Aboriginal	Aboriginal	p value	
Socio-demographic characteristics	1.0	2.46 (1.61–3.77)	<0.001	4%
Age	1.0	2.48 (1.62–3.81)	<0.001	3%
Sex	1.0	2.59 (1.68–4.00)	<0.001	–1%
Unmarried or not living with a partner	1.0	2.45 (1.60–3.75)	<0.001	4%
Household with a child	1.0	2.58 (1.68–3.96)	<0.001	–1%
Lone parenthood	1.0	2.57 (1.67–3.95)	<0.001	0%
Household size	1.0	2.52 (1.64–3.86)	<0.001	2%
Geographic location (rurality)	1.0	2.57 (1.67–3.95)	<0.001	0%
Socioeconomic status (SES)	1.0	1.71 (1.15–2.56)	0.008	33%
Total annual household income	1.0	2.30 (1.52–3.47)	<0.001	10%
Employment status	1.0	2.41 (1.58–3.67)	<0.001	6%
Level of educational attainment	1.0	2.44 (1.60–3.73)	<0.001	5%
Lack of home ownership (wealth)	1.0	2.31 (1.51–3.52)	<0.001	10%
Financial stress	1.0	2.32 (1.48–3.65)	<0.001	9%
Food insecurity	1.0	1.90 (1.29–2.80)	0.001	26%
Social environment	1.0	2.26 (1.53–3.33)	<0.001	12%
Low social contact	1.0	2.54 (1.67–3.85)	<0.000	1%
Short neighbourhood tenure	1.0	2.44 (1.61–3.70)	<0.001	5%
Perception of neighbourhood as poor or very poor	1.0	2.38 (1.59–3.57)	<0.001	7%
Social support	1.0	2.50 (1.63–3.85)	<0.001	2%
Inability to get help from family	1.0	2.37 (1.51–3.71)	<0.001	7%
Inability to get help from neighbours	1.0	2.53 (1.66–3.85)	<0.001	1%
Inability to get help from friends	1.0	2.68 (1.74–4.14)	<0.001	–5%
Civic and social trust	1.0	2.23 (1.47–3.37)	<0.001	13%
Did not feel safe walking alone down street after dark	1.0	2.49 (1.60–3.86)	<0.001	3%
Did not agree most people can be trusted	1.0	2.40 (1.60–3.63)	<0.001	6%
Did not feel valued by society	1.0	2.40 (1.59–3.63)	<0.001	6%
Did not believe there are opportunities to have a say	1.0	2.44 (1.58–3.76)	<0.001	5%

95% CI = 95% confidence interval.

^a Crude odds ratio (OR) = 2.56 (1.67–3.93).

Table 4
Individual impact of socioeconomic status (SES) and social capital on the association between psychological distress and Aboriginal status, after controlling for non-SES socio-demographic characteristics^a: multivariable analysis.

Secondary independent variables	Adjusted odds ratio ^b (95% CI)			% change from crude OR
	Non-Aboriginal	Aboriginal	p value	
Socioeconomic status (SES)	1.0	1.68 (1.13–2.51)	0.010	34%
Total annual household income	1.0	2.12 (1.40–3.20)	<0.001	17%
Employment status	1.0	2.26 (1.50–3.41)	<0.001	12%
Level of educational attainment	1.0	2.27 (1.50–3.44)	<0.001	11%
Lack of home ownership (wealth)	1.0	2.32 (1.52–3.53)	<0.001	9%
Financial stress	1.0	2.25 (1.43–3.56)	<0.001	12%
Food insecurity	1.0	1.90 (1.29–2.82)	0.001	26%
Social environment	1.0	2.19 (1.48–3.26)	<0.001	14%
Low social contact	1.0	2.40 (1.58–3.64)	<0.000	6%
Short neighbourhood tenure	1.0	2.39 (1.58–3.61)	<0.001	7%
Perception of neighbourhood as poor or very poor	1.0	2.31 (1.54–3.46)	<0.001	10%
Social support	1.0	2.45 (1.59–3.77)	<0.001	4%
Inability to get help from family	1.0	2.31 (1.49–3.6)	<0.001	10%
Inability to get help from neighbours	1.0	2.47 (1.62–3.76)	<0.001	3%
Inability to get help from friends	1.0	2.57 (1.66–3.96)	<0.001	0%
Civic and social trust	1.0	2.12 (1.41–3.21)	<0.001	17%
Did not feel safe walking alone down street after dark	1.0	2.34 (1.52–3.61)	<0.001	8%
Did not agree most people can be trusted	1.0	2.31 (1.55–3.46)	<0.001	10%
Did not feel valued by society	1.0	2.31 (1.53–3.49)	<0.001	10%
Did not believe there are opportunities to have a say	1.0	2.36 (1.54–3.62)	<0.001	8%

95% CI = 95 per cent confidence interval.

^a The non-SES socio-demographic characteristics controlled for included age, sex, marital status, presence of a child in the household, household size, lone parenthood, and geographic location (rurality).

^b Crude odds ratio (OR) = 2.56 (1.67–3.93).

2.5. Variables

Psychological distress was the outcome variable and was measured using the Kessler 10 Psychological Distress Scale (K10), that has been validated against the Australian population (Andrews and Slade, 2001). The K10 consists of 10 questions that are summed to yield scores ranging from 10 to 50. We defined psychological

distress as a K10 score of 22 or more. The reference group consisted of those who scored less than 22.

Aboriginal status was the primary independent variable of interest, and was determined by asking the question “Are you of Aboriginal or Torres Strait Islander origin?” Respondents who stated that they were Aboriginal (n = 258), Torres Strait Islander (n = 40) or both (n = 41) were combined. Non-indigenous

Table 5
Impact of socioeconomic status (SES) and social capital on the association between psychological distress and Aboriginal status, controlled for non-SES socio-demographic characteristics: final multivariable models.

Multivariable model ^a	Adjusted odds ratio ^b (95% CI)			Social determinants in model
	Non-Aboriginal	Aboriginal	p value	
(1) Variables that changed crude OR by 7% or more ^c	1.0	1.50 (0.97–2.33)	0.070	Six SES variables, neighbourhood tenure, perception of neighbourhood, inability to get help from family, and all four social and civic trust variables.
(2) Variables that changed crude OR by 8% or more ^d	1.0	1.52 (0.98–2.34)	0.062	Six SES variables, perception of neighbourhood, inability to get help from family, and all four social and civic trust variables.
(3) Variables that changed crude OR by 9% or more ^e	1.0	1.53 (0.99–2.35)	0.055	Six SES variables, perception of neighbourhood, inability to get help from family, and one social trust ^f and one civic trust variable ^f .
(4) Variables that changed crude OR by 10% or more ^g	1.0	1.50 (0.97–2.32)	0.066	Five of six SES variables ^h , perception of neighbourhood, inability to get help from family, and one social trust ^f and one civic trust variable ^f .
(5) Variables that changed crude OR by 11% or more ⁱ	1.0	1.66 (1.11–2.47)	0.013	Five of six SES variables ^h .
(6) Variables that changed crude OR by 12% or more ^j	1.0	1.70 (1.14–2.54)	0.010	Four of six SES variables ^k .

OR = odds ratio, 95% CI = 95 per cent confidence interval.

^a Every model was adjusted for all non-SES socio-demographic characteristics: age, sex, marital status, household with a child, household size, lone parenthood, and rurality.

^b Crude OR = 2.56 (1.67–3.93).

^c Hosmer–Lemeshow goodness-of-fit test = $F(9,34082) = 0.83$, $p = 0.59$; $\chi^2_{LR}(4) = 6.43$, $p = 0.17$; area under ROC curve = 0.75.

^d Hosmer–Lemeshow goodness-of-fit test = $F(9,34082) = 0.84$, $p = 0.58$; $\chi^2_{LR}(4) = 123.5$, $p < 0.001$; area under ROC curve = 0.75.

^e Hosmer–Lemeshow goodness-of-fit test = $F(9,34082) = 0.97$, $p = 0.46$; $\chi^2_{LR}(2) = 1.44$, $p = 0.49$; area under ROC curve = 0.75.

^f Included distrust of most people and not feeling valued by society.

^g Hosmer–Lemeshow goodness-of-fit test = $F(9,34082) = 1.05$, $p = 0.40$; $\chi^2_{LR}(11) = 847.2$, $p < 0.001$; area under ROC curve = 0.75.

^h Included household income, employment status, education, financial stress and food insecurity.

ⁱ Hosmer–Lemeshow goodness-of-fit test = $F(9,34082) = 0.92$, $p = 0.50$; $\chi^2_{LR}(13) = 848.7$, $p < 0.001$; area under ROC curve = 0.71.

^j Hosmer–Lemeshow goodness-of-fit test = $F(9,34082) = 1.20$, $p = 0.29$; $\chi^2_{LR}(4) = 68.2$, $p < 0.001$; area under ROC curve = 0.71.

^k Included household income, employment status, financial stress and food insecurity.

Victorians constituted the reference group.

2.6. Socio-demographic variables

The socio-demographic variables that we investigated (Table 1) included: age, sex, marital status, household composition (presence of a child in a household, lone parenthood, and household size), geographic location (rural Victoria or metropolitan Melbourne), and six indicators of SES (total annual household income, employment status, education, home ownership, financial stress, and food insecurity). Total annual household income included income before tax from all sources such as social security payments, child support, and investments over the previous 12 months. We defined financial stress as being unable to raise \$2000 within 2 days in an emergency, and food insecurity as a response in the affirmative to the question: “In the last 12 months, were there any times that you ran out of food, and couldn't afford to buy more?”

2.7. Social capital

We measured three domains of social capital (Table 2): (1) the social environment (social contact, neighbourhood tenure, and perception of the residential neighbourhood); (2) social support (ability to get help from family, neighbours and friends); and (3) social and civic trust.

We measured social contact by asking how many people the respondent had spoken with on the previous day, neighbourhood tenure by asking how long the respondent had lived in their neighbourhood, and perception of the residential neighbourhood by asking a series of six questions, creating a composite variable based on the number of negative answers. The six questions were “How would you rate the area in which you live for (1) easy access to recreational and leisure facilities such as parks, bike tracks and recreational areas? (2) good facilities and services such as shops, childcare, schools and libraries, (3) opportunities to volunteer in local groups, (4) a wide range of community and support groups, (5) being an active community where people do things and get involved in local issues and activities, and (6) being a pleasant environment with nice streets, well planned, and open spaces?”

We assessed social trust by asking two questions: “Do you feel safe walking alone down your street after dark?” and “Do you agree that most people can be trusted?”, and civic trust by asking two questions: “Do you feel valued by society?” and “Do you feel there are opportunities to have a real say on issues that are important to you?”

2.8. Missing data (unweighted)

Less than 5% of respondents refused to answer or were unable to answer the survey questions for all variables; with the exception of, total annual household income (15%), perception of neighbourhood (22%), feeling safe walking down street alone after dark (7%), and feeling valued by society (6%). Missing data was excluded from the analysis in the case of the outcome variable, but retained as a category for all independent variables.

2.9. Statistical analysis

We analysed the survey data using the Stata statistical software package version 12 (StataCorp, 2011a) and used the following steps to analyse the data:

- 1 Univariable logistic regression to identify independent variables that were significantly associated with psychological distress (Tables 1 and 2).

- 2 Bivariable logistic regression to investigate the impact of each significant independent variable on the association between psychological distress and Aboriginal status (Table 3).
- 3 Multivariable logistic regression to further investigate the impact each independent variable had on the association between psychological distress and Aboriginal status, controlling for all non-SES socio-demographic characteristics which were treated as nuisance variables (Table 4).
- 4 Posited that any SES or social capital variable that confounded the association between psychological distress and Aboriginal status was a potential explanatory variable, independent of non-SES socio-demographic characteristics. We determined confounding by comparing the crude odds ratio (OR) of the association between psychological distress and Aboriginal status with the adjusted OR when each variable was included in the model (McNamee, 2003).
- 5 Given that there is no universally agreed threshold degree of change that distinguishes between an important confounder and one that is not, we fitted six multivariable models based on the percentage degree of change that each variable made to the crude OR (Table 5). For example, the first model only included variables that reduced the crude OR by 7% or more, the second model only included those that reduced the crude OR by 8%, and so forth. If the association between psychological distress and Aboriginal status was then rendered statistically insignificant, we judged the model to largely explain the association. We use the term “largely” rather than “fully” in recognition of the fact that any p-value used to declare statistical insignificance is essentially arbitrary. Therefore, one cannot rule out that other variables may still contribute to explaining the association.

We determined statistical significance at the $p < 0.05$ level. We tested for interaction by fitting interaction terms between the main independent variable of interest (Aboriginal status) and all factors that were found to be statistically significantly associated with psychological distress. There was no evidence of interaction.

We evaluated the adequacy of the final models using the Hosmer–Lemeshow goodness-of-fit test developed specifically for complex survey data (Archer et al., 2007). However, in the absence of any other diagnostic tests using complex survey data, it is suggested that diagnostic evaluation also be based on those available for ordinary logistics regression (Hosmer et al., 2013). These included the likelihood ratio chi square test (χ^2_{LR}) and area under the receiver operating characteristics (ROC) curve.

We used the STATA survey (svy) commands which were designed specifically for analysing data from surveys. Before any of the survey estimation commands can be used, the svyset command was used to specify the variables that describe the stratification, sampling weight, and the primary sampling unit. These commands correct the standard errors for the effects of clustering and stratification, as well as the impact of sampling weights when computing the 95% confidence intervals (StataCorp, 2011b).

3. Results

All LGAs contributed respondents to the Aboriginal sample, with a maximum of 3% of the total sample from any given LGA.

Table 1 shows psychological distress by socio-demographic characteristics. Aboriginal Victorians were more than twice as likely as their non-Aboriginal counterparts to have psychological distress (OR = 2.56; 95% confidence interval (CI): 1.67–3.93).

Being female, unmarried or not living with a partner, and/or a lone parent was positively associated psychological distress. Whether a household had a dependent child or not and being resident in rural Victoria were not associated with psychological

distress. By contrast, age was inversely associated with psychological distress, with increasing age appearing to be protective against psychological distress. Household size appeared to demonstrate a u-shaped relationship where psychological distress was associated with both lone person households and households with large numbers of people.

All six indicators of SES were inversely associated with psychological distress, the largest effect size being for food insecurity (OR = 5.76; 4.88–6.80).

Table 2 shows psychological distress by social capital. Social contact and perception of the residential neighbourhood were both positively associated with psychological distress. By contrast, neighbourhood tenure was only associated with psychological distress if the individual had lived in their neighbourhood for less than one year.

Lack of social support was positively associated with psychological distress and showed a strong dose–response relationship with the largest effect size for the inability to get help from all three sources of social support (OR = 7.02; 5.08–9.71).

All four measures of social and civic trust were positively associated with psychological distress, and showed a strong dose–response relationship with the largest effect size for those who responded negatively for all four measures (OR = 10.53; 7.94–13.97).

Table 3 shows the results of the bivariable analysis, where the primary association of interest was the association between psychological distress and Aboriginal status, with each socio-demographic characteristic and measure of social capital individually included to investigate their impact.

None of the socio-demographic characteristics, with the exception of all indicators of SES, made a large impact on the association between psychological distress and Aboriginal status. Controlling for all indicators of SES collectively reduced the crude OR by 33%.

3.1. Social capital

Controlling for the three indicators of the individual's social environment collectively reduced the crude OR by 12%. In contrast,

controlling for the three indicators of social support collectively only reduced the crude OR by 2%. However, this appeared to be due to two of the indicators influencing the crude OR in opposite directions. Controlling for the inability to get help from family reduced the crude OR by 7%, while controlling for the inability to get help from friends increased the crude OR by 5%. Controlling for the four measures of social and civic trust collectively reduced the crude OR by 13%.

Table 4 shows the results of the first multivariable analysis which investigated the impact that each measure of SES and social capital had on the primary association of interest (psychological distress and Aboriginal status), after controlling for all non-SES socio-demographic characteristics. We observed an increase in the impact of household income, employment status, education, home ownership, and financial stress on the crude OR of the association between psychological distress and Aboriginal status. However, controlling for non-SES socio-demographic characteristics made no difference to the impact of food insecurity.

Controlling for all non-SES socio-demographic characteristics, we observed an increase in the impact of all three measures of an individual's social environment, all three measures of social support, and four measures of social and civic trust on the crude OR of the association between psychological distress and Aboriginal status.

Table 5 shows the results of the final multivariable analysis. All models controlled for the non-SES socio-demographic characteristics. Six models were fitted based on the percentage change to the crude OR of the association between psychological distress and Aboriginal status. In models 1 to 4, the OR was reduced from 2.56 to 1.5 and were no longer statistically significant; suggesting that all models largely explained the association between psychological distress and Aboriginal status.

The Hosmer–Lemeshow goodness-of-fit tests indicated that all models provided a good fit to the data. However, model 4, which only included variables that changed the crude OR by 10% or more, was reduced to 9 explanatory variables, compared with 13 variables in model 1. Model 5 included variables that changed the crude OR by 11% or more and was reduced to 5 explanatory variables (all SES). However, the association between psychological distress and Aboriginal status was statistically significant; suggesting that SES

Table 6
Recommendations for policy directions and interventions.

Evidence	Policy directions	Interventions
Inequalities in bonding social capital	<ul style="list-style-type: none"> Support for further research to understand the causes including determining if this is linked to being a member of the stolen generations. Formal recognition of the need to support Aboriginal families and to provide culturally appropriate resources. 	<ul style="list-style-type: none"> Adapt and implement <i>The family wellbeing Program</i>^a Adapt and implement the Australian government initiative: <i>Bringing them Home and Indigenous mental health program</i>^b
Inequalities in bridging and linking social capital	<ul style="list-style-type: none"> Formal recognition of racism as a key determinant of the health and wellbeing of Aboriginal Victorians, and a potential cause of low bridging and linking social capital. Promote social inclusion, but not to the detriment of Aboriginal culture. 	<ul style="list-style-type: none"> Anti-racism public media campaigns. Development and incorporation of anti-racism education programs into primary and secondary school curricula. Mandatory sustainable Aboriginal cultural awareness training for all public servants, educators, law enforcement personnel, and health care sector staff. Development and implementation of Programs that focus on encouraging social participation by Aboriginal Victorians.
Inequalities in socioeconomic status (SES)	<ul style="list-style-type: none"> Formal recognition of the harm to health and wellbeing of large inequalities in SES. Commitment to reducing the household income, educational and employment gaps. 	<ul style="list-style-type: none"> Improve employment support and training. Increase access to affordable housing. Increase educational opportunities.

^a An exemplar of a comprehensive program delivered in the Northern Territory and Queensland, shown to be effective, that focussed on enhancing an individual's sense of empowerment and control over his/her life, as well as a community's collective self-esteem. The program involved addressing trauma and dysfunction and developing problem solving, conflict resolution and communication skills.

^b An exemplar of a suite of programs delivered across Australia, shown to be effective, that involved tracing and reconnecting family members, as well as counselling stolen generation members.

Sources: (Anderson et al., 2004; Berman and Paradies, 2010; Dudgeon et al., 2014).

alone only partially explained the association. Therefore model 4 largely explained the association with the least number of explanatory variables. Moreover, all diagnostic tests indicated that the model was adequate: Hosmer–Lemeshow goodness-of-fit test = $F(9,34082) = 1.05$, $p = 0.40$; $\chi^2_{LR}(11) = 847.2$, $p < 0.001$; area under ROC curve = 0.75.

Low SES, poor perception of the neighbourhood, inability to get help from family, and social and civic distrust largely explained the higher prevalence of psychological distress among Aboriginal compared with non-Aboriginal adults in Victoria.

4. Discussion

We show that inequalities in social capital and SES largely explained the higher prevalence of psychological distress among Aboriginal adults in Victoria, compared with their non-Aboriginal counterparts.

The social capital measures that partially explained the association between psychological distress and Aboriginal status included the ability to get social support from family, an indicator of bonding social capital. Our finding that Aboriginal Victorians were significantly less able to get help from family when needed and that this partially explained the association between psychological distress and Aboriginal status, suggests an inequality in bonding social capital. Families are an important source of support, and lack of family support is likely to increase personal vulnerability, particularly during difficult times. It is worth noting that Aboriginal Victorians bore the highest burden of child removal of any state in Australia; a systematic attempt by Australian governments from the late 1800s to the 1970s to ‘assimilate’ Aboriginal people, commonly referred to as ‘the stolen generations’ (Perkins and Langton, 2010). It is possible that our finding reflects the success of these past government policies. This finding would indicate an important area for further research. Moreover, consideration should be given to developing policies and interventions, in consultation with key Aboriginal organisations, to support those who lack family support and reduce intergenerational transmission of its consequences (see Table 6).

Our finding of lower bonding social capital is in contrast with the majority of studies which found high levels of bonding social capital among Aboriginal communities (Browne-Yung et al., 2013). However, almost all these studies were qualitative, did not directly compare between Aboriginal and non-Aboriginal people, and were conducted in remote or rural Aboriginal-dominated communities. It is therefore unclear if our finding is unique to the Victorian experience or because of differences in the study design and the inclusion of a non-Aboriginal comparator group. However, another study that also used a quantitative study design to directly compare levels of social capital between Aboriginal and non-Aboriginal residents of rural New South Wales, found no differences in social capital, although the author points out that the sample size was very small (Berry, 2009).

The social capital measure of perception of the neighbourhood also partially explained the association between psychological distress and Aboriginal status. This was based on the response to six questions: those relating to the physical environment may reflect linking as well as bridging social capital since the formal institutions of power are responsible for the physical environment, while those related to the social environment may reflect bridging social capital. Our finding that Aboriginal Victorians were more likely to rate their neighbourhoods as poor for both the physical and social environment suggests inequalities in both bridging and linking social capital.

The final two social capital indicators that partially explained the association between psychological distress and Aboriginal

status were social and civic trust. Social and civic trust are important indicators of social capital that enable cooperative and altruistic behaviours which enhance the collective wellbeing and the attainment of collective goals. For example, trust in our civic institutions and the people who run them, (e.g. the healthcare system), is essential for maximising an individual's health and wellbeing. Social trust is an indicator of bridging social capital and our finding that Aboriginal Victorians were less likely to agree that most people could be trusted, suggests lower bridging capital. Similarly, civic trust is an indicator of bridging and linking social capital. Therefore our finding that Aboriginal Victorians were less likely to feel valued by society, suggests lower bridging and linking social capital. Consistent with our findings, trust has been shown to be inversely associated with psychological distress even after adjusting for socio-demographic, SES, and health-related factors (Phongsavan et al., 2006). Moreover, our findings are also consistent with the majority of studies conducted across Australia that found lower levels of bridging and linking social capital among Aboriginal populations (Brough et al., 2006; Browne-Yung et al., 2013).

Low levels of bridging and linking social capital reported among an urban Aboriginal population in the state of South Australia appeared to be the consequence of social exclusion, due to racism and discrimination (Browne-Yung et al., 2013). Moreover, there is substantial evidence that low levels of trust in society and its institutions among Aboriginal Australians are also the consequence of experiences of racism and discrimination, and result in psychological distress (Awofeso, 2011; Browne-Yung et al., 2013; Ziersch et al., 2011). These findings suggest that racism and discrimination are antecedents of low bridging and linking social capital, which in turn may be antecedents of psychological distress. This does not, however, rule out the possibility and likelihood that there is also a causal pathway in the reverse direction.

Aboriginal Australians continue to be one of the most socially excluded populations, victimised by discrimination and racism at the personal, societal, and institutional levels (Ferdinand et al., 2012; Henry et al., 2004). In 2011, almost every Aboriginal Victorian had experienced at least one episode of racism in the 12 months preceding the survey, and more than 70% had experienced eight or more incidents (Ferdinand et al., 2012). Consequently 50% of all participants had psychological distress and 30% avoided various situations in daily life. Being a victim of racism has deleterious impacts on health via multiple pathways: for example, distrust causing reluctance to attend mainstream health services thus presenting late for medical problems; discrimination in the employment market and education system leading to lower SES; and psychological distress (Henry et al., 2004; Paradies, 2006). In an attempt to cope, being a victim of racism has also been shown to be associated with a higher prevalence of risk-taking behaviours such as smoking (Ziersch et al., 2011). It has long been suggested that racism is a key determinant of the health and wellbeing of Aboriginal Australians.

While we did not collect any specific data about experiences of racism, our findings that there were inequalities in all three type of social capital among Aboriginal Victorians may reflect experiences of racism. This would suggest an important area for intervention. By finding ways to build higher levels of all three types of social capital, spill-over benefits may include the simultaneous challenge of racist attitudes and beliefs, since racism is often borne out of ignorance and lack of cultural exposure (Hodson and Busseri, 2012).

In addition to inequalities in social capital, we found that inequalities in SES also partially explained the association between psychological distress and Aboriginal status. We used six indicators of SES: total annual household income, employment status, education, home ownership (as a proxy for wealth), and financial stress

and food insecurity (as proxies for poverty). All indicators were inversely associated with psychological distress, and capture different facets of SES (Braveman et al., 2001). We chose to use all available indicators of SES in order to minimise residual confounding due to unmeasured aspects of SES. Addressing inequalities in SES is an important area of intervention given the strong and consistent relationship between poor health and low SES (see Table 6).

4.1. Strengths of the study

This is the first population-based study of its kind in the state of Victoria that surveyed both Aboriginal and non-Aboriginal people, enabling direct comparisons to be made between the two populations.

The 2008 VPHS had a good response rate of 65% which was higher than many population-based studies both nationally and internationally.

To the best of our knowledge, with the exception of a small study conducted in a non-representative sample of Aboriginal people in rural New South Wales (Berry, 2009), this is the first time the full Kessler 10 Psychological Distress Scale has been used in an Australian Aboriginal population and directly compared with a non-Aboriginal population in the same study.

4.2. Limitations of the study

The absolute sample size of Aboriginal Victorians was 339 with a power of 80.5% to detect an OR of 1.8, $\alpha = 0.05$ (2-sided). This may have limited our ability to detect statistically significant differences in smaller effect sizes (Type 1 error).

The data are self-reported and 15.2% (unweighted data) of respondents refused or were unable to indicate their total annual household income, although this was similar between Aboriginal (13.3%) and non-Aboriginal Victorians (15.1%). However, if this measurement error is randomly distributed across the study population (non-differential misclassification), it would be expected to drive the direction of the association between the outcome and primary exposure variable towards the null (Rothman, 2002). We found that the dominant characteristics of both Aboriginal and non-Aboriginal respondents who did not declare their household income were that they were young (less than 25 years of age), female, had a low level of education, and lived in a group household.

The data are cross-sectional and therefore causality and its direction cannot be inferred.

A non-response analysis indicated a selection bias where males and people aged 18–34 years were under-represented. This was corrected for by weighting the data by the sex, age and geographic distribution of the state as well as the probability of being selected. However, since the survey was conducted using computer-assisted telephone interviewing, a further selection bias was introduced by virtue of the fact that only people who could afford a landline telephone connection were included in the sample. Therefore there was an under-representation of very low SES adults. This means that we are likely to have under-estimated the true prevalence of psychological distress in Victoria. However, this does not invalidate our findings but rather suggests that the prevalence of psychological distress may be larger than we have been able to enumerate here.

5. Conclusions

While it is well documented that Aboriginal Australians are more likely to suffer from psychological distress than their non-Aboriginal counterparts, little attention has been given to this key

health risk factor beyond acknowledging its existence. By contrast, most public health efforts focus on the lifestyle risk factors of smoking, excessive consumption of alcohol, poor diet, and physical activity on a platform of personal responsibility, thereby continuing to reinforce negative stereotypes and fuel racist perceptions (Bond, 2005; Vos et al., 2009). Psychological distress needs to be acknowledged as an important health risk factor in the Aboriginal population, not least because psychological distress is in itself a risk factor for the lifestyle risk factors. Therefore policies and interventions that seek to address psychological distress and its underlying causes need to be developed and implemented. Our findings suggest that key areas of intervention would be to raise levels of all three types of social capital and to address the socio-economic inequalities among Aboriginal Victorians. Table 6 summarises potential policy directions and interventions supported by our findings. The list, however, is not exhaustive and implicit is the expectation that the rights of Aboriginal people to self-determination, political representation, and participation in all institutional processes, are paramount.

This work makes a contribution by being the first population-based study to quantitatively use a social determinants approach, to investigate inequalities in the prevalence of psychological distress between Aboriginal and non-Aboriginal people, and in an under-investigated part of the country. Moreover, it points the way forward in regard to future points of intervention and identifies the need to routinely include the measurement of experiences of racism in future population-based research of Aboriginal health and wellbeing, given that racism is a key determinant of Aboriginal health.

Disclaimer

The views expressed in this article are those of the authors and do not necessarily represent those of the Victorian Department of Health or the Victorian Government of Australia.

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Conflict of interest

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References

- Anderson, I., Baum, F., Bentley, M., 2004. Beyond Band-aids: Exploring the Underlying Social Determinants of Aboriginal Health Papers from the Social Determinants of Aboriginal Health Workshop, Adelaide, July 2004. Cooperative Research Centre for Aboriginal Health, Darwin.
- Andrews, G., Slade, T., 2001. Interpreting scores on the Kessler psychological distress scale (K10). *Aust. N. Z. J. Public Health* 25, 494–497.
- Archer, K.J., Lemeshow, S., Hosmer, D.W., 2007. Goodness-of-fit tests for logistic regression models when data are collected using a complex sampling design. *Comput. Stat. Data Anal.* 51, 4450–4464.
- Australian Bureau of Statistics, 2012. 2075.0-Census of Population and Housing - Counts of Aboriginal and Torres Strait Islander Australians, 2011. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2075.0main+features32011>.
- Australian Institute of Health and Welfare, 2011. The Health and Welfare of Australia's Aboriginal and Torres Strait Islander People, an Overview 2011. Cat. no.

- AIHW 42. Canberra.
- Australian museum, 2014. Indigenous Australians Overview. Available at: <http://australianmuseum.net.au/Indigenous-Australia>.
- Awofeso, N., 2011. Racism: a major impediment to optimal indigenous health and health care in Australia. *Aust. Indig. Health Bull.* 11, 1–13.
- Berman, G., Paradies, Y., 2010. Racism, disadvantage and multiculturalism: towards effective anti-racist praxis. *Ethn. Racial Stud.* 33, 214–232.
- Berry, H., 2009. Social capital and mental health among aboriginal Australians, new Australians, and other Australians living in a coastal region. *Aust. e-J. Adv. Ment. Health* 8, 1–13.
- Biddle, N., 2012. Measures of indigenous social capital and their relationship with well-being. *Aust. J. Rural Health* 20, 298–304.
- Biddle, N., 2014. Data about and for the Aboriginal and Torres Strait Islander Australians. Available at: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129548209>.
- Bird, C.E., Conrad, P., Fremont, A.M., Timmermans, S. (Eds.), 2010. *Handbook of Medical Sociology*. Vanderbilt University Press, Nashville, TN.
- Bond, C.J., 2005. A culture of ill health: public health or aboriginality? *Med. J. Aust.* 183, 39–41.
- Braveman, P., Cubbin, C., Marchi, K., Egerter, S., Chavez, G., 2001. Measuring socioeconomic status/position in studies of racial/ethnic disparities: maternal and infant health. *Public Health Rep.* 116, 449.
- Brough, M., Bond, C., Hunt, J., Jenkins, D., Shannon, C., Schubert, L., 2006. Social capital meets identity: aboriginality in a urban setting. *J. Sociol.* 42, 396–411.
- Browne-Yung, K., Ziersch, A., Baum, F., Gallaher, G., 2013. Aboriginal Australians' experience of social capital and its relevance to health and wellbeing in urban settings. *Soc. Sci. Med.* 97, 20–28.
- Cunningham, J., Paradies, Y.C., 2012. Socio-demographic factors and psychological distress in indigenous and non-Indigenous Australian adults aged 18–64 years: analysis of national survey data. *BMC Public Health* 12, 95.
- Dudgeon, P., Walker, R., Scrine, C., Shepherd, C., Calma, T., Ring, I., 2014. Effective Strategies to Strengthen the Mental Health and Wellbeing of Aboriginal and Torres Strait Islander People. Closing the Gap Clearinghouse. Issues paper No. 12.
- Ensel, W.M., Lin, N., 1991. The life stress paradigm and psychological distress. *J. Health Soc. Behav.* 32, 321–341.
- Ferdinand, A., Paradies, Y., Kelaher, M., 2012. Mental Health Impacts of Racial Discrimination in Victorian Aboriginal Communities: The Localities Embracing and Accepting Diversity (LEAD) Experiences of Racism Survey. The Lowitja Institute, Melbourne. Available at: https://www.lowitja.org.au/sites/default/files/docs/LEAD%20Report-WEB_0.pdf.
- Hamer, M., Kivimaki, M., Stamatakis, E., Batty, G.D., 2012. Psychological distress as a risk factor for death from cerebrovascular disease. *Can. Med. Assoc. J.* 184, 1461–1466.
- Henry, B.R., Houston, S., Mooney, G.H., 2004. Institutional racism in Australian healthcare: a plea for decency. *Med. J. Aust.* 180, 517–520.
- Hodson, G., Busseri, M.A., 2012. Bright minds and dark attitudes: lower cognitive ability predicts greater prejudice through right-wing ideology and low intergroup contact. *Psychol. Sci.* 23, 187–195.
- Holden, L., Scuffham, P., Hilton, M., Vecchio, N., Whiteford, H., 2010. Psychological distress is associated with a range of high-priority health conditions affecting working Australians. *Aust. N. Z. J. Public Health* 34, 304–310.
- Hosmer, D.W.J., Lemeshow, S., Sturdivant, R.X. (Eds.), 2013. *Applied Logistic Regression*. John Wiley & Sons, Inc, Hoboken, New Jersey.
- Jorm, A.F., Bourchier, S.J., Cvetkovski, S., Stewart, G., 2012. Mental health of indigenous Australians: a review of findings from community surveys. *Med. J. Aust.* 196, 118–121.
- Kawachi, I., Berkman, L.F., 2001. Social ties and mental health. *J. Urban Health* 78, 458–467.
- Markwick, A., Haider, S., Vaughan, L., Ansari, Z., 2011. The Health and Wellbeing of Aboriginal Victorians. Victorian Population Health Survey 2008 Supplementary Report. Available at: <http://www.health.vic.gov.au/healthstatus/survey/vphs-aboriginal.htm>.
- McNamee, R., 2003. Confounding and confounders. *Occup. Environ. Med.* 60, 227–234 quiz 164, 234.
- Mignone, J., 2009. Social capital and aboriginal communities: a critical assessment synthesis and assessment of the body of knowledge on social capital with emphasis on aboriginal communities. *J. Aborig. Health* 5, 100–147.
- Paradies, Y., 2006. A systematic review of empirical research on self-reported racism and health. *Int. J. Epidemiol.* 35, 888–901.
- Perkins, R., Langton, M. (Eds.), 2010. *First Australians: An Illustrated History*. Miegunyah Press, Carlton, Melbourne.
- Phongsavan, P., Chey, T., Bauman, A., Brooks, R., Silove, D., 2006. Social capital, socioeconomic status and psychological distress among Australian adults. *Soc. Sci. Med.* 63, 2546–2561.
- Pratt, L.A., 2009. Serious psychological distress, as measured by the K6, and mortality. *Ann. Epidemiol.* 19, 202–209.
- Rothman, K.J., 2002. *Epidemiology: An Introduction*. Oxford University Press, New York.
- Stansfeld, S.A., Fuhrer, R., Shipley, M.J., Marmot, M.G., 2002. Psychological distress as a risk factor for coronary heart disease in the Whitehall II Study. *Int. J. Epidemiol.* 31, 248–255.
- StataCorp, 2011a. *Stata Statistical Software: Release 12*. StataCorp LP, College Station, TX (accessed 02.08.14.).
- StataCorp, 2011b. *The Survey Data Reference Manual*. Available at: <http://www.stata.com/features/survey-data/svy-survey.pdf>.
- Thorpe, K., Bell-Booth, R., Staton, S., Thompson, C., 2013. Bonding and bridging: transition to school and social capital formation among a community of indigenous Australian children. *J. Community Psychol.* 41, 827–843.
- Vos, T., Barker, B., Begg, S., Stanley, L., Lopez, A.D., 2009. Burden of disease and injury in aboriginal and torres strait islander peoples: the indigenous health gap. *Int. J. Epidemiol.* 38, 470–477.
- Ziersch, A.M., Gallaher, G., Baum, F., Bentley, M., 2011. Responding to racism: insights on how racism can damage health from an urban study of Australian aboriginal people. *Soc. Sci. Med.* 73, 1045–1053.

CHAPTER 6: EXPERIENCES OF RACISM

This chapter includes a peer-reviewed paper that was published in BMC Public Health (attached at the end of the chapter).

Markwick, A., Ansari, Z., Clinch, D., and McNeil, J. (2019). "Experiences of racism among Aboriginal and Torres Strait Islander adults living in the Australian state of Victoria: a cross-sectional population-based study." *BMC Public Health* **19**: 309–23.

6.1 Introduction

Chapter 5 found inequalities in social capital, particularly bridging and linking social capital, which have been shown to be associated with racism and discrimination. Based on this finding and the identification of racism as a social determinant of Aboriginal and Torres Strait Islander health in the literature review in chapter 1 that appears to underlie and be common to many other social determinants, it was decided that racism against Aboriginal and Torres Strait Islander Victorians would be investigated in this chapter.

The purpose of this study was to investigate racism directed against Aboriginal and Torres Strait Islander adults who live in Victoria.

6.2 Aims

The aims of this chapter were to:

1. Determine the prevalence of experiences of racism among Aboriginal and Torres Strait Islander Victorians.
2. Determine if experiences of racism were independent of behavioural risk factors and social determinants, such as socioeconomic status, that are often used to justify negative stereotypes
3. Describe potential pathways by which experiences of racism may impact on Aboriginal and Torres Strait Islander Victorians to create inequalities in health
4. Identify key points of intervention and potential strategies to combat racism.

6.3 Summary

The prevalence of experiences of racism among Aboriginal and Torres Strait Islander adults in Victoria was 17%, more than four times higher than non-Aboriginal and Torres Strait Islander adults—OR = 4.3 (95% confidence interval (CI): 3.2–5.8). When the comparison group consisted of adults of mainly Anglo-Celtic origin, Aboriginal and Torres Strait Islander adults were seven times more likely (OR=7.2; 5.3–9.7) to have experienced racism.

Using multivariable logistic regression and controlling for age, gender, rurality, three measures of socioeconomic status (household income, education, and employment status), social capital (social support and civic and social trust), behavioural risk factors (smoking, alcohol consumption, unhealthy body weight, and physical inactivity) reduced the OR to 3.1 (2.2-4.3). However, Aboriginal and Torres Strait Islander adults were still 3 times more likely to experience racism than their non-Aboriginal and Torres Strait Islander counterparts.

Some other findings of note were that for most of the measures of socioeconomic status the higher the socioeconomic status the more likely an Aboriginal and Torres Strait Islander Victorian was to experience racism. Moreover, when education was included in the multivariable logistic regression analysis, it appears that low levels of education may actually be protective against experiences of racism.

6.4 Conclusions

Racism against Aboriginal and Torres Strait Islander adults in Victoria is substantial and cannot be ascribed to any specific attributes such as low socioeconomic status or stigma-associated behavioural risk factors, such as alcohol consumption.

While almost one in five Aboriginal and Torres Strait Islander adults in Victoria experienced racism in the 12 months preceding the survey interview, this is likely to be a substantial underestimate of the true prevalence of experiences of racism. That is because studies consistently show that experiences of racism are underreported (Krieger 2014). Moreover, studies show that people are more likely to report experiences of racism if the question is phrased to ask about the experiences of the ethnoracial group to which they belong, rather than their personal experiences (Krieger 2014). This may be, at least in part, due to the psychologically protective benefits of minimising personal experiences of racism (Hodson and Esses 2002).

There is an abundance of literature that documents multiple pathways by which racism damages health. Contrary to the current discourse in Australia, racism is not harmless and may be a key determinant of Aboriginal and Torres Strait Islander health.

6.5 References

Hodson, G. and V.M. Esses (2002). "Distancing oneself from negative attributes and the personal/group discrimination discrepancy." Journal of Experimental Social Psychology **38**: 500-7.

Krieger, N (2014). "Discrimination and health inequities." Social epidemiology. L.F. Berkman, I. Kawachi, and M.M. Glymour. Oxford university press: New York, NY.

6.6 Publication

RESEARCH ARTICLE

Open Access



Experiences of racism among Aboriginal and Torres Strait Islander adults living in the Australian state of Victoria: a cross-sectional population-based study

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Abstract

Background: Racism is a key determinant of the health of Indigenous Australians that may explain the unremitting gap in health and socioeconomic outcomes between Indigenous and non-Indigenous Australians. We quantified the population-based prevalence of experiences of racism of Indigenous adults in the Australian state of Victoria and investigated whether this was independent of social determinants and lifestyle risk factors.

Methods: We combined data from the 2011, 2012 and 2014 Victorian Population Health Surveys to obtain a sample size of 33,833 Victorian adults, including 387 Indigenous adults. The survey is a cross-sectional, population-based, computer-assisted telephone interview survey conducted annually. Using logistic regression, experiences of racism was the dependent variable and Indigenous status the primary independent variable of interest. Secondary independent variables included age, sex, rurality, socioeconomic status, social capital, and lifestyle risk factors.

Results: Indigenous Victorian adults were four times more likely than their non-Indigenous counterparts to have experienced racism in the preceding 12 months; odds ratio (OR) = 4.3 (95% confidence interval (CI): 3.2–5.8). Controlling for social determinants and lifestyle risk factors attenuated, but did not eliminate, the association between experiences of racism and Indigenous status; OR = 3.1 (95% CI: 2.2–4.3). The social determinants of age and social trust made the largest contribution to the attenuation of the association. Education also had a large impact on the association, but in the opposite direction, suggesting that a low level of education may be protective against experiences of racism. When the non-Indigenous comparison group consisted of adults of mainly Anglo-Celtic origin, Indigenous adults were seven times more likely (OR = 7.2; 5.3–9.7) to have experienced racism.

Conclusions: Racism directed against Indigenous Victorians is significant and cannot be ascribed to any specific attributes such as socioeconomic status or lifestyle risk factors. We argue that a human rights-based approach to policy-making for the elimination of systemic and interpersonal racism offers an opportunity and viable alternative to current policy-making, that continues to be dominated by a paternalistic approach that reinforces racism and the resulting inequities.

(Continued on next page)

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Please note: Throughout this document, the term Indigenous is taken to include people of Aboriginal and Torres Strait Islander descent. While not our preferred term, Indigenous is used in preference to Aboriginal and Koori as not all Indigenous people living in Victoria are Aboriginal or Koori. We recognise that, with the exception of the term 'Koori', these terms are Eurocentric having been imposed upon a people of many nations with distinct languages and cultures. The use of such terms is akin to referring to the peoples of the continent of Europe as 'Europeans'.

Keywords: Experiences of racism, Indigenous status, Social determinants, Social capital, Socioeconomic status, Education, Lifestyle risk factors, Australia, Victoria

Background

The history of Indigenous people in Australia over the last two hundred years since the arrival of Europeans is one of great suffering. Genocide, the introduction of European diseases, dispossession, subjugation and segregation reduced the Indigenous population by 90% between 1788 and 1900 [1]. A conservative estimate indicates that prior to European contact there were approximately 15,000 Indigenous Australians living in the state of Victoria; that number was reduced to approximately 850 by 1901 [2].

Today, Indigenous Australians continue to face interpersonal and institutional racism which creates and sustains their lower socioeconomic status by excluding them from economic opportunities and land ownership. Moreover, Indigenous men and women can expect to live 10.6 and 9.5 years less than non-Indigenous men and women respectively [3]. A large and growing body of evidence consistently implicates racism as a key determinant of the health of Indigenous Australians [4, 5].

However, one of the most persistent aspects of today's discourse regarding racism in Australia is the very denial of its existence [6]. A review of the linguistic and discursive patterns of contemporary speech in both informal and formal (parliamentary debates, political speeches, and the media) settings in Australia concluded that the social taboo against openly expressing racist beliefs has led to the development of strategies that present negative views of minority groups as reasonable and justified, while exonerating the speaker from charges of racism. This serves to constrain political efforts to address racism thus reinforcing racism [6].

In this paper we sought to: (a) quantify the population-based prevalence of racism experienced by Indigenous Australians who lived in the state of Victoria; (b) determine if experiences of racism among Indigenous Victorians are independent of lifestyle risk factors and social determinants, such as socioeconomic status, that are often used to justify negative stereotypes; (c) describe potential pathways by which experiences of racism impacts on Indigenous Victorians to create inequalities in health; and (d) identify key points of intervention and potential strategies to combat racism.

On an individual level, racism refers to the beliefs and attitudes that members of certain groups have of their superiority in relation to other groups who are regarded as inferior, based on race, ethnicity or cultural background [7]. Those who are assumed to be inferior are treated differently and unfavourably.

At a societal level, racism can be defined as "... that which maintains or exacerbates inequality of opportunity among ethnoracial groups" and racial discrimination as the racist behaviours and practices that result in inequality of opportunity among ethnoracial groups [8].

Methods

Data source

The Victorian Population Health Survey is an annual cross-sectional population-based survey that collects information on the health of adults who live in the Australian state of Victoria [9]. Random digit dialling of landline telephone was used to randomly select adults aged 18 years or older who lived in private dwellings.

The views expressed in this article are those of the authors and do not necessarily represent those of the Victorian Department of Health and Human Services or the Victorian Government of Australia.

Sample size

We merged three Victorian Population Health Survey datasets to attain a sufficient number of adults who identified as Indigenous. This included data from the 2011 survey (33,673 participants), the 2012 survey (7533 participants), and the 2014 survey (33,654 participants). The sample size of the 2011 and 2014 surveys was based on recruiting approximately 426 participants for each of the 79 local government areas of Victoria, while the 2012 survey was based on recruiting approximately 900 participants for each of the 8 departmental regions. The sample size was based on detecting a variable of interest with a prevalence of 7.5%, confidence interval of 5.0 to 10.0%, and a relative standard error of 17%.

We deleted all non-Indigenous participants from the 2011 and 2012 surveys because they were not asked about experiences of racism. The combined dataset was

stratified by departmental region and the final sample size was 33,833, which included 387 Indigenous participants.

Response rate

The response rate was defined as the proportion of households where contact was made and an interview completed. It was 67% for the 2011 survey, 69% for the 2012 survey, and 70% for the 2014 survey.

Weighting

To reduce participation bias, we reweighted the survey data to reflect the age/sex/geographic distribution of the census Indigenous and non-Indigenous resident population of Victoria in 2011 and the probability of selection of the household and the participant within the household. We then normalised the resulting weights to add up to the sample total in order to maximise the accuracy of the standard errors [10].

Ethics statement

The survey was approved by the Victorian Department of Health Human Research Ethics Committee in accordance with the guidelines of the Declaration of Helsinki. Since the Victorian Population Health Survey is a general population health survey, there was no consideration of the Guidelines for Ethical Research in Australian Indigenous Studies.

Variables

Experiences of racism were assessed by asking the following question in the 2011 and 2012 survey: "How often, if at all, have you received unfair treatment in the last 12 months because you are an Aboriginal or Torres Strait Islander?" Since only Indigenous participants were asked about experiences of racism in the 2011 and 2012 surveys, all non-Indigenous participants of these two surveys were eliminated from the combined dataset. In the 2014 survey all participants, regardless of Indigenous status, were asked the question "In the last 12 months, have you experienced discrimination or been treated unfairly because of your racial, ethnic, cultural, or religious background?" Although not identical, we combined the three studies to attain a sufficient sample size of Indigenous participants on the presupposition that both questions were a reasonable measure of experiences of racism.

As we were interested in exploring experiences of racism among the Indigenous survey participants, the primary independent variable of interest was Indigenous status. To determine Indigenous status, participants in all three surveys were asked "Are you of Aboriginal or Torres Strait Islander origin?" Participants who stated that they were Aboriginal ($n = 328$), Torres Strait Islander ($n = 39$) or both ($n = 20$) were combined.

The social determinants we investigated included socio-demographic characteristics and social capital. Socio-demographic variables included: age, sex, rurality, and three indicators of socioeconomic status (total annual household income, educational attainment, and employment status). Total annual household income included pre-tax income from all sources such as wages, social security payments, child support, and investments over the previous 12 months. Social capital included social support (ability to get help from family, friends and/or neighbours when needed), and social and civic trust.

Social trust was assessed by asking two questions: "Do you feel safe walking alone down your street after dark?", and: "Do you agree that most people can be trusted?". Civic trust was assessed by asking the following questions: "Do you feel valued by society?", and: "Do you feel there are opportunities to have a real say on issues that are important to you?"

The lifestyle risk factors we investigated included smoking, alcohol consumption, unhealthy body weight, and physical inactivity. Survey participants disclosed their height and weight and their body mass index (BMI) was calculated. Underweight was defined as a BMI of less than 18.5 kg/m², normal weight as a BMI of 18.5–24.9 kg/m², overweight as a BMI of 25.0–29.9 kg/m², and obesity as a BMI of 30 kg/m² or more [11]. Physical inactivity was assessed using a series of questions and responses were compared against the National Physical Activity Guidelines for Australians to determine levels of physical inactivity [12].

Missing data

Less than 5% of participants refused to answer or were unable to answer the survey questions for all variables; except for total annual household income (17%), body weight status (10%), physical activity level (7%), and feeling valued by society (6%). Missing data were included in all analyses as a separate category.

Statistical analysis

We calculated weighted prevalence estimates for all variables with 95% confidence intervals (CI). We also calculated relative standard errors to determine the relative size of the sampling error and considered a relative standard error that exceeded 25% to be unreliable.

We used logistic regression to investigate the relationship between experiences of racism and Indigenous status. The dependent or outcome variable was experiences of racism (0 = never and 1 = at least once a year) and the primary independent or exposure variable of interest was Indigenous status (0 = no, 1 = yes and 9 = did not know or refused to say). We determined statistical significance at the $p < 0.05$ level.

We analysed the survey data with the Stata statistical software package version 12 [13], using the `svy` prefix commands that take into account the sampling design. We used the following steps:

- 1: Univariable logistic regression to identify independent variables that were associated with experiences of racism (Tables 1, 2 and 3).
- 2: Bivariable logistic regression to investigate the impact of each independent variable on the association between experiences of racism and Indigenous status (Table 4). We deemed that variables that increased or decreased the OR of the association between experiences of racism and Indigenous status by 10% or more were potentially explanatory variables [14].
- 3: Multivariable logistic regression (Table 4) to further investigate the contribution of all independent variables.

Results

Seventeen percent of Indigenous adults experienced at least one episode of racism in the year preceding the survey, compared with 4.5% of their non-Indigenous counterparts (Table 1). Thus, Indigenous adults living in Victoria were four times more likely than non-Indigenous adults to experience racism (odds ratio (OR) = 4.3; 95% CI = 3.2–5.8).

However, Victoria is a multicultural state with people from all over the world, including a large non-white non-Anglo-Celtic population who began to immigrate to Australia after the repeal of the White Australia Policy in 1973. By excluding participants who were not born in Australia to Australian-born parents and spoke a language other than English at home, we excluded the majority of the non-white non-Anglo-Celtic population who may similarly have experienced racism. While we assumed that there would be misclassification error, in the absence of any other data on ethnicity, the majority of those born in Australia to non-Indigenous Australian-born parents who only spoke English at home are likely at this point in time to be of the dominant white Anglo-Celtic population. This reduced the prevalence of experiences of racism in the non-Indigenous population from 4.5 to 2.8% (Table 1) and the OR of the association between experiences of racism and Indigenous status increased from 4.3 to 7.2 (5.3–9.7). Thus, Indigenous adults were 7 times more likely to experience racism than non-Indigenous adults who were born in Australia to Australian-born parents who only spoke English at home.

Socio-demographic variables that were significantly associated with experiences of racism included age, sex, rurality, and three indicators of socioeconomic status (Table 1). Age was inversely associated with experiences

of racism; as age increased, experiences of racism decreased. Males were more likely than females to experience racism, as were those who lived in metropolitan compared with rural Victoria.

The association of experiences of racism with socioeconomic status varied according to the measure employed. Living in a household with a total annual income of less than \$40,000, not being tertiary-educated, and not being in the labour force (unable to work, retired, engaged in home duties, or student) were associated with a lower prevalence of experiences of racism. In contrast, adults who were unemployed were almost twice as likely to experience racism as those who were employed.

Social support and trust are measures of 'social capital'. There is no single definition of social capital. However, in essence social capital refers to the nature and extent of one's social relationships across society, which determines access, or lack thereof, to the social and economic resources needed for a good life.

When we investigated the relationship of experiences of racism with social capital, we found that adults who were unable to get help when needed, irrespective of the source of help, were significantly more likely to experience racism than adults who were able to get help from any of these sources (Table 3). Similarly, social and civic trust were also associated with experiences of racism. Adults who did not believe that most people could be trusted were almost 4 times as likely as those that did believe most people could be trusted to experience racism; OR = 3.6 (3.1–4.1). Similarly, adults who did not feel safe walking alone down their street after dark, those who did not feel valued by society, and those who did not feel there were opportunities to have a real say on important matters, were more likely to experience racism.

When we investigated the relationship of experiences of racism and lifestyle risk factors, we found that adults who smoked, were underweight or obese, and who were physically inactive, were significantly more likely to experience racism than non-smokers, people of normal weight, and the physically active (Table 2). We used two measures of alcohol consumption and found a u-shaped relationship: Indigenous adults who abstained from alcohol consumption and those that drank excessively on any given occasion were both more likely to experience racism.

When we controlled for each secondary independent variable in a bivariable analysis; age, education, and social trust were the only three variables that changed the OR of the association between experiences of racism and Indigenous status by more than 10% and were thus deemed to be potentially explanatory of the association (Table 4).

In our study, twice as many non-Indigenous adults (44%) were aged 65 years and older compared with their Indigenous counterparts (22%). Controlling for age reduced the OR by 23% from 4.3 to 3.3 (2.5–4.5).

Table 1 Experiences of racism, by socio-demographic characteristics: univariable analysis

Variable	Experienced racism				Univariable analysis			
	n *	% weighted prevalence			Crude odds ratio (OR)			p value
		%	95% CI		OR	95% CI		
Indigenous status								
Non-Indigenous	1518	4.5	4.3	4.8	1.0	–	–	–
Indigenous	65	17.0	13.3	21.5	4.3	3.2	5.8	<0.001
Did not know or refused to say	13	15.3	8.9	25.1	3.8	2.0	7.1	<0.001
Indigenous status								
Anglo-Celtic **	576	2.8	2.6	3.0	1.0	–	–	–
Indigenous	65	17.0	13.3	21.5	7.2	5.3	9.7	<0.001
Did not know or refused to say	13	11.7	5.5	23.1	4.6	2.0	10.6	<0.001
Age (years)								
65+ years	294	2.0	1.8	2.3	1.0	–	–	–
55–64 years	363	4.6	4.2	5.2	2.3	2.0	2.8	<0.001
45–54 years	379	6.8	6.1	7.6	3.5	3.0	4.2	<0.001
35–44 years	333	8.9	8.0	10.0	4.7	4.0	5.6	<0.001
25–34 years	141	10.5	8.9	12.3	5.6	4.5	7.0	<0.001
18–24 years	86	10.5	8.5	12.9	5.6	4.3	7.3	<0.001
Sex								
Males	707	5.3	4.9	5.8	1.0	–	–	–
Females	889	4.3	4.0	4.6	0.8	0.7	0.9	<0.001
Geographic residence								
Metropolitan Victoria	874	6.5	6.1	6.9	1.0	–	–	–
Rural Victoria	722	3.6	3.3	3.8	0.5	0.5	0.6	<0.001
Total annual household income								
\$100,000 or more	302	5.3	4.7	6.0	1.0	–	–	–
\$40,000–\$99,999	530	5.1	4.6	5.5	1.0	0.8	1.1	0.529
Less than \$40,000	477	4.0	3.6	4.4	0.7	0.6	0.9	<0.001
Did not know or refused to say	287	4.8	4.2	5.4	0.9	0.7	1.1	0.200
Education								
Tertiary	637	6.6	6.1	7.1	1.0	–	–	–
Completed secondary	440	5.0	4.5	5.5	0.7	0.6	0.8	<0.001
Did not complete secondary	502	3.3	3.0	3.7	0.5	0.4	0.6	<0.001
Other/did not know/refused	17	5.3	3.3	8.6	0.8	0.5	1.3	0.392
Employment status								
Employed	905	6.0	5.6	6.4	1.0	–	–	–
Unemployed	95	10.6	8.6	13.1	1.9	1.5	2.4	<0.001
Not in the labour force #	575	3.2	3.0	3.5	0.5	0.5	0.6	<0.001
Did not know or refused to say	21	7.7	4.9	12.0	1.3	0.8	2.1	0.276

95% CI = 95% confidence interval

*n = raw unweighted sample size; however, prevalence and odds ratio estimates are based on weighted data

**Comparison group is participants who were born in Australia to non-Indigenous Australian-born parents and only spoke English

Included retirees (80%), home duties (10%), students (3%), and those who were unable to work (7%)

Bolding indicates that p value is significant at the p <0.05 level

Table 2 Experiences of racism, by social capital: univariable analysis

Measure of social capital	Experienced racism			Univariable analysis				
	n *	% weighted prevalence	95% CI	Crude odds ratio (OR)	95% CI	p value		
Able to get help from family?								
Yes	1026	3.9	3.7	4.2	1.0	–	–	–
Sometimes	274	7.2	6.4	8.2	1.9	1.6	2.2	<0.001
No	283	9.4	8.3	10.6	2.5	2.2	3.0	<0.001
Did not know or refused to say	13	5.5	3.1	9.5	1.4	0.8	2.6	0.255
Able to get help from friends?								
Yes	1086	4.1	3.8	4.3	1.0	–	–	–
Sometimes	342	7.8	7.0	8.7	2.0	1.7	2.3	<0.001
No	150	7.1	6.0	8.4	1.8	1.5	2.2	<0.001
Did not know or refused to say	18	4.9	3.0	7.9	1.2	0.7	2.0	0.485
Able to get help from neighbours?								
Yes	711	3.5	3.2	3.8	1.0	–	–	–
Sometimes	388	6.6	6.0	7.3	2.0	1.7	2.2	<0.001
No	452	7.1	6.4	7.8	2.1	1.8	2.4	<0.001
Did not know or refused to say	45	5.2	3.7	7.1	1.5	1.1	2.1	0.020
Believe most people can be trusted?								
Yes	446	2.9	2.6	3.2	1.0	–	–	–
Sometimes	696	5.4	5.0	5.8	1.9	1.7	2.2	<0.001
No	439	9.6	8.7	10.6	3.6	3.1	4.1	<0.001
Did not know or refused to say	15	2.2	1.3	3.8	0.8	0.4	1.3	0.341
Feel safe walking alone down street after dark?								
Yes	826	4.1	3.9	4.5	1.0	–	–	–
Sometimes	280	7.0	6.2	7.9	1.7	1.5	2.0	<0.001
No	411	5.8	5.2	6.4	1.4	1.2	1.6	<0.001
Not applicable	55	2.5	1.9	3.4	0.6	0.4	0.8	0.001
Did not know or refused to say	24	4.7	3.0	7.2	1.1	0.7	1.8	0.571
Feel valued by society?								
Yes	627	3.5	3.2	3.8	1.0	–	–	–
Sometimes	569	6.0	5.5	6.6	1.8	1.6	2.0	<0.001
No	321	7.8	7.0	8.8	2.4	2.0	2.7	<0.001
Did not know or refused to say	79	3.9	3.1	5.0	1.1	0.9	1.5	0.310
Feel there are opportunities to have a real say?								
Yes	414	3.1	2.8	3.4	1.0	–	–	–
Sometimes	573	5.0	4.6	5.4	1.7	1.4	1.9	<0.001
No	575	7.6	7.0	8.3	2.6	2.3	3.0	<0.001
Did not know or refused to say	34	3.4	2.4	4.8	1.1	0.8	1.6	0.591

95% CI = 95% confidence interval

*n = raw unweighted sample size; however, prevalence and odds ratio estimates are based on weighted data

Bolding indicates that p value is significant at the p <0.05 level

Similarly, a higher proportion of Indigenous adults (22%) than non-Indigenous adults (13%) did not believe that most people could be trusted. Controlling for social trust, reduced the OR by 12% from 4.3 to 3.8 (2.8–5.1).

In contrast, low educational attainment appeared to be protective against experiences of racism, as controlling for education increased the OR by 11% from 4.3 to 4.8 (3.6–6.5).

Table 3 Experiences of racism, by lifestyle risk factors: univariable analysis

Variable	Experienced racism			Univariable analysis				
	n *	% weighted prevalence			Crude odds ratio (OR)		p value	
		%	95% CI	OR	95% CI			
Smoking status								
Non-smoker	838	4.4	4.1	4.7	1.0	–	–	–
Ex-smoker	455	4.4	4.0	4.9	1.0	0.9	1.1	0.964
Smoker	292	7.1	6.3	8.1	1.7	1.4	1.9	<0.001
Did not know or refused to say	11	3.7	2.0	7.0	0.8	0.4	1.6	0.617
Alcohol consumption								
Consumed alcohol in past 12 months	1166	4.4	4.1	4.7	1.0	–	–	–
Abstained from alcohol consumption	429	5.8	5.2	6.4	1.3	1.2	1.5	<0.001
Did not know or refused to say	1	2.6	0.4	16.1	0.6	0.1	4.2	0.581
Alcohol consumption (typical number of standard drinks per drinking session)								
1 or 2 standard drinks	749	4.1	3.8	4.4	1.0	–	–	–
3 or 4 standard drinks	258	4.8	4.2	5.4	1.2	1.0	1.4	0.060
More than 4 standard drinks	589	5.7	5.3	6.2	1.4	1.3	1.6	<0.001
Body weight status								
Normal weight	509	4.3	3.9	4.7	1.0	–	–	–
Underweight	38	7.0	5.0	9.7	1.7	1.1	2.4	0.008
Overweight	554	4.8	4.4	5.3	1.1	1.0	1.3	0.088
Obese	370	5.0	4.5	5.5	1.2	1.0	1.3	0.048
Did not know or refused to say	145	4.6	3.9	5.4	1.1	0.9	1.3	0.573
Physical activity								
Sufficient PA	609	4.2	3.9	4.6	1.0	–	–	–
Insufficient PA	832	5.5	5.1	5.9	1.3	1.2	1.5	<0.001
Sedentary	58	3.2	2.4	4.2	0.8	0.6	1.0	0.058
Did not know or refused to say	97	3.9	3.2	4.8	0.9	0.7	1.2	0.505

95% CI = 95% confidence interval

*n = raw unweighted sample size; however, prevalence and odds ratio estimates are based on weighted data

Bolding indicates that p value is significant at the $p < 0.05$ level

When we included all secondary independent variables in a multivariable analysis, the OR was reduced by 29% from 4.3 to 3.0 (2.2–4.3). However, the association between experiences of racism and Indigenous status remained highly significant at the $p < 0.001$ level (Table 4).

Controlling for the three variables deemed to be potentially explanatory (age, education, and social trust) in a multivariable model, reduced the OR by 21% from 4.3 to 3.4 (2.5–4.7).

Controlling for all social determinants reduced the OR by 26% from 4.3 to 3.2 (2.3–4.5). In contrast, controlling for all lifestyle risk factors only reduced the OR by 10% from 4.3 to 3.9 (2.9–5.2).

Discussion

The prevalence of experiences of racism among Indigenous adults who lived in Victoria between 2011 and

2014, was 17% (13.3–21.5%), compared with 4.5% of non-Indigenous adults. Indigenous adults were four times more likely to experience racism than their non-Indigenous counterparts (OR = 4.3; 3.2–5.8). However, compared with the largely white non-Indigenous population of Anglo-Celtic origin, Indigenous adults were seven times more likely to experience racism (OR = 7.2; 5.3–9.7) as only 2.8% of Anglo-Celtic adults reported that they had experienced discrimination or been treated unfairly because of their racial, ethnic, cultural, or religious background. We expect that the estimate of 2.8% is likely to be an overestimate because some of these experiences of discrimination may have been due to religious background rather than race, ethnicity or culture.

Although we know that non-Indigenous adults of non-Anglo-Celtic origin also experience racism, our interest was specifically in the Indigenous experience of racism

Table 4 Impact of socio-demographic characteristics, lifestyle risk factors, and social capital on the association between perceived racism and Indigenous status; bivariable and multivariable analyses

Secondary independent variables	Adjusted Odds Ratio (OR)					% change from crude OR
	Non-Indigenous	Indigenous		p value		
		Adjusted OR	95% confidence interval			
Socio-demographic characteristics	1.0	3.5	2.5	4.8	<0.001	19%
Age	1.0	3.3	2.5	4.5	<0.001	23%
Sex	1.0	4.3	3.2	5.8	<0.001	0%
Geographic residence	1.0	4.5	3.3	6.0	<0.001	-3%
Socioeconomic status	1.0	4.5	3.3	6.0	<0.001	-3%
Total annual household income	1.0	4.4	3.3	5.9	<0.001	-2%
Highest level of education	1.0	4.8	3.6	6.5	<0.001	-11%
Employment status	1.0	4.1	3.0	5.5	<0.001	5%
Lifestyle risk factors	1.0	3.9	2.9	5.2	<0.001	10%
Smoking	1.0	3.9	2.9	5.3	<0.001	8%
Did not consume alcohol in past 12 months	1.0	4.2	3.2	5.7	<0.001	2%
Typical quantity of alcohol consumption	1.0	4.1	3.0	5.4	<0.001	6%
Obesity	1.0	4.2	3.2	5.7	<0.001	2%
Inadequate physical activity	1.0	4.4	3.3	6.0	<0.001	-3%
Social support	1.0	3.9	2.9	5.3	<0.001	9%
Inability to get help from family	1.0	4.0	3.0	5.3	<0.001	8%
Inability to get help from friends	1.0	4.1	3.1	5.6	<0.001	4%
Inability to get help from neighbours	1.0	4.1	3.1	5.5	<0.001	5%
Social and civic trust	1.0	3.7	2.7	5.0	<0.001	15%
Don't believe most people can be trusted	1.0	3.8	2.8	5.1	<0.001	12%
Don't feel safe walking alone down street after dark	1.0	4.4	3.3	5.9	<0.001	-2%
Don't feel valued by society	1.0	4.1	3.0	5.5	<0.001	5%
Don't feel there are opportunities to have real say	1.0	4.1	3.0	5.5	<0.001	6%
Multivariable model 1 ^a	1.0	3.0	2.2	4.3	<0.001	29%
Multivariable model 2 ^b	1.0	3.4	2.5	4.7	<0.001	21%
Multivariable model 3 ^c	1.0	3.2	2.3	4.5	<0.001	26%

Dependent variable = experienced racism: crude odds ratio = 4.3 (95% CI: 3.1-5.8)

^aIncludes all secondary independent variables

^bIncludes secondary independent variables that changed the crude OR by 10% or more: age, education and one social trust indicator

^cIncludes the social determinants and excludes lifestyle risk factors

Bolding indicates that p value is significant at the p <0.05 level

because of the enormous health inequities that exist between Indigenous and non-Indigenous adults. Whereas, the non-Indigenous non-Anglo-Celtic tend to be recent migrants who have better health than those born in Australia; commonly referred to as 'the healthy immigrant effect' [15].

To the best of our knowledge, we believe this study to be the first population-based study of experiences of racism among Indigenous adults who live in the state of Victoria.

However, we believe that our estimate of experiences of racism among Indigenous Victorians is a significant underestimate of the true prevalence of racism and that the estimate of 17% should be taken as meaning 'at least' 17%. We say this for the following reasons. Firstly,

Indigenous status was determined by a simple single-item that asked, "Are you of Aboriginal or Torres Islander origin". Some people may say yes to this question because they have a distant relative who was/is Indigenous, but they personally do not identify as Indigenous and may not 'look' Indigenous, given that there remains a widespread erroneous belief that indigeneity is about skin colour. Therefore, these individuals may not be at risk of experiencing racism due to their self-reported Indigenous origin. We have no way of distinguishing or quantifying such participants. If they made up a significant proportion of the Indigenous sample, then the prevalence of experiences of racism would be significantly underestimated. Indigeneity in Australia

is generally determined by a three-part definition that must be met to be legally considered to be Indigenous. A person must have Indigenous heritage, identify as Indigenous and be accepted as such by an Indigenous community [16].

Secondly, the wider literature consistently shows that experiences of racism are typically under-reported [17]. Studies show that people are more likely to report experiences of racism if the question is phrased to ask about the experiences of the ethnoracial group to which they belong, rather than their personal experiences [17–19]. Evidence suggests this may be due to the psychologically protective effect associated with minimising personal experiences of racism [20, 21]. The Victorian Population Health Survey only inquired about a participant's personal experiences of racism.

Thirdly, multi-item measures of experiences of racism tend to be more reliable than single-item measures [22]. For example, the 2014–15 National Aboriginal and Torres Strait Islander Social Survey, a population-based national survey that used a multi-item measure of experiences of racism, reported that 34% of Indigenous Australians experienced racism [23]. By contrast, the Victorian Population Health Survey only used a single-item measure.

It is important to be cognisant of the fact that racism is a complex phenomenon and reducing it to a single-item question cannot capture its complexity [24]. Indeed, its prevalence is highly likely to be underestimated when using a single-item question. Moreover, Indigenous people view racism as a more diverse and complex phenomenon than non-Indigenous people [25].

It is also well-known that survey questions developed for one culture may not be culturally appropriate for another culture. In recognition of this and the complexity of the phenomenon of racism, Paradies and Cunningham (2008) developed, tested and validated a 31-item Measure of Indigenous Racism Experiences (MIRE) to assess experiences of racism among Indigenous Australians [25]. Future research on the prevalence of experiences of racism among Indigenous Australians will likely be more accurate if it utilised the MIRE questions.

In 2011, the Localities Embracing and Accepting Diversity (LEAD) survey, conducted in Victoria, reported that 97% of Indigenous participants experienced racism [26]. The purpose of the LEAD study was not to specifically measure the prevalence of racism, but to investigate the relationship between experiences of racism and mental health outcomes. As a result, this study was not population representative of Victoria, as it was conducted in only four localities of Victoria and recruitment was non-random to maximise recruitment. However, as this study was conducted among specific Indigenous communities who met the three-part definition of indigeneity and almost all participants had experienced racism, its findings support our contention that our

estimate is an underestimate of the true prevalence of racism experienced by Indigenous Victorians.

The time period of exposure to racism is also of importance. Our study asked about the previous 12 months while another study inquired about the lifetime prevalence of exposure to racism and estimated that 52.3% of Indigenous urban Victorians aged 12–17 years experienced racism [5].

Whether the prevalence of experiences of racism is higher or lower in Victoria compared with other states is currently unknown. However, we hypothesise that there may be a higher prevalence of experiences of racism in Victoria because Victoria has the lowest ethnic density (0.9%) of Indigenous Australians than any other state and there are only two discrete Indigenous communities in Victoria, which have small populations [27]. High own group ethnic density has consistently been shown to be protective against experiences of racism, believed to be due, at least in part, to a lower exposure to the perpetrators of racism [28–30].

Controlling for social determinants and lifestyle risk factors attenuated, but did not eliminate, the strong statistical association between experiences of racism and Indigenous status. Indigenous Victorians were still at least three times more likely to experience racism than their non-Indigenous counterparts after controlling for these factors.

The social determinants had a larger impact on the association between experiences of racism and Indigenous status than the lifestyle risk factors. The negligible impact of the lifestyle risk factors refutes the commonly made claim that the racism Indigenous Australians experience is due to their 'poor lifestyle choices', rather than their Indigenous status [7, 31]. This is particularly pertinent when considering alcohol consumption, as there is a commonly held negative stereotype that most Indigenous Australians drink alcohol to excess, often used to justify racism [31]. However, the evidence shows that Indigenous Australians are less likely to consume alcohol than non-Indigenous Australians and we found that Indigenous Victorians who abstained from alcohol consumption were as likely to experience racism as those who drank excessively [32].

Experiences of racism varied by socioeconomic status. Indigenous adults of low socioeconomic status, whether measured by household income, educational attainment or not being in the labour force, were less likely to experience racism than their higher socioeconomic counterparts. The single exception was that those who were unemployed were also more likely to experience racism. Our findings are consistent with the literature. For example, the Darwin Region Urban Indigenous Diabetes (DRUID) study also found a higher prevalence of experiences of racism among Indigenous Australians of high socioeconomic status [33].

A possible explanation of why experiences of racism are higher among Indigenous Australians of higher socioeconomic status may be that those who manage to overcome the substantial barriers that Indigenous people continue to face in mainstream society are a minority within a minority. This is likely to increase an individual's exposure to mainstream society and put them at a greater likelihood of experiencing racism, which is consistent with the evidence on the protective effects of high own group ethnic density. It may also explain the seeming contradiction of unemployed Indigenous Victorians being more likely to experience racism. Unemployed Indigenous Victorians may also have a higher exposure to mainstream society because such exposure is necessary to receive unemployment benefits. Alternatively, or additionally, it is possible that people of higher socioeconomic status have a greater propensity to report experiences of racism.

Our findings that low educational attainment appear to be protective against experiences of racism is of concern given the poorer socioeconomic outcomes associated with low levels of education. There is a large body of research demonstrating the existence of maladaptive problem-focused behavioural responses to racism, such as opting out of formal education as an act of self-protection [34]. This may help to explain the lower secondary school completion rates among Indigenous children and is supported by a recent study in Victoria, which identified racism within the school system as one of the most challenging issues faced by Indigenous children, particularly at secondary school level [35].

The implication of this finding is that more needs to be done to eradicate systemic and interpersonal racism within our education system. In 2012, the Race Discrimination Commissioner observed that: "Sometimes racism can be reflected in not telling the history of an event or the experience of a group of people in our country" [36]. Currently, what is, or is not, taught in schools about Indigenous history and culture, depends on individual schools. Unfortunately, an attempt to introduce a national curriculum, which embedded education about Indigenous culture, history, and the impact of colonisation, was thwarted in 2014 by the Federal government, following a non-independent review of its content [37].

At a societal level, groups who claim ethnoracial superiority at the expense of those deemed inferior, derive great benefits from the inequitable social and economic living conditions that are generated [17]. However, for the group deemed to be inferior, chronic experiences of racism are harmful to their mental and physical health [38–40]. While racism is not always intentional and much of systemic racism is carried out by people who are ignorant or in denial, this doesn't lessen its harmful effects.

According to Krieger's ecosocial analysis, the harm occurs through seven pathways [17]: (1) economic and social deprivation; (2) higher exposure to toxins, hazards, and pathogens; (3) social trauma, (4) health-harming responses to racism, (5) targeted marketing of harmful products; (6) inferior and inadequate health care; and (7) environmental degradation and alienation from the land [22].

Strengths of our study include that it was based on data from the Victorian Population Health Survey, which has been conducted annually since 2001 and is a well-validated population-based survey with a relatively high response rate. Moreover, the Victorian Population Health Survey collects data on a wide breadth of topics, including the social determinants of health, because it was informed by a public health model of the social determinants of health [41]. In contrast, most health surveys tend to be informed by the biomedical model of health, which attributes disease to proximate biological factors at the level of the individual and ignores the social determinants of health. Collecting data on the social determinants of health provides an opportunity to develop policy directions that address racism.

Weaknesses of the study, other than those previously described, include the use of two different questions about experiences of racism. While the questions in the 2011 and 2012 studies ask specifically about experiences of racism directly attributable to Indigenous status, the question in the 2014 survey asked about experiences of racism attributable to 'racial, ethnic, cultural, or religious background'. This leaves open the question of potential intersectionality between race and religion and whether we are accurately measuring experiences of racism among participants from the 2014 survey which would impact on the prevalence estimate of the combined dataset. The prevalence of experiences of racism among Indigenous participants from the 2011 and 2012 surveys was 19.6% (13.8–27.1%) compared with 15.0% (10.7–20.7%) from the 2014 survey. Although lower among the 2014 Indigenous participants, the difference was not statistically significant.

Survey data is cross-sectional, which does not allow for conclusions to be drawn in relation to cause and effect or its direction. For example, feeling unsafe walking alone after dark could be the consequence and/or cause of self-reported racism.

The data is self-reported raising concerns about bias and accuracy. However, not all data readily lends itself to objective measurement, and experiences of racism are an example [34]. However, it is self-reported racism that is strongly associated with mental and physical ill-health [42].

The Victorian Population Health Surveys conducted prior to 2015 only surveyed households with landline telephone connections. Yet the exponential uptake of

mobile telephones has caused a rapid growth in households that rely solely on mobile telephones and raised concerns that telephone surveys that only include fixed landline connections are losing their population representativeness [43]. Moreover, Indigenous women have been found to be five times more likely than non-Indigenous women to live in mobile-only households [43]. Therefore, if the experiences of Indigenous households who have landline telephones are different to those who do not, our findings may not be as population representative as we suppose.

As noted by the extensive work of Maggie Walter, the collection, analysis and interpretation of data on Indigenous peoples are not as objective as non-Indigenous peoples claim them to be [44]. In Australia most research is conceived, conducted and interpreted by non-Indigenous people who are largely of middle class Anglo-Celtic origin. Consequently, the research decisions made reflect the social norms, values and beliefs of the non-Indigenous. This has led to a lot of research that effectively stigmatises Indigenous people, thus reinforcing racism.

For example, there is a disproportionate amount of research that focuses on health behaviours such as smoking and alcohol consumption, comparing Indigenous with non-Indigenous people. Such research concludes that Indigenous people are more likely to engage in unhealthy health behaviours than their non-Indigenous counterparts, which is stigmatising [45]. This has led to policies aimed at closing the gap in health between Indigenous and non-Indigenous Australians being almost exclusively focused on reducing the gap in health behaviours, which is notoriously hard to do in any population. Yet the irony of this is that health behaviours only account for approximately 32% of the total burden of disease and this itself may be an overestimate as it is based on a study that only included health behaviours in the risk factors analysis [46]. It is the social determinants of health that account for a far greater proportion of the burden of disease.

The reasons for this not only reflect the dominance of the biomedical model of health, which was conceived in Europe and the United States, but also Western neoliberal culture that values individualism over collectivism and regards individual responsibility as the pathway to good health. It is at odds with the Indigenous perspective on health. Imposing such beliefs and values through prioritising this type of research is, arguably, racist. We therefore recognise this as a weakness of our study and join the growing call for better engagement with, and the inclusion of, Indigenous people and Indigenous researchers at all stages of the research process, from conception to publication.

Each year the Prime Minister of Australia reports on progress towards closing the gap in Indigenous health.

However, in the 9 years since the commencement of the 'Closing the Gap' strategy, very little has been achieved and in some cases the gap is widening [47]. The National Indigenous and Torres Strait Islander Health Plan 2013–2023, designed to address the gap, acknowledges that "racism is a key social determinant of health for Indigenous and Torres Strait Islander people..." and seeks to eliminate systemic racism within the healthcare sector. However, it still disproportionately focuses on changing the health behaviours of Indigenous Australians and ignores the wider systemic and interpersonal racism directed against Indigenous Australians [48]. We contend that the gap is unlikely to be reduced until we comprehensively address racism towards Indigenous Australians [49].

A large body of work on anti-racism strategies and interventions has been conducted and trialled by the Victorian Health Promotion Foundation [50]. We refer readers to their website [50]. Table 5 attempts to summarise potential policies and interventions, by sector, that may effect real societal change in attitudes and behaviours. The list is not meant to be exhaustive, but rather to provoke thought. Many of the policies and interventions are aimed at eliminating systemic racism rather than interpersonal racism which is the subject of this study. However, all forms of racism ought to be tackled simultaneously to prevent reversion. Moreover, piecemeal approaches to tackling racism that are often underfunded and not sustained have the potential to do more harm than good [51].

In Australia, a paternalistic ideology continues to pervade policy-making for Indigenous Australian across all levels of government [52]. This is, therefore a key area for reform. Paternalistic policies are inherently racist as they do not recognise the right to self-determination and seek to limit the choices of individuals, based on the belief that individuals do not know what is in their best interest. The antithesis of the paternalistic approach is a human rights-based approach. The adoption of a human rights-based approach to policy-making would be more likely to facilitate the elimination of systemic racism which in turn would lead to better health and wellbeing outcomes for Indigenous people.

Conclusions

This study shows that, contrary to the current discourse in Australia that denies the existence of racism, racism directed against Indigenous adults in Victoria is a significant problem and may be associated with lower educational attainment, which may lead to lower socioeconomic status and poorer health outcomes.

Therefore, if as a society we truly wish to reduce the gap in health between Indigenous and non-Indigenous

Table 5 Potential policies and interventions to eradicate racism

Sector	Policies/interventions
Health	<p>Mandatory anti-racism and cultural competency training for all staff in mainstream health services with periodic refresher courses.</p> <p>A surveillance system to monitor treatment in mainstream services by Indigenous status, linked to health outcomes and reported to an independent committee.</p> <p>Expansion of culturally safe Indigenous community controlled health organisations.</p>
Police, courts, and corrective services	<p>Mandatory anti-racism and cultural competency training for all staff with periodic refresher courses.</p> <p>Full implementation of the 339 recommendations of the 1987 Royal Commission into Aboriginal deaths in custody.</p> <p>Properly fund good quality legal services, reinstate and expand Indigenous language translation services.</p> <p>Policies of non-tolerance of racial discrimination with consequences.</p> <p>Increase opportunities for, and active recruitment of Indigenous police officers.</p> <p>Legislation to ban the incarceration of Indigenous people for unpaid fines and other minor offences.</p> <p>Surveillance system to compare Indigenous and non-Indigenous incarceration rates by crime that is routinely reported to an independent committee.</p>
Media	<p>Anti-racism social marketing campaigns.</p> <p>Social marketing campaigns to encourage bystander action in racist incidents.</p> <p>Mandatory anti-racism and cultural competency training for all media staff with periodic refresher courses.</p>
Education	<p>Mandatory anti-racism and cultural competency training for all staff, with periodic refresher courses.</p> <p>Implement a national curriculum that provides for the mandatory teaching of Indigenous culture, history, the impact of colonisation, and the impacts of racism.</p> <p>Increase opportunities for, and active recruitment of Indigenous teachers.</p>
Government and public service	<p>Reinstate the Australian and Torres Strait Islander Commission (ATSIC) or its equivalent and implement the recommendations of the Uluru Statement from the heart.</p> <p>Recognise and openly acknowledge that racism is endemic within our institutions and society, and is a significant health risk factor for Indigenous people.</p> <p>Adopt a human rights-based approach to policy-making for Indigenous Australians.</p> <p>Mandatory anti-racism and cultural competency training for all staff and members of parliament with periodic refresher courses.</p> <p>Properly fund the native title system.</p> <p>Correct reporting of government expenditure on Indigenous-specific services with an active media campaign to dispel the myth of the 'wasted millions'.</p>
Housing	<p>Replace degraded housing stock and provide additional housing to reduce overcrowding.</p>
Institutions	<p>Implement place-based anti-racism interventions such as the Localities Embracing and Accepting Diversity (LEAD) intervention (VicHealth 2014).</p>

Australians, we should: (a) acknowledge that racism against our Indigenous counterparts exists; (b) that it is extensive and harmful; and (c) that it is a major determinant of the gap in health. Moreover, racism directed against Indigenous Australians is a problem that needs to be addressed by the dominant non-Indigenous population through challenging and changing beliefs and behaviours in schools, workplaces, the media, the public sector, government and society at large.

Abbreviations

ABS: Australian Bureau of Statistics; BMI: body mass index; LEAD: The Localities Embracing and Accepting Diversity survey; VicHealth: Victorian Health Promotion Foundation

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Availability of data and materials

The authors do not have permission to release the data. However, the data are available from the Victorian Department of Health and Human Services upon application.

Authors' contributions

AM analysed the data and drafted the article. ZA, DC, and JM provided information, contributed to the draft, read and approved the final version of this article. All authors read and approved the final manuscript.

Ethics approval and consent to participate

The Victorian Department of Health Human Research Ethics Committee approved the survey in accordance with the guidelines of the Declaration of Helsinki. Verbal informed consent was obtained from all survey participants.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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References

- Harris JW. Hiding the bodies: the myth of the humane colonisation of Australia. *Journal of Aboriginal History*. 2003;27:79–104.
- Broome R. *Aboriginal Victorians: A history since 1800*. Crows Nest NSW: Allen & Unwin; 2005.
- AIHW. *Life expectancy of Aboriginal and Torres Strait Islander people*. Australian Institute of Health and Welfare. <http://www.aihw.gov.au/deaths/life-expectancy/#indigenous>. 2016 [cited 2016 15/12].
- Larson A, et al. It's enough to make you sick: the impact of racism on the health of Aboriginal Australians. *Aust N Z J Public Health*. 2007;31(4):322–9.
- Priest N, et al. Racism and health among urban Aboriginal young people. *BMC Public Health*. 2011;11:568.
- Augoustinos M, Every D. The language of "race" and liberal-practical politics. *J Lang Soc Psychol*. 2007;26(2):123–41.
- Sanson A, et al. Racism and prejudice: an Australian Psychological Society position paper. *Aust Psychol*. 1998;33(3):161–82.
- Berman G, Paradies Y. Racism, disadvantage and multiculturalism: towards effective anti-racist praxis. *Ethn Racial Stud*. 2010;33(2):214–32.
- Victorian State Government. *Victorian Population Health Survey*. <https://www2.health.vic.gov.au/public-health/population-health-systems/health-status-of-victorians/survey-data-and-reports/victorian-population-health-survey>.
- ABS, Frequently Asked Questions - Tips for using CURFs - How should I use survey weights in my model? Australian Bureau of Statistics. 2008. <http://www.abs.gov.au/ausstats/abs@nsf/Lookup/3607C2551414E995CA257A5D000F7C5D?opendocument>.
- WHO, *World Health Organization*. http://apps.who.int/bmi/index.jsp?introPage=intro_3.html. 2017.
- Department of Health and Ageing (DoHA). *National physical activity guidelines for adults*. Canberra: DoHA; 1999.
- StataCorp. *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP. Accessed 02-Aug-14. 2011 02-Dec-13; Available from: <http://www.stata.com/>.
- McNamee R. Confounding and confounders. *Occup Environ Med*. 2003; 60(3):227–34 quiz 164, 234.
- Kennedy S, et al. The healthy immigrant effect: patterns and evidence from four countries. *J Int Migr Integr*. 2015;16(2):317–32.
- Parliament of Australia, *Defining Aboriginality in Australia*. Current Issues Brief no. 10 2002–03. 2003.
- Krieger, N., *Discrimination and health inequities*, in Social epidemiology, L.F. Berkman, I. Kawachi, and M.M. Glymour, editors. 2014, Oxford university press: New York, NY. p. 63–125.
- Hausmann LR, et al. Perceived racial discrimination in health care and its association with patients' healthcare experiences: does the measure matter? *Ethn Dis*. 2010;20(1):40–7.
- Taylor, D.M., S.C. Wright, and L.E. Porter, Dimensions of perceived discrimination: the personal/group discrimination discrepancy. in *The psychology of prejudice: the Ontario symposium*, M.P. Zanna and J.M. Olson, Editors. 1994, Erlbaum: Hillsdale, NJ, USA.
- Hodson G, Esses VM. Distancing oneself from negative attributes and the personal/group discrimination discrepancy. *J Exp Soc Psychol*. 2002;38:500–7.
- Ruggiero KM, Taylor DM. Why minority group members perceive or do not perceive the discrimination that confronts them: the role of self-esteem and perceived control. *J Pers Soc Psychol*. 1997;72(2):373–89.
- Krieger N, et al. Experiences of discrimination: validity and reliability of a self-report measure for population health research on racism and health. *Soc Sci Med*. 2005;61(7):1576–96.
- ABS, *Australian Bureau of Statistics*. 4714.0 - *National Aboriginal and Torres Strait Islander Social Survey, 2014–15*. <http://www.abs.gov.au/ausstats/abs@nsf/mf/4714.0>. 2016.
- Paradies Y, Cunningham J. Development and validation of the measure of indigenous racism experiences (MIRE). *Int J Equity Health*. 2008;7:9–19.
- Bodkin-Andrews G, Carlson B. The legacy of racism and Indigenous Australian identity within education. *Race Ethn Educ*. 2016;19(4):784–807.
- Ferdinand A, Paradies Y, Kelahe M. Mental health impacts of racial discrimination in Victorian Aboriginal communities: the localities embracing and accepting diversity (LEAD) experiences of racism survey. Melbourne: The Lowitja Institute; 2012.
- ABS, *Australian Bureau of Statistics*. 3238.0.55.001 - *Estimates of Aboriginal and Torres Strait Islander Australians, June 2011*. <http://www.abs.gov.au/ausstats/abs@nsf/mf/3238.0.55.001>. 2016.
- Becares L, Nazroo J, Stafford M. The buffering effects of ethnic density on experienced racism and health. *Health Place*. 2009;15(3):670–8.
- Das-Munshi J, et al. Understanding the effect of ethnic density on mental health: multi-level investigation of survey data from England. *BMJ*. 2010;341:c5367.
- Jurcik T, et al. Understanding the role of the ethnic density effect: issues of acculturation, discrimination and social support. *Journal of Community Psychology*. 2013;41(6):662–78.
- Pedersen A, et al. Attitudes toward Indigenous Australians: the issue of "special treatment". *Aust Psychol*. 2006;41(2):85–94.
- DoH. *The health and wellbeing of Aboriginal Victorians: Victorian population health survey 2008 supplementary report*, Department of Health. Melbourne: State Government of Victoria; 2011.
- Paradies Y, J C. Experiences of racism among urban Indigenous Australians: findings from the DRUID study. *Ethn Racial Stud*. 2009;32(3):548–73.
- Paradies Y. Defining, conceptualizing and characterizing racism in health research. *Crit Public Health*. 2006;16(2):143–57.
- Priest N, et al. Strengths and challenges for Koori kids, koori kids doing well - exploring aboriginal perspectives on social determinants of aboriginal child health and wellbeing. *Health Soc Rev*. 2012;21:165–79.
- Szoke, H., Australian human rights commission. Racism exists in Australia - are we doing enough to address it? <https://www.humanrights.gov.au/news/speeches/racism-exists-australia-are-we-doing-enough-address-it>. 2012.
- Cullen, S., Teachers warn of 'culture wars' as Christopher Pyne announces back-to-basics curriculum review. *Australian Broadcasting Corporation*. 10 Jan 2014. <http://www.abc.net.au/news/2014-01-10/pyne-calls-for-national-curriculum-to-focus-on-benefits-of-west/5193804>. 2014.
- Paradies Y, et al. Racism as a determinant of health: a systematic review and meta-analysis. *PLoS One*. 2015;10(9):e0138511.
- Schmitt MT, et al. The consequences of perceived discrimination for psychological well-being: a meta-analytic review. *Psychol Bull*. 2014; 140(4):921–48.
- Pascoe EA, Smart Richman L. Perceived discrimination and health: a meta-analytic review. *Psychol Bull*. 2009;135(4):531–54.
- Ansari Z, et al. A public health model of the social determinants of health. *Soz Preventivmed*. 2003;48(4):242–51.
- Paradies Y, et al. Racism as a determinant of health: a systematic review and meta-analysis. *PLoS One*. 2015;10(9):1–48.
- Liu B, et al. Mobile phones are a viable option for surveying young Australian women: a comparison of two telephone survey methods. *BMC Med Res Methodol*. 2011;11:159–64.
- Walter M. The politics of the data: how the Australian statistical indigene is constructed. *International Journal of Critical Indigenous Studies*. 2010;3(2):45–56.
- Bond C.J. A culture of ill health: public health or Aboriginality? *Med J Aust*. 2005;183(1):39–41.
- Begg S, et al. Burden of disease and injury in Australia in the new millennium: measuring health loss from diseases, injuries and risk factors. *Med J Aust*. 2008;188(1):36–40.

47. Commonwealth of Australia, Department of the Prime Minister and Cabinet, Closing the gap Prime Minister's report. 2017. <https://www.pmc.gov.au/resource-centre/indigenous-affairs/closing-gap-prime-ministers-report-2017>.
48. Commonwealth of Australia, *National Aboriginal and Torres Strait Islander Health Plan 2013–2023*. <http://www.health.gov.au/natsihp>. 2013.
49. Markwick A, et al. Perceived racism may partially explain the gap in health between aboriginal and non-Aboriginal Victorians: a cross-sectional population based study. *SSM Popul Health*. 2019;7:010.
50. VicHealth, *Victorian Health Promotion Foundation. Reducing race-based discrimination*. <https://www.vichealth.vic.gov.au/search?category=Reducing%20race-based%20discrimination>. 2017.
51. Greco, T, N. Priest, and Y. Paradies, Review of strategies and resources to address race-based discrimination and support diversity in schools. Victorian Health Promotion Foundation (VicHealth), Carlton, Australia. 2010.
52. Lee VS. Political determinants and Aboriginal and Torres Strait Islander women: don't leave your integrity at the political gate. *J Public Health Policy*. 2017;38:387–93.

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CHAPTER 7: SELF-REPORTED HEALTH STATUS

This chapter includes a peer-reviewed paper that was published in *SSM – Population Health* (attached at end of the chapter).

Markwick, A., Ansari, Z., Clinch, D., and McNeil, J. (2019). "Perceived racism may partially explain the gap in health between Aboriginal and Non-Aboriginal Victorians : a cross-sectional population-based study." *SSM – Population Health* 7: 100310.

7.1 Introduction

Vickery et al (2007) pointed out that the majority of the social determinants of the health and wellbeing of Aboriginal and Torres Strait Islander Australians, identified in the work commissioned by the Cooperative Research Centre for Aboriginal Health in 2004, are associated with racism (Vickery et al. 2007).

The research presented in chapter 5 found that Aboriginal and Torres Strait Islander adults in Victoria have low bridging and linking social capital, that have also been shown to be associated with racism and discrimination. The research presented in chapter 6 found that the prevalence of racism experienced by Aboriginal and Torres Strait Islander adults in Victoria was substantial and that it is associated with low bridging and linking social capital.

Given these findings and that there is a wealth of literature that shows that racism is damaging to health, this study sought to quantify the contribution of racism and other selected social determinants to the gap in self-reported health status between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults in Victoria.

7.2 Aims

The aims of this chapter were to:

1. Determine and quantify the contribution of experiences of racism to the gap in self-reported health status
2. Compare the relative contributions of racism, behavioural risk factors, and socioeconomic status to the gap in self-reported health status

7.3 Summary

Aboriginal and Torres Strait Islander Victorians were almost twice as likely as their non-Aboriginal and Torres Strait Islander counterparts to report being in poor health—OR=1.9 (95% CI: 1.3–2.6).

Variables included in the multivariable logistic regression analysis were age; gender; experiences of racism (also known as perceived racism); total annual household income; smoking status; alcohol consumption; bodyweight status; and physical activity.

Experiences of racism explained 34% of the gap in self-reported health status between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians, followed by: smoking (32%), unhealthy bodyweight (20%), socioeconomic status (15%), excessive consumption of alcohol (13%), and abstinence from alcohol consumption (13%). In contrast, physical inactivity made no contribution. Together, experiences of racism and smoking explained 58% of the gap, indicating that the contribution of racism was largely independent of smoking. All independent variables explained 82% of the gap.

7.4 Conclusions

Racism may be an independent risk factor that explains more than a third of the health gap between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Victorians; equivalent in strength to smoking.

7.5 References

Vickery, J., S. Faulkhead, K. Adams and A. Clarke (2007). "Indigenous insights into oral history, social determinants and decolonisation. " Beyond band-aids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Cooperative Research Centre for Aboriginal Health (CRCATH): 19-36. Darwin.

7.6 Publication



Article

Perceived racism may partially explain the gap in health between Aboriginal and non-Aboriginal Victorians: A cross-sectional population based study



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ABSTRACT

Background: There is a persistent gap in the health of Aboriginal Victorians compared with non-Aboriginal Victorians, where Aboriginal Victorians have poorer health. Currently, the most commonly touted explanation for this gap revolves around health behaviours known as 'lifestyle risk factors'. Yet the gap in health is similarly matched by persistent gaps in social and economic outcomes that reflect past and ongoing discrimination of Aboriginal peoples across Australia. Perceived racism has been implicated as a key determinant of the gap in health between Indigenous and non-Indigenous peoples across the world. We sought to determine the contribution of perceived racism to the gap in health and how this compared with the contribution of lifestyle risk factors and other determinants of health such as socioeconomic status.

Methods: We combined data from 2011, 2012 and 2014 Victorian Population Health Surveys (VPHS) to obtain a sample size of 33,833 Victorian adults, including 387 Aboriginal adults. The VPHS is a population-representative, cross-sectional, computer-assisted telephone interview survey conducted annually. Using logistic regression, poor self-reported health status was the dependent variable and Aboriginal status was the primary independent variable of interest. Secondary independent variables included age, sex, perceived racism, socioeconomic status, and lifestyle risk factors.

Results: Aboriginal Victorians were almost twice as likely as non-Aboriginal Victorians to report poor health; OR = 1.9 (95% confidence interval; 1.3–2.6). Perceived racism explained 34% of the gap in self-reported health status between Aboriginal and non-Aboriginal Victorians, followed by: smoking (32%), unhealthy bodyweight (20%), socioeconomic status (15%), excessive consumption of alcohol (13%), and abstinence from alcohol consumption (13%). In contrast, physical inactivity made no contribution. Together, perceived racism and smoking explained 58% of the gap, while all secondary independent variables explained 82% of the gap.

Conclusions: Perceived racism may be an independent health risk factor that explains more than a third of the health gap between Aboriginal and non-Aboriginal Victorians; equivalent in strength to smoking. The recognised failure of the Australian government's Closing the Gap strategy may be due in part to the failure to consider other determinants of the health gap beyond the lifestyle risk factors, namely racism, which may act to damage health through multiple pathways at multiple points along the causal chain.

Introduction

Aboriginal Australians experience a burden of disease that is more than twice the burden of disease experienced by non-Aboriginal Australians (AIHW, 2016). Attempts to reduce the gap in health between Aboriginal and non-Aboriginal Australians have mainly focussed on the biological determinants of ill-health, ignoring the psychological,

social, cultural, economic and environmental causes of ill-health, consistent with the biomedical model of health (Johnson, 2013). These biological determinants largely consist of health behaviours such as smoking, misuse of alcohol, obesity, physical inactivity and low intake of fruit and vegetables; collectively known as the 'lifestyle risk factors'.

The assumption that it is the lifestyle risk factors that are largely responsible for the gap in health between Aboriginal and non-

Abbreviations: BMI, body mass index; OR, odds ratio; VPHS, Victorian Population Health Survey; 95% CI, 95% confidence interval

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Aboriginal Australians is primarily based on risk factor analyses conducted in the Australian Burden of Disease studies (Vos, Barker, Begg, Stanley, & Lopez, 2009). However, these risk factors analyses only took into consideration the lifestyle risk factors. For example, the 2003 Australian Burden of Disease Study estimated that 49% of the gap in burden of disease between Aboriginal and non-Aboriginal Australians was attributable to 11 lifestyle risk factors such as smoking (17%), high body mass (16%), and physical inactivity (12%) (Vos et al., 2009).

However, risk factor analysis is problematic, as the issue of what is or is not included in the analysis is not minor in terms of policy relevance (Watts & Cairncross, 2012). Omitting important risk factors can lead to overinflating the importance of the risk factors that are included, rendering the analysis flawed and subject to the biomedical fallacy; the error of inferring that disease in populations can be fully explained by risk factors for disease in individuals (Shy, 1997).

The gap in health between Aboriginal and non-Aboriginal Australians is similarly matched by gaps in social and economic outcomes that reflect past and ongoing discrimination towards Aboriginal peoples in Australia. For example, in 2012–13 almost 43% of Aboriginal Australians were in the bottom 20% of equivalised gross weekly household income level compared with 17% of non-Aboriginal Australians (AIHW, 2015). Low socioeconomic status is associated with poor health and socioeconomic gradients can be demonstrated for almost every known health outcome in every population of every country across the world (Marmot, 1999).

When a measure of socioeconomic status was included in a risk factor analysis that sought to explain the gap in life expectancy between Aboriginal and non-Aboriginal people living in the Northern Territory, socioeconomic status explained 42–54% of the gap (Zhao, Wright, Begg, & Guthridge, 2013). A further 14–24% of the gap was explained by smoking, 9–17% by obesity, and 1–7% by alcohol consumption. Therefore, socioeconomic status explained more of the gap than the lifestyle risk factors, demonstrating the importance of how what is or is not included in a risk factor analysis has a significant influence on the conclusions drawn.

In the 10 years since the commencement of the Closing the Gap strategy, the Prime Minister reported to the nation in 2017 that almost no progress has been made in reducing the gap in health between Aboriginal and non-Aboriginal Australians, despite a 9% reduction in the prevalence of smoking (Commonwealth of Australia, 2017). Moreover, cancer rates are increasing, widening the gap in life expectancy, and there has been no narrowing of the gap in employment and education outcomes.

Therefore, the question needs to be asked “Is the almost exclusive focus on lifestyle risk factors an effective approach to improving the health of Aboriginal Australians?” Given the lack of progress over the past nine years, it is hard to answer this question in the affirmative and it is appropriate to consider other explanations of the persistent gap in health between Aboriginal and non-Aboriginal Australians.

There is an abundance of research that implicates racism as a key determinant of the mental and physical health of minority and Indigenous peoples around the world, including Australia (Pascoe & Smart Richman, 2009; Priest et al., 2013; Paradies et al., 2015). The pathways by which racism, directly and indirectly, damages health are complex, multiple, and located at multiple points across the causal pathway.

Racism has been variously defined; we define racism as “... organized systems within societies that cause avoidable and unfair inequalities in power, resources, capacities and opportunities across racial or ethnic groups” (Paradies et al., 2015). Racism can be internalised; whether it is an individual who believes that their ethnic group is superior while other ethnic groups are inferior or vice versa. It can be interpersonal; where the interactions between people serve to maintain or exacerbate the unequal distribution of opportunity and resources across racial or ethnic groups. It can also be structural, often known as systemic or institutional; where a society fosters racial

discrimination through its housing, employment, criminal justice, education, media, social welfare, and health care systems (Paradies, Harris, & Anderson, 2008; Bailey et al., 2017).

There are several indirect pathways by which racism damages health (Paradies et al., 2015). Racism reduces access to employment, housing and education which in turn ensures that those affected are relegated to the lower socioeconomic ranks of society (Dressler, Oths, & Gravlee, 2005). Racism increases exposure to hazardous physical and occupations environments (Clifford, Pearson, Franklin, Walker, & Zosky, 2015; Bailey et al., 2017). Racism increases the uptake of unhealthy behaviours such as smoking, excessive consumption of alcohol and overeating, as a means of coping (Pascoe & Smart Richman, 2009; Ziersch, Gallaher, Baum, & Bentley, 2011). Maternal exposure to racism elicits a physiological stress response that can impact on the uterine environment and epigenetic activity, causing subtle but harmful effects on a foetus that can be maintained into adulthood (Dominguez, Dunkel-Schetter, Glynn, Hobel, & Sandman, 2008; Collins, David, Handler, Wall, & Andes, 2004).

There are also several direct pathways by which racism damages health (Paradies et al., 2015). Repeated and frequent experiences of racism constitute a chronic stressor that overstimulates the body's normal physiologic response to stress where adrenaline is released by the sympathetic nervous system and cortisol is released via the hypothalamic–pituitary–adrenal axis (Smith and Vale, 2006). Chronic stimulation of the hypothalamic–pituitary–adrenal axis causes long-term pathological changes and allostatic load, increasing premature morbidity and mortality from chronic diseases (Berger & Samyay, 2015; Chae et al., 2016). Racism causes adverse cognitive and emotional responses that are associated with psychopathology, such as depression and anxiety (Paradies & Cunningham, 2012). Racism can result in physical injury as a result of racially-motivated violence. Institutional racism within the health care system reduces access to and quality of health care and this has been well-documented in Australia where Aboriginal people often do not receive the same quality healthcare as their non-Aboriginal counterparts (Henry, Houston, & Mooney, 2004; Moore et al., 2014).

Since it is difficult to measure racism objectively, most of the evidence on racism and its impacts on health has relied on self-reported racism, also referred to as ‘perceived racism’. We too relied on self-reported racism, also known as ‘perceived racism’.

We sought to expand the investigation of the gap in health between Aboriginal and non-Aboriginal adults beyond the current focus on lifestyle risk factors. Our aim was (a) to determine and quantify the contribution of perceived racism to the gap in self-reported health between Aboriginal and non-Aboriginal adults living in the Australian state of Victoria, and (b) to compare the relative contributions of perceived racism, lifestyle risk factors and socioeconomic status to the health gap.

For ease of reading, but not to take away from the distinct ethnic identities, we use the term ‘Aboriginal’ to refer to both Aboriginal and Torres Strait Islander Victorians.

Methods

Data source

We combined data from three Victorian Population Health Surveys (VPHS) conducted in 2011, 2012 and 2014, in order to attain a large enough sample of Aboriginal participants.

Study design

The VPHS is a cross-sectional population-based survey conducted annually to provide information on the health and wellbeing of Victorians (Victorian State Government, 2017). Adults aged 18 years or older who live in private dwellings across the state of Victoria were

randomly selected using random digit dialling of landline telephones.

Sample size

We merged three datasets from the 2011 survey (33,673 participants), the 2012 survey (7533 participants), and the 2014 survey (33,654 participants). The sample size of the 2011 and 2014 surveys was based on recruiting approximately 426 participants per local government area, of which there are 79 in Victoria. The 2012 survey sample size was based on recruiting approximately 900 participants per departmental region, of which there are 8 in Victoria. The sample size assumed a prevalence of 7.5% for a variable of interest, with a confidence interval of 5,10% and an alpha of 5.0%.

We excluded all non-Aboriginal participants from the 2011 and 2012 surveys because they were not asked about experiences of racism. The combined dataset was stratified by departmental region of which there are eight in Victoria. The final sample size was 33,833, including 387 Aboriginal participants.

Response rate

The response rate, defined as the proportion of households where contact was made and an interview completed, was 67% for the 2011 survey, 69% for the 2012 survey, and 70% for the 2014 survey.

Weighting

In order to control for participation bias, we reweighted the survey data to reflect the age/sex/geographic distribution of the census Aboriginal and non-Aboriginal resident population of Victoria in 2011 and to account for the probability of selection of the household and participant within the household (Department of Health and Human Services, 2016). We then normalised the resulting weights to add up to the sample total in order to maximise the accuracy of the standard errors (ABS, 2008).

Ethics statement

The Victorian Department of Health Human Research Ethics Committee approved the survey in accordance with the guidelines of the Declaration of Helsinki.

Dependent and primary independent variables of interest

Our dependent variable was self-reported health status and all survey participants were asked to indicate whether they would describe their overall health status as excellent, very good, good, fair or poor. Our primary independent variable of interest was Aboriginal status and all survey participants were asked "Are you of Aboriginal or Torres Strait Islander origin?" Participants who stated that they were Aboriginal ($n = 328$), Torres Strait Islander ($n = 39$) or both ($n = 20$) were combined.

Secondary independent variables of interest

Perceived racism was assessed by asking all Aboriginal participants in the 2011 and 2012 surveys: "How often, if at all, have you received unfair treatment in the last 12 months because you are an Aboriginal or Torres Strait Islander?" Participants of the 2014 survey were asked: "In the last 12 months, have you experienced discrimination or been treated unfairly because of your racial, ethnic, cultural, or religious background?" Although the questions were not identical, we combined the three studies in order to attain a sufficient sample size of Aboriginal participants on the premise that both questions were reasonable measures of perceived racism.

Socioeconomic status was measured by determining the total annual

household income of survey participants, which included pre-tax income from all sources such as wages, social security payments, child support, and investments over the previous 12 months.

The lifestyle risk factors that we examined included smoking, alcohol consumption, bodyweight, and physical activity. After inquiring about the frequency and typical number of standard alcoholic drinks consumed during a typical occasion of alcohol consumption, we derived a composite variable of alcohol consumption that reflected both frequency and volume of consumption (Table 2). We determined a participant's bodyweight status by calculating their body mass index (BMI) from their self-reported height and weight using the formula: $BMI = \text{bodyweight} / (\text{height}^2)$. A participant was judged to be underweight if their BMI was less than 18.5 kg/m^2 , normal weight if $BMI = 18.5\text{--}24.99 \text{ kg/m}^2$, overweight if $BMI 25.0\text{--}29.99 \text{ kg/m}^2$, or obese if $BMI \geq 30 \text{ kg/m}^2$ (WHO, 2017). Participant were asked a series of questions about physical activity and their level of physical activity was determined according to the 1999 National Physical Activity Guidelines for Australians (Department of Health and Human Services, 2016; DoHA, 1999).

Missing data

Less than 5% of participants refused to answer or were unable to answer the survey questions for all variables; with the exception of, total annual household income (17%), bodyweight status (10%), and physical activity level (7%).

Statistical analysis

We computed weighted prevalence estimates for all variables with 95% confidence intervals and calculated relative standard errors to determine the relative size of the sampling error. Where a relative standard error exceeded 25%, we deemed the estimate to be unreliable.

We used logistic regression to investigate the relationship between self-reported health and Aboriginal status. The dependent or outcome variable was poor self-reported health (0 = no and 1 = yes) and the primary independent or exposure variable of interest was Aboriginal status (1 = non-Aboriginal, 2 = Aboriginal and 9999 = did not know or refused to say). We determined statistical significance at the $p < 0.05$ level.

We analysed the survey data using the Stata statistical software package version 12 (StataCorp., 2011), using the following steps:

1. Univariable logistic regression to identify independent variables that were associated with self-reported health (Tables 1 and 2).
2. Bivariable logistic regression to investigate the impact of each secondary independent variable on the association between self-reported health and the primary independent variable of interest; Aboriginal status (Table 3). We estimated the extent to which a secondary independent variable explained the higher prevalence of poor self-reported health among Aboriginal adults in terms of the percentage reduction in the odds ratio (OR) for self-reported health comparing models with and without the proposed mediator (i.e., % reduction = $[(OR_{\text{wo/mediators}} - OR_{\text{w/mediator}}) / (OR_{\text{wo/mediators}} - 1)] \times 100$) (Seeman et al., 2004).
3. Multivariable logistic regression to further investigate the impact of all secondary independent variables (Table 3).

Results

Table 1 shows that Aboriginal adults in Victoria were almost twice as likely as their non-Aboriginal counterparts to report being in poor health; an OR of 1.9 (95% confidence interval (CI); 1.3–2.6).

The proportion of adults who reported being in poor health did not differ between the sexes, however, adults aged 25 years or older were twice as likely as adults aged 18–24 years to report being in poor

Table 1
Poor self-reported health by socio-demographic characteristic and perceived racism: univariable analysis.

Independent variable	n*	% weighted prevalence of poor self-reported health	Crude OR (95% CI)	p-value
Aboriginal status				
Non-Aboriginal	1718	5.0	(4.7–5.2)	1.0
Aboriginal	41	8.9	(6.5–12.1)	1.9
Did not know or refused to say	10	9.6	(5.0–17.5)	2.0
Age (years)				
18–24	20	2.3	(1.5–3.6)	1.0
25–34	61	5.0	(3.9–6.6)	2.2
35–44	167	4.5	(3.8–5.3)	2.0
45–54	286	4.6	(4.1–5.3)	2.0
55–64	432	5.3	(4.8–5.9)	2.3
65+	803	5.3	(4.9–5.7)	2.3
Sex				
Male	700	5.0	(4.7–5.4)	1.0
Female	1069	5.0	(4.7–5.3)	1.0
Perceived racism				
Never	1613	4.8	(4.6–5.1)	1.0
At least yearly	93	7.1	(5.7–8.7)	1.5
At least monthly	46	11.2	(6.6–18.2)	3.0
Did not know or refused to say	17	11.5	(7.1–18.1)	2.6
Socioeconomic status**				
\$100,000 or more	129	2.3	(1.9–2.8)	1.0
\$60,000–\$99,999	155	2.9	(2.4–3.4)	1.3
\$40,000–\$59,999	186	4.2	(3.6–4.9)	1.9
\$20,000–\$39,999	525	6.6	(6.0–7.2)	3.0
Less than \$20,000	441	10.5	(9.5–11.5)	5.0
Did not know or refused to say	335	5.7	(5.1–6.4)	2.6

95% CI = 95% confidence interval; OR = odds ratio.

* n = raw unweighted sample size; however, prevalence and OR are based on weighted data.

** Socioeconomic status was measured by total annual household income.

health.

The proportion of adults who reported being in poor health was significantly higher among those who reported experiencing racism and this increased with the frequency of experiences of racism. Adults who reported experiencing racism at least once a month were three times more likely to report being in poor health than those who did not report

experiencing racism (OR = 3.0; 2.1–4.2) and almost 1.5 times more likely when they experienced racism less than once a month (OR = 1.5; 1.2–1.9).

The proportion of adults who reported being in poor health was inversely related to total annual household income; the lower the household income the higher the proportion of adults in poor health.

Table 2
Poor self-reported health by lifestyle risk factors: univariable analysis.

Independent variable	n*	% weighted prevalence of poor self-reported health	Crude OR (95% CI)	p-value
Smoking status				
Non-smoker	726	3.8	(3.5–4.1)	1.0
Ex-smoker	646	5.8	(5.3–6.3)	1.6
Current smoker	385	9.2	(8.3–10.2)	2.6
Did not know or refused to say	12	3.9	(2.1–7.2)	1.0
Consumption of alcohol				
1–2 drinks, 3–6 days a week or less	935	3.7	(3.5–4.0)	1.0
3–4 standard drinks every day	58	5.2	(3.9–6.8)	1.4
5+ drinks, 3–6 days per week or every day	66	7.0	(5.4–9.1)	1.9
Abstainer	673	8.7	(8.0–9.4)	2.4
Did not know or refused to say	37	9.2	(6.6–12.7)	2.6
Bodyweight status				
Normal	371	3.0	(2.7–3.3)	1.0
Underweight	59	10.7	(8.2–13.9)	3.9
Overweight	449	3.8	(3.5–4.2)	1.3
Obese	682	9.0	(8.3–9.7)	3.2
Did not know or refused to say	208	6.3	(5.4–7.2)	2.2
Physical activity				
Adequate physical activity	416	2.8	(2.5–3.1)	1.0
Inadequate physical activity	849	5.4	(5.1–5.8)	2.0
Sedentary	258	14.1	(12.4–15.9)	5.7
Did not know or refused to say	246	9.5	(8.3–10.8)	3.7

95% CI = 95% confidence interval; OR = odds ratio.

* n = raw unweighted sample size; however, prevalence and odds ratio estimates are based on weighted data.

Table 3

Impact of socio-demographic characteristics, perceived racism and lifestyle risk factors on the association between poor self-reported health and Aboriginal status: bivariable and multivariable analyses.

Secondary independent variable	Adjusted Odds Ratio (OR) ^a (95% CI)				% change from base model ^b
	Non-Aboriginal	Aboriginal	p-value		
Age	1.0	2.0	(1.4–2.8)	< 0.001	-12%
Sex	1.0	1.9	(1.3–2.6)	< 0.001	0%
Perceived racism	1.0	1.6	(1.1–2.3)	0.013	34%
Socioeconomic status	1.0	1.7	(1.2–2.5)	0.002	15%
Smoking	1.0	1.6	(1.1–2.3)	0.009	32%
Excessive alcohol consumption	1.0	1.8	(1.1–2.8)	0.018	13%
Abstinence from alcohol consumption	1.0	1.8	(1.2–2.5)	0.002	13%
Unhealthy bodyweight status	1.0	1.7	(1.2–2.4)	0.003	20%
Physical inactivity	1.0	1.9	(1.3–2.7)	0.001	0%
All secondary independent variables	1.0	1.2	(0.7–1.9)	0.569	82%
Variables that changed the OR of the base model by 20% or more^c	1.0	1.2	(0.9–1.8)	0.257	72%
Variables that changed the OR of the base model by 30% or more^d	1.0	1.4	(0.9–2.0)	0.096	58%

^a Crude odds ratio = 1.9 (95% confidence interval (CI): 1.3–2.6).

^b % change from base model = (crude OR – adjusted OR) / (crude OR – 1) × 100.

^c Includes perceived racism, smoking status, and bodyweight status.

^d Includes perceived racism and smoking status.

Current and ex-smokers, adults of unhealthy weight (underweight, overweight or obese), and those who were physically inactive were also more likely to report being in poor health than non-smokers, adults of normal bodyweight, and the physically active, respectively (Table 2).

There appeared to be a u-shaped relationship between consumption of alcohol and poor self-reported health. Adults who abstained from alcohol consumption and those who typically consumed more alcohol than is currently recommended were both more likely to report being in poor health than adults who consumed alcohol within the recommended guidelines of no more than 2 standard drinks every day (NHMRC, 2009). From a policy perspective, one would not use such data to suggest that adults be encouraged to consume alcohol within the recommended guidelines if they did not drink any alcohol. Therefore, in order to separate out the two different associations, we derived two new variables; one for abstinence from alcohol and one for excessive consumption of alcohol to be used in the bivariable and multivariable analyses.

Table 3 shows that when secondary independent variables were included in the model, the variable that made the largest contribution to explaining the health gap between Aboriginal and non-Aboriginal

adults in Victoria was perceived racism (Fig. 1). Perceived racism reduced the association between poor self-reported health and Aboriginal status by 34%, followed by smoking (32%), unhealthy bodyweight (20%), total annual household income (15%), excessive consumption of alcohol (13%), and abstinence from alcohol consumption (13%), while physical inactivity and sex made no impact. In contrast, age increased the odds ratio by 12%, suggesting that the association between poor self-reported health and Aboriginal status was masked or underestimated until differences in the relative age structures of Aboriginal and non-Aboriginal adults were taken into account.

When we included all secondary independent variables in the model, 82% of the gap in self-reported health between Aboriginal and non-Aboriginal adults was explained. Looking at the two variables that made the largest individual contributions, when put in the model together, perceived racism and smoking explained 58% of the health gap.

Discussion

We found that Aboriginal adults in Victoria were almost twice as likely as their non-Aboriginal counterparts to report being in poor

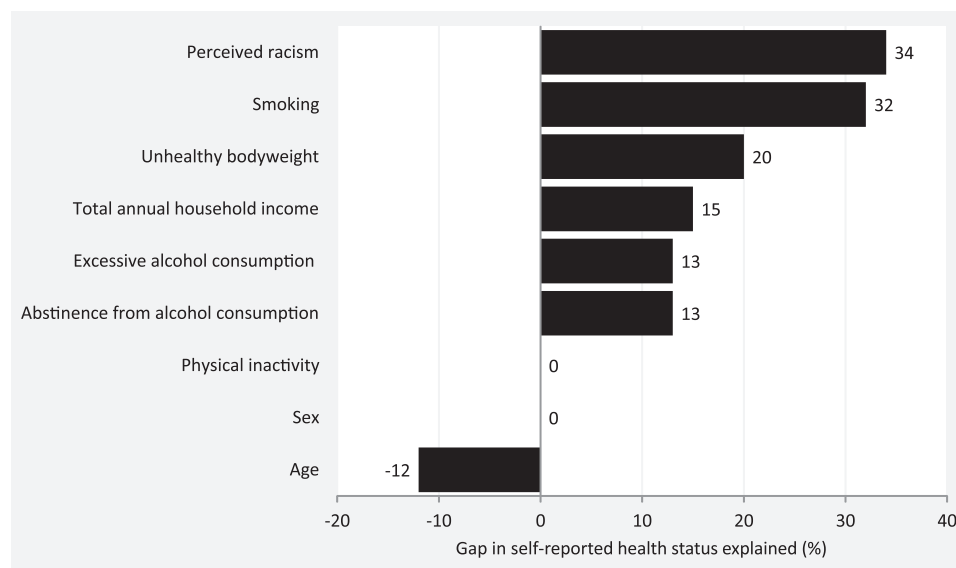


Fig. 1. The relative contribution of the individual secondary variables to the higher prevalence of poor self-reported among Aboriginal compared with non-Aboriginal adults in Victoria.

health. We refer to this in the rest of the discussion as ‘the health gap’. Self-reported health status is a widely used reliable indicator of an individual’s overall health status that has been validated in multiple studies across the world and shown to be an excellent predictor of both morbidity and mortality (Idler & Benyamini, 1997; Manor, Matthews, & Power, 2001; Schnittker & Bacak, 2014; Perez-Zepeda et al., 2016).

We sought to explain the health gap using multivariable logistic regression and hypothesised that each of the secondary independent variables of interest was a potential mediator of the association between Aboriginal status and self-reported health, with the exception of age and sex which we considered to be potential confounders. It is mathematically impossible to distinguish a potential mediator from a potential confounder and so the distinction is dependent upon extra-statistical reasoning (Babyak, 2009). It should be noted at this point that we use the term ‘potential’ deliberately because a key weakness of our study is that the data is cross-sectional. Cross-sectional data cannot be used to determine causality and its direction. However, there is consensus in the literature that smoking causes ill-health and a growing consensus that perceived racism also causes ill-health. Moreover, logic would dictate that if perceived racism and smoking potentially mediate the relationship between poor health and Aboriginal status, then it would be in the direction of causing ill-health rather than causing one’s Aboriginal status.

The two independent variables that made the greatest contribution to explaining the health gap were perceived racism and smoking. Perceived racism explained 34% of the health gap, while smoking explained 32% of the health gap. When perceived racism and smoking were included in the same model, they explained 58% of the health gap. Therefore, the potential effect of perceived racism on health was largely independent of smoking, although we did observe (data not shown) that survey respondents who experienced racism at least once a year were almost twice as likely to smoke as those who never experienced racism (OR = 1.7; 1.4–1.9).

Given that perceived racism is likely to primarily reflect interpersonal experiences of racism, we hypothesise that perceived racism potentially acts as a proximate determinant of health through its action as a psychosocial stressor and therefore constitutes a health risk factor that is comparable to the health risk factor of smoking. However, this does not preclude the potential concomitant role of racism as a distal determinant of health and this is supported by a plethora of evidence in the literature that shows that racism may damage health via multiple pathways located at multiple points along the causal chain (Williams & Mohammed, 2013). We also hypothesise that the distal effects of racism are more likely to reflect structural racism that is not necessarily perceived by the individual and therefore unlikely to have been captured in our data.

Our findings regarding the consumption of alcohol are conflicting; both excessive and zero consumption of alcohol appear to partially explain the health gap. While there is consensus that excessive consumption of alcohol is harmful to health, there is also consensus that light to moderate consumption of alcohol confers a lower risk of cardiovascular disease and death (Gronbaek, 2009). Our findings may simply reflect the j-shaped relationship between alcohol consumption and health, and/or reflect that there may be a proportion of abstainers who abstained from alcohol consumption due to health reasons.

Negative stereotypes about Aboriginal Australians that fuel racism often centre around the misuse of alcohol. Yet the national data consistently show that Aboriginal people across Australia are less likely to consume alcohol than their non-Aboriginal counterparts (Wilson, Stearne, Gray, & Siggers, 2010). However, there is also evidence that Aboriginal people who do consume alcohol are more likely to do so to excess than non-Aboriginal Australians (Wilson et al., 2010). As with smoking, experiences of racism have been repeatedly shown to be associated with excessive consumption of alcohol as a coping mechanism (Shariff-Marco, Klassen, & Bowie, 2010).

Strengths of the study include that it was based on data from the Victorian Population Health Survey; a well-validated, population-based survey, with a relatively high response rate that was informed by a public health model of the social determinants of health (Ansari, Carson, Ackland, Vaughan, & Serraglio, 2003).

Weaknesses include that survey data is cross-sectional, which does not allow for assertions to be made about causality or its direction. Secondly, while combining datasets is a way of increasing precision, it is unclear if it creates bias, particularly since we had to exclude all non-Aboriginal participants from the 2011 and 2012 surveys because they were not asked about experiences of racism.

Thirdly, the data were self-reported which raises concern about accuracy. However, not all data readily lends itself to objective measurement such as experiences of racism (Paradies, 2006). Moreover, the literature suggests perceived racism is likely to be under-estimated due to cognitive biases such as social desirability bias, in addition to the well-known psychologically protective effect associated with minimising personal experiences of racism (Bailey et al., 2017; Hodson & Esses, 2002; Ruggiero & Taylor, 1997). Under-estimating exposure to racism is likely to lead to the under-estimation of the magnitude of association between racism and its impact on health. We previously reported that 17.0% (13.3–21.5%) of Aboriginal adults in Victoria, based on the same dataset, experienced at least one episode of racism in the 12 months prior to the survey (Markwick, Ansari, Clinch, & McNeil, Submitted for publication). This is in contrast to a national population-representative study that reported that 33% of Aboriginal Australians experienced racism during a similar time period as well as a survey of four localities in Victoria where 95% of Aboriginal participants experienced racism (ABS, 2016) (Ferdinand, Paradies, & Kelaher, 2012). Therefore, our findings are likely to be highly conservative and it is possible that perceived racism potentially explains more of the health gap than we have been able to demonstrate here.

We have shown that perceived racism explains more than one-third of the gap in health between Aboriginal and non-Aboriginal adults in Victoria; comparable to and independent of smoking. The literature shows that the health-harming effects of racism may be multiple and located at multiple points along the causal pathway; placing it in a pivotal position as a key determinant of the health gap between Indigenous and non-Indigenous peoples across the world. However, there is an ongoing reluctance to acknowledge the existence of racism and its harmful effects, both in Australia and across the world (Augoustinos and Every, 2007) (Bailey et al., 2017).

Past and current government policies that seek to close the gap in health between Aboriginal and non-Aboriginal Australians continue to favour initiatives that focus on addressing a narrow range of proximate health risk factors, namely the lifestyle risk factors of smoking, alcohol consumption, diet and physical activity (Commonwealth of Australia, 2013). This may be due, in part, to the dominance of the biomedical model of health which is underpinned by the dominant Western neoliberal cultural philosophy that values individualism over collectivism and sees individual responsibility as the pathway to good health. This arguably could be described as another form of racism where the Western biomedical model of health reduces the Aboriginal identity to a series of health problems that need ‘fixing’, ignoring the Aboriginal concept of health. The Aboriginal concept of health is where health is not just the physical well-being of an individual, but includes the social, emotional and cultural well-being of the individual and the whole Community (NACCHO, 2017).

Policies that focus on reducing the prevalence of lifestyle risk factors have not only failed to reduce the health gap, but it has been argued that these policies are stigmatising, thus reinforcing negative stereotypes and perpetuating racism, which in turn may further damage health (Bond, 2005). Moreover a Cochrane systematic review of the effectiveness of interventions to reduce the prevalence of lifestyle risk factors in various populations across the world, concluded that health

promotion interventions have met with limited success, and often modest improvements are not sustained in the long-term (Ebrahim and Smith, 1997).

Therefore the failure of the Closing the Gap strategy may be due in part to the failure to consider other potentially more important determinants of the health gap, such as racism, as well as the relative lack of effectiveness of current approaches to promote behavioural change at the level of the individual. To that effect, it is time to reconsider the strategies for reducing the health gap between Aboriginal and non-Aboriginal Australians.

We conclude that our work provides evidence that racism may act as an important proximate determinant of the health gap between Aboriginal and non-Aboriginal people in Victoria, comparable to smoking. Moreover, the literature shows that institutional racism, which is pervasive across multiple organisations and sectors such as health care, criminal justice, education, housing, employment, and the media, is a distal and proximate determinant of health. Thus racism may play a pivotal role in damaging the health of Aboriginal people in Victoria.

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Declarations of interest

None.

Appendix A

<https://www2.health.vic.gov.au/public-health/population-health-systems/health-status-of-victorians/guides-and-resources>.

References

- ABS (2008). Frequently Asked Questions - Tips for using CURFs - How should I use survey weights in my model? *Australian Bureau of Statistics*. <http://www.abs.gov.au/websitedbs/D3310114.nsf/4a256353001af3ed4b2562bb00121564/d4b021fd647c719cca257362001e13dc1OpenDocument>.
- ABS (2016). Australian Bureau of Statistics. 4714.0 - National Aboriginal and Torres Strait Islander Social Survey, 2014–2015. <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4714.0>.
- AIHW (2015). *Aboriginal and Torres Strait Islander health performance framework 2014 report: Victoria. Cat. no. IHW 160*. Canberra: Australian Institute of Health and Welfare.
- AIHW (2016). *Australian burden of disease study: Impact and causes of illness and death in Aboriginal and Torres Strait Islander people 2011. Australian burden of disease study series no. 6. Cat. no. BOD 7*. Canberra: Australian Institute of Health and Welfare.
- Ansari, Z., Carson, N. J., Ackland, M. J., Vaughan, L., & Serraglio, A. (2003). A public health model of the social determinants of health. *Soz Praventivmed*, 48, 242–251.
- Augoustinos, M., & Every, D. (2007). The language of “race” and liberal-practical politics. *Journal of Language and Social Psychology*, 26, 123–141.
- Babiyak, M. A. (2009). Understanding confounding and mediation. *Evidence Based Mental Health*, 12, 68–71.
- Bailey, Z. D., Krieger, N., Agenor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: Evidence and interventions. *Lancet*, 389, 1453–1463.
- Berger, M., & Saranyai, Z. (2015). “More than skin deep”: Stress neurobiology and mental health consequences of racial discrimination. *Stress*, 18, 1–10.
- Bond, C. J. (2005). A culture of ill health: Public health or Aboriginality? *Medical Journal of Australia*, 183(1), 39–41.
- Chae, D. H., Epel, E. S., Nuru-Jeter, A. M., Lincoln, K. D., Taylor, R. J., Lin, J., Blackburn, E. H., & Thomas, S. B. (2016). Discrimination, mental health, and leukocyte telomere length among African American men. *Psychoneuroendocrinology*, 63, 10–16.
- Clifford, H., Pearson, G., Franklin, P., Walker, R., & Zosky, G. (2015). Environmental health challenges in remote Aboriginal Australian communities: Clean air, clean water and safe housing. *Australian Indigenous Health Bulletin*, 15, 1–13.
- Collins, J. W., Jr., David, R. J., Handler, A., Wall, S., & Andes, S. (2004). Very low birthweight in African American infants: The role of maternal exposure to interpersonal racial discrimination. *American Journal of Public Health*, 94, 2132–2138.
- Commonwealth of Australia (2013). National Aboriginal and Torres Strait Islander health plan 2013–2023. <http://www.health.gov.au/natsihp>.
- Commonwealth of Australia (2017). Department of the Prime Minister and Cabinet, *Closing the gap Prime Minister's report 2017*. <http://closingthegap.pmc.gov.au/sites/default/files/ctg-report-2017.pdf>.
- Department of Health and Human Services (2016). Victorian Population Health Survey 2014: Modifiable risk factors contributing to chronic disease, State Government of Victoria, Melbourne. <https://www2.health.vic.gov.au/public-health/population-health-systems/health-status-of-victorians/survey-data-and-reports/victorian-population-health-survey/victorian-population-health-survey-2014>.
- DoHA (1999). National physical activity guidelines for adults. In Canberra: Department of Health and Ageing (DoHA).
- Dominguez, T. P., Dunkel-Schetter, C., Glynn, L. M., Hobel, C., & Sandman, C. A. (2008). Racial differences in birth outcomes: The role of general, pregnancy, and racism stress. *Health Psychology*, 27, 194–203.
- Dressler, W. W., Oths, K. S., & Gravlee, C. C. (2005). Race and ethnicity in public health research: Models to explain health disparities. *The Annual Review of Anthropology*, 34, 231–252.
- Ebrahim, S., & Smith, G. D. (1997). Systematic review of randomised controlled trials of multiple risk factor interventions for preventing coronary heart disease. *BMJ*, 314, 1666–1674.
- Ferdinand, A., Paradies Y., & Kelaher M. (2012). Mental health impacts of racial discrimination in Victorian Aboriginal Communities: The Localities Embracing and Accepting Diversity (LEAD) experiences of racism survey. The Lowitja Institute, Melbourne.
- Gronbaek, M. (2009). The positive and negative health effects of alcohol and the public health implications. *Journal of Internal Medicine*, 265, 407–420.
- Henry, B. R., Houston, S., & Mooney, G. H. (2004). Institutional racism in Australian healthcare: A plea for decency. *The Medical Journal of Australia*, 180, 517–520.
- Hodson, G., & Esses, V. M. (2002). Distancing oneself from negative attributes and the personal/group discrimination discrepancy. *Journal of Experimental Social Psychology*, 38, 500–507.
- Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*, 38, 21–37.
- Johnson, S. (2013). Increasing psychology's role in health research and health care. *American Psychologist*, 68, 311321.
- Manor, O., Matthews, S., & Power, C. (2001). Self-rated health and limiting longstanding illness: Inter-relationships with morbidity in early adulthood. *International Journal of Epidemiology*, 30, 600–607.
- Markwick A., Ansari Z., Clinch D., & McNeil J. (2018). Experiences of racism among Aboriginal and Torres Strait Islander adults living in the Australian state of Victoria: a cross-sectional population-based study, submitted for publication to *BMC Public Health*.
- Marmot, M. (1999). Epidemiology of socioeconomic status and health: Are determinants within countries the same as between countries? *Annals of the New York Academy of Sciences*, 896, 16–29.
- Moore, S. P., Green, A. C., Bray, F., Garvey, G., Coory, M., Martin, J., et al. (2014). Survival disparities in Australia: An analysis of patterns of care and comorbidities among indigenous and non-indigenous cancer patients. *BMC Cancer*, 14, 517.
- NACCHO (2017). The National Aboriginal Community Controlled Health Organisation (NACCHO): <http://www.naccho.org.au/about/aboriginal-health/definitions/>.
- NHMRC (2009). National Health and Medical Research Council (NHMRC): Australian alcohol guidelines to reduce health risks from drinking alcohol. Canberra. <https://www.nhmrc.gov.au/guidelines-publications/ds10>.
- Paradies, Y. (2006). Defining, conceptualizing and characterizing racism in health research. *Critical Public Health*, 16, 143–157.
- Paradies, Y., Ben, J., Denson, N., Elias, A., Priest, N., Pieterse, A., et al. (2015). Racism as a determinant of health: A systematic review and meta-analysis. *PLoS One*, 10, e0138511.
- Paradies, Y. C., & Cunningham, J. (2012). The DRUID study: Exploring mediating pathways between racism and depressive symptoms among indigenous Australians. *Social Psychiatry and Psychiatric Epidemiology*, 47, 165–173.
- Paradies, Y., Harris R., & Anderson I. (2008). The Impact of Racism on Indigenous Health in Australia and Aotearoa: Towards a Research Agenda, Discussion Paper No. 4, *Cooperative Research Centre for Aboriginal Health*, Darwin.
- Pascoe, E. A., & Smart Richman, L. (2009). Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin*, 135, 531–554.
- Perez-Zepeda, M. U., Belanger, E., Zunzunegui, M. V., Phillips, S., Ylli, A., & Guralnik, J. (2016). Assessing the validity of self-rated health with the short physical performance battery: A cross-sectional analysis of the international mobility in aging study. *PLoS One*, 11, e0153855.
- Priest, N., Paradies, Y., Trenerry, B., Truong, M., Karlsen, S., & Kelly, Y. (2013). A systematic review of studies examining the relationship between reported racism and health and wellbeing for children and young people. *Social Science & Medicine*, 95, 115–127.
- Ruggiero, K. M., & Taylor, D. M. (1997). Why minority group members perceive or do not

- perceive the discrimination that confronts them: The role of self-esteem and perceived control. *Journal of Personality and Social Psychology*, 72, 373–389.
- Schnittker, J., & Bacak, V. (2014). The increasing predictive validity of self-rated health. *PLoS One*, 9, e84933.
- Seeman, T. E., Crimmins, E., Huang, M. H., Singer, B., Bucur, A., Gruenewald, T., et al. (2004). Cumulative biological risk and socio-economic differences in mortality: MacArthur studies of successful aging. *Social Science & Medicine*, 58, 1985–1997.
- Shariff-Marco, S., Klassen, A. C., & Bowie, J. V. (2010). Racial/ethnic differences in self-reported racism and its association with cancer-related health behaviors. *American Journal of Public Health*, 100, 364–374.
- Shy, C. M. (1997). The failure of academic epidemiology: Witness for the prosecution. *American Journal of Epidemiology*, 145, 479–484 (discussion 85–87).
- Smith, S. M., & Vale, W. W. (2006). The role of the hypothalamic-pituitary-adrenal axis in neuroendocrine responses to stress. *Dialogues in Clinical Neuroscience*, 8, 383–395.
- StataCorp (2011). Stata Statistical Software: Release 12. College Station, TX: StataCorp LP. Accessed 02 Aug, 2014, (Accessed 02 Dec, 2013). <<http://www.stata.com/y>>.
- Victorian State Government, (2017). Victorian Population Health Survey. <<https://www2.health.vic.gov.au/public-health/population-health-systems/health-status-of-victorians/survey-data-and-reports/victorian-population-health-survey>>, (Accessed 12 Jan, 2017).
- Vos, T., Barker, B., Begg, S., Stanley, L., & Lopez, A. D. (2009). Burden of disease and injury in Aboriginal and Torres Strait Islander peoples: The Indigenous health gap. *International Journal of Epidemiology*, 38, 470–477.
- Watts, C., & Cairncross, S. (2012). Should the GBD risk factor rankings be used to guide policy? *Lancet*, 380, 2060–2061.
- WHO (2017). World Health Organization. <http://apps.who.int/bmi/index.jsp?IntroPage=intro_3.html>.
- Williams, D. R., & Mohammed, S. A. (2013). Racism and health I: Pathways and scientific evidence. *American Behavioral Scientist*, 57, 1152–1173.
- Wilson, M., Stearne A., Gray D., & Saggars S., (2010). Review of the harmful use of alcohol amongst Indigenous Australians. *Australian Indigenous HealthInfoNet*.
- Zhao, Y., Wright, J., Begg, S., & Guthridge, S. (2013). Decomposing Indigenous life expectancy gap by risk factors: A life table analysis. *Population Health Metrics*, 11, 1.
- Ziersch, A. M., Gallaheer, G., Baum, F., & Bentley, M. (2011). Responding to racism: Insights on how racism can damage health from an urban study of Australian Aboriginal people. *Social Science & Medicine*, 73, 1045–1053.

CHAPTER 8: DISCUSSION AND CONCLUSIONS

The purpose of this chapter is to provide an in-depth discussion of the work presented in this thesis. It will begin with a summary of the key findings. Since the subsidiary aims of this thesis were to review governmental policy-making for Aboriginal and Torres Strait Islander Australians and Victorians, and to consider the policy implications of this thesis, this will be followed by a brief history of government policy since the referendum in 1967. This will enable a discussion of the findings of this thesis in the context of both the literature and government policy. A conceptual model to explain the Aboriginal and Torres Strait Islander health and wellbeing gap is then proposed and discussed. Lastly, the strengths and limitations of the thesis are examined, followed by a consideration of future directions, the policy implications, and overall conclusions.

8.1 Summary of key findings

- This research identified food insecurity, psychological distress and racism as important social determinants of the health and wellbeing of Aboriginal and Torres Strait Islander adults who live in the Australian state of Victoria.
- Food insecurity disproportionately affects Aboriginal and Torres Strait Islander adults compared with their non-Aboriginal and Torres Strait Islander counterparts (Prevalence Ratio (PR) = 3.4; 95% confidence interval: 2.3–5.1), impacting on 20.3% (13.5–29.4%) of the Aboriginal and Torres Strait Islander adult population.
- Psychological distress disproportionately affects Aboriginal and Torres Strait Islander adults compared with their non-Aboriginal and Torres Strait Islander counterparts (PR = 2.1; 1.5–2.9), impacting on 24.5% (17.5–33.2%) of the Aboriginal and Torres Strait Islander adult population.
- Experiences of racism disproportionately affect Aboriginal and Torres Strait Islander adults compared with their non-Aboriginal and Torres Strait Islander counterparts (Odds Ratio (OR) = 4.3; 3.2–5.8), impacting on 17.0% (13.3–21.5%) of the Aboriginal and Torres Strait Islander adult population.
- The research concluded with a risk factor analysis that compared the relative contributions of the social determinants of socioeconomic status and experiences of racism, and behavioural risk factors to the gap in self-reported health status. Experiences of racism made the largest contribution explaining 34% of the gap, followed by smoking (32%), while socioeconomic status explained 15% of the gap. Together, experiences of racism and smoking explained 58% of the gap, indicating that the contribution of racism was largely independent of smoking.

- The literature and findings in this thesis implicate racism as a key determinant of the gap in health and wellbeing between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults who live in Victoria, where it may play a pivotal role, operating at multiple distal and proximate points along the causal pathway. A conceptual model was developed and will be presented and discussed in this chapter.

8.2 Policy context

The following is a brief history of government policy since the referendum in 1967. Its purpose is to enable a more productive discussion of the findings of this thesis and to highlight the relevance of these findings to policy.

8.2.1 Introduction

The Australian Federal Government is the only Australian government that raises revenue through taxation on personal and corporate income from which the state governments are apportioned funding. It is also the only Australian government with the power to significantly redistribute social and economic resources through mechanisms such as income taxation, social security, the labour market, housing, and trade (Fisher et al. 2016). In short, the Australian Federal Government exerts considerable power and control over Australia's six states and two territories. Therefore, the ability of individual states and territories to address health inequalities is relatively limited (Fisher et al. 2016).

This was not always the case, particularly in relation to Aboriginal and Torres Strait Islander Australians.

8.2.2 Brief history of Australian Government policy 1967-1995

The successful referendum of 1967 allowed for Aboriginal and Torres Strait Islander Australians to be included in the Australian census and enabled the Federal government, for the first time, to make laws for Aboriginal and Torres Strait Islander peoples that had previously been under the jurisdiction of the States and Territories (National Archives of Australia 2017). However, between 1967 and 1972, little was done and the Aboriginal and Torres Strait Islander communities had no formal role in policy-making, which was underpinned by the belief that Aboriginal and Torres Strait Islander peoples needed to abandon their way of life and cultural values in order to assimilate into non-Aboriginal and Torres Strait Islander society (Parliament of Australia 2005).

With the election of the Whitlam Government in 1972, the Federal Government began to take a significant role in policy-making and service delivery for Aboriginal and Torres Strait Islander peoples (Parliament of Australia 2005). For the first time, the Australian Government appeared to preference a politics of self-determination over assimilation, and this reputedly guided policy-making until 1996 when the Howard Government was elected (Parliament of Australia 2005).

In 1989, two significant events occurred. The first was the establishment of the Aboriginal and Torres Strait Islander Commission (ATSIC) (Palmer 2004). ATSIC was a national Aboriginal and Torres Strait Islander body run by elected Aboriginal and Torres Strait Islander officials who provided advice to government on Aboriginal and Torres Strait Islander issues, advocated for the recognition of Aboriginal and Torres Strait Islander rights, and delivered and monitored some of the Federal Government's Aboriginal and Torres Strait Islander services and programs.

The second was the publication of the National Aboriginal Health Strategy (Houston 1989). The National Aboriginal Health Strategy was the first articulation of the Aboriginal and Torres Strait Islander concept of health as not just the physical wellbeing of an individual, but the social, emotional, and cultural wellbeing of the entire community within which the individual lives. Its key priorities included building community control of Aboriginal and Torres Strait Islander health services, increasing Aboriginal and Torres Strait Islander participation in the health workforce, reforming and properly funding health services.

However, a review commissioned by the Federal Government in 1994 to evaluate the National Aboriginal Health Strategy concluded that the strategy and its underlying commitment to self-determination were never effectively implemented, due to a lack of genuine political commitment by successive Australian Governments (Aboriginal and Torres Strait Islander Commission 1994).

The early 1990s promised a growing commitment to Aboriginal and Torres Strait Islander reconciliation and self-determination, evidenced by the Redfern address of the Keating Government in 1992 (Keating 1992). For the first time, an Australian Prime Minister acknowledged the impact of European settlement on Aboriginal and Torres Strait Islander Australians.

However, while it is frequently claimed that the policy environment from 1983-1996 supported self-determination (Dockery 2011), many argue that this was more rhetorical than substantive (Aboriginal and Torres Strait Islander Commission 1994) (Morrissey 2006) (Moreton-Robinson 2009).

8.2.3 Brief history of Australian Government policy from 1996-2007

The newly elected government, in power from 1996 to 2007 under the leadership of Prime Minister John Howard, rejected self-determination arguing that it had failed and that economic development was the answer to Aboriginal and Torres Strait Islander disadvantage. This was termed 'practical reconciliation'. Practical reconciliation was to be achieved through economic development via mainstream employment. Many scholars have argued that this was a return to the assimilationist policies of 1967-72 (Dockery 2010) (Morrissey 2006).

The Howard Government, a vocal critic of the formation of ATSIC while in opposition, took the opportunity to abolish ATSIC in 2004. This was despite the findings of a review

commissioned by the Howard government, which argued that ATSIC should be restructured, not abolished because: *“Compelling evidence from around the world reveals that sustained and measurable improvements in social and economic well-being only occur when real decision-making power is vested in communities that build effective governing institutions reflecting the cultural values and beliefs of the people”* (Parliament of Australia 2005).

Subsequently, the Aboriginal and Torres Strait Islander Social Justice Commissioner, Dr William Jonas, issued a strongly worded statement that the abolition of ATSIC unfairly scapegoated ATSIC, since the government blamed ATSIC for a lack of progress, including in areas for which ATSIC held no responsibility (Aboriginal and Torres Strait Islander Social Justice Commissioner 2004). The commissioner concluded that the abolition of ATSIC would further disempower Aboriginal and Torres Strait Islander peoples, further reduce scrutiny of the government’s performance, and demonstrated the government’s antipathy towards engaging with Aboriginal and Torres Strait Islander peoples.

Under the Howard Government, policy-making entered an punitive phase with the introduction of Shared Responsibility Agreements (Baum 2007). These agreements demanded specific behaviours from all members of Aboriginal and Torres Strait Islander communities in exchange for social security benefits.

In a critique of Shared Responsibility Agreements, Anderson (2006) made the point that not only was there often a lack of evidence to support such agreements, they could be used to interfere in private lives, a move that would likely be met with fierce opposition if such policies were to be implemented in non-Aboriginal and Torres Strait Islander communities (Anderson 2006). Moreover, the interventions were primarily based on addressing people’s behaviours, which the wider literature shows is rarely successful in the absence of supportive environments and addressing the underlying determinants of those behaviours.

For example, in 2004, the Mulan Shared Responsibility Agreement was implemented in a small remote Aboriginal community that suffered from a high prevalence of trachoma (Anderson 2006). Despite the World Health Organization (WHO) issuing guidelines for trachoma control known by the acronym ‘SAFE’, consisting of surgery, antibiotics, facial cleanliness, and environmental prevention, the Mulan Shared Responsibility Agreement only focussed on face washing behaviour and management of rubbish. Yet the scientific evidence for face washing and management of rubbish in reducing trachoma prevalence rates is weak at best, while no provision was made to treat those who had already contracted trachoma and were at risk of developing blindness (Anderson 2006).

In 2005, the Aboriginal and Torres Strait Islander Social Justice Commissioner released the Social Justice Report which positioned the poor health of Aboriginal and Torres Strait Islander Australians as a human rights issue, stressing that action was needed on the social determinants of health to address critical social issues such as poor and overcrowded housing, education, self-determination and racism (Aboriginal and Torres Strait Islander Social Justice

Commissioner 2005). The first recommendation made in the report was “*That the Government of Australia commit to achieving equality of health status and life expectation between Aboriginal and Torres Strait Islander and non-Indigenous peoples within 25 years*” (Aboriginal and Torres Strait Islander Social Justice Commissioner 2005).

This resulted in the coming together of peak Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander health bodies, and human rights organisations across the country to form the National Indigenous Health Equality Campaign in March 2006 (Commonwealth of Australia 2019). The coalition consisted of approximately 40 bodies and human rights organisations, led by the Australian Human Rights Commission, the National Aboriginal Community Controlled Health Organisation (NACCHO), the Australian Indigenous Doctors’ Association, the Congress of Aboriginal and Torres Strait Islander Nurses and Midwives, the Indigenous Dentists’ Association of Australia, Oxfam Australia, and Australians for Native Title and Reconciliation (Commonwealth of Australia 2019).

‘Close the Gap’ was the public face of the campaign which advocated for a human rights-based approach to address the social determinants of Aboriginal and Torres Strait Islander health inequality in partnership with Aboriginal and Torres Strait Islander peoples and their representatives, to eliminate health inequality within a generation (Close the Gap Campaign Steering Committee 2013).

8.2.4 Brief history of Australian Government policy from 2008-2019

At the end of 2007, due to the efforts of the Close the Gap campaign and a change of federal government, the Council of Australian Governments (COAG) committed to a national strategy called ‘Closing the Gap’ and signed a formal statement of intent that was adopted in March 2008 (Commonwealth of Australia 2019). The specific use of the term ‘closing’ instead of ‘close’ was to distinguish the Aboriginal and Torres Strait Islander led human rights-based campaign from the COAG and Australian government initiative.

Concurrently, the new Prime Minister Keven Rudd made a national apology to the Stolen Generations that acknowledged, for the first time, responsibility for the assimilationist policies and practices, from the 1890s to the 1970s. These policies and practices of successive governments forcibly removed Aboriginal and Torres Strait Islander children of ‘mixed lineage’ from their families to be raised in institutions, fostered, or adopted by non-Aboriginal and Torres Strait Islander families (Australian Institute of Aboriginal and Torres Islander Studies 2020). The apology was a recommendation of the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their Families that led to the publication of the *Bringing them home* report, tabled in Parliament on 26 May 1997.

Although the Howard Government, which abolished ATSIC, was defeated at the 2007 election, subsequent governments to date, irrespective of political party, have not attempted to resurrect an elected Aboriginal and Torres Strait Islander body to provide policy advice, as

well as a formal link between Aboriginal and Torres Strait Islander communities and the Federal Government, despite calls to do so.

The goals of the Closing the Gap strategy are to increase life expectancy, access to early childhood education, educational achievement, employment outcomes, and to achieve statistical equality between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander peoples within 25 years (Commonwealth of Australia 2020).

Of the seven targets of the Closing the Gap strategy, two related to health, four to education and one to employment (Commonwealth of Australia 2020). The targets were:

1. Close the gap in life expectancy by 2031
2. Halve the gap in child mortality by 2018
3. Ensure 95 percent of Aboriginal and Torres Strait Islander four-years-olds are enrolled in early childhood education by 2025
4. Halve the gap in reading, writing and numeracy by 2018
5. Halve the gap in year 12 attainment by 2020
6. Close the gap in school attendance by 2018
7. Halve the gap in employment by 2018.

The National Aboriginal and Torres Strait Islander Health Plan 2013–2023 was published in 2013 (Commonwealth of Australia 2013). The plan states that it is informed by the principles of a human rights-based approach, full and ongoing participation of, and partnership with, Aboriginal and Torres Strait Islander peoples and organisations at all levels of decision-making, and accountability through monitoring and evaluation (Commonwealth of Australia 2013). It also states that it recognises the importance of culture to Aboriginal and Torres Strait Islander health and wellbeing and is strengths and evidence-based.

The plan lists the following as its stated aims to accomplish the goals of the Closing the Gap strategy:

- Improve access to culturally appropriate healthcare
- Eliminate systemic racism within the healthcare sector
- Address environmental, economic, and social inequalities through action on the social determinants of housing, education, and employment.

8.2.5 Critique of the Closing the Gap strategy

Introduction

The Closing the Gap strategy has been both lauded and contested. Lauded for statements contained in the National Aboriginal and Torres Strait Islander Health Plan 2013–2023 that acknowledge that the dispossession of Aboriginal and Torres Strait Islander lands, interruption of culture, and transgenerational trauma has negatively impacted on the health and wellbeing of Aboriginal and Torres Strait Islander Australians (Commonwealth of Australia

2013). Lauded because the plan also recognises the centrality of culture for good health, the importance of partnership and shared ownership with Aboriginal and Torres Strait Islander peoples, and espouses a human rights, evidence-based and strengths-based approach.

Moreover, in an analysis of health policy across Australia, it was the Closing the Gap strategy that stood out as being most likely to address the social determinants of health, and hence extolled as an example of how health policy should be done (Fisher et al. 2016) (Fisher et al. 2019). These analyses were predicated upon the widespread observation that despite the existence of ample scientific evidence to show that the social determinants make the biggest impact on health and are responsible for health inequalities, most governments across the world struggle to translate this evidence into policy (Fisher et al. 2019). More often than not, governments start out discussing the upstream social determinants before ‘drifting’ to downstream health behaviours of individuals as the policy solutions. This is termed ‘lifestyle drift’ (Carey 2016).

The Closing the Gap strategy is also the first time that there has been an agreement between all the Federal, State and Territory governments of Australia, and that the goal of statistical equality and the use of evidence-based methods is clearly stated (Pholi et al. 2009). However, the same authors note that: *“It still reduces Aboriginal people to a range of indicators of deficit to be monitored and fixed by government and retains the large imbalance of power and control over Aboriginal affairs”* (Pholi et al. 2009).

Independent review of Closing the Gap, 2019

In 2019, The Department of the Prime Minister and Cabinet commissioned an independent review of the Closing the Gap strategy to determine its effectiveness and appropriateness (Commonwealth of Australia 2019).

The review found that while what was included in the Closing the Gap strategy was still generally supported, what was not included presented a significant barrier to achieving its objectives (Commonwealth of Australia 2019). For example, transgenerational trauma and the impacts this has on Aboriginal and Torres Strait Islander communities is largely ignored, as is justice and addressing the high incarceration rate of Aboriginal and Torres Strait Islander peoples in every state across Australia (Commonwealth of Australia 2019).

While the Closing the Gap strategy acknowledges the harmful effects of racism on health, it only seeks to address racism within the healthcare sector, ignoring the wider existence and impact of interpersonal and institutional or systemic racism in other important sectors. Moreover, despite the stated aim of eliminating racism in the healthcare sector, it appears that there are very few instances of any action actually having been taken (Fisher et al. 2016) (The Lowitja Institute 2020).

The independent review of the Closing the Gap strategy interviewed key stakeholders (Aboriginal and Torres Strait Islander leaders and peak bodies, government agencies,

policymakers and advisors, and service providers) and found that the majority view was, that in practice, the services provided by mainstream healthcare remained paternalistic towards Aboriginal and Torres Strait Islander patients and intolerant of cultural differences (Commonwealth of Australia 2019). Moreover, when the term ‘racism’ was first raised as an important barrier to Aboriginal and Torres Strait Islander peoples utilising mainstream health services, there was significant resistance on the part of government to using the term ‘racism’ and to state that it existed in the healthcare sector (Fisher et al. 2019).

Another area of omission is culture and the cultural determinants. Despite the importance of supporting and promoting Aboriginal and Torres Strait Islander cultures being clearly articulated within the Closing the Gap strategy as being central to improving Aboriginal and Torres Strait Islander health, there has been little, or no action taken (Commonwealth of Australia 2019).

This is reflected in the Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013-2023 which states that: *“The social and cultural determinants of health will be discussed in more detail in a future revision of the Implementation Plan”* (Department of Health 2015).

Moreover, Cooper (2011) noted that the positive statements supporting Aboriginal and Torres Strait Islander culture in the Closing the Gap documents did not align with the policy solutions, which were often negative about Aboriginal and Torres Strait Islander culture (Cooper 2011).

Consequently, the steering committee of the Close the Gap campaign has made the cultural determinants of Aboriginal and Torres Strait Islander health a focus of their 2020 shadow report, calling for action (The Lowitja Institute 2020).

Overall, the independent review commissioned by the Department of the Prime Minister and Cabinet in 2019 concluded that there was *“... too strong a focus on individual responsibility and agency and that more attention needs to be paid to the context within which Aboriginal and Torres Strait Islander communities live. More emphasis needs to be placed on genuine engagement with, and empowerment of, Aboriginal and Torres Strait Islander communities to implement this and other initiatives in the future”* (Commonwealth of Australia 2019).

This suggests that despite the statements about addressing the social and cultural determinants of health, ‘lifestyle drift’ has in fact occurred. This is supported by a careful reading of the Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013-2023, which while acknowledging the importance of the social and cultural determinants of health, disproportionately focuses on changing the behaviour of individuals—largely through health promotion aimed at improving health literacy (Department of Health 2015).

For example, the Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013-2023 in describing how the social determinants of income, employment, education, and community safety impact on health states: “...good health enables participation in the labour force, which models good behaviour in children to go to school and provides an income that can support healthy choices (e.g. good nutrition and exercise for individual and their families.” (Department of Health 2015).

Not only does this statement situate the responsibility entirely with Aboriginal and Torres Strait Islander peoples hence ignoring the broader context of Aboriginal and Torres Strait Islander lives, it suggests that it is their behaviours and not the determinants of those behaviours that require correcting.

Yet in the context of the particular reference to education, the evidence (presented in chapter 1) shows that there is no clear and consistent relationship between health and education among Aboriginal and Torres Strait Islander Australians. This is in contrast to what has been observed in many countries and in other populations across the world, where education has been found to be health-promoting.

This highlights the pitfalls of extrapolating the findings from one population to another as was done by the Australian Medical Association, the Australian Bureau of Statistics and the Australian Institute of health and welfare (Dunbar and Scrimgeour 2007). These organisations assumed that because western education was found to be health-promoting in the non-Aboriginal and Torres Strait Islander population it would be a key factor in improving Aboriginal and Torres Strait Islander health (Dunbar and Scrimgeour 2007).

Malin (2003) hypothesised that the positive effects of education on health that are seen in other populations may not be seen in Aboriginal and Torres Strait Islander populations in Australia, due to the negative impacts that the social exclusion of Aboriginal and Torres Strait Islander children in schools has on their social and emotional health and wellbeing which may effectively nullify any positive effects of schooling on their health.

This is supported by consistent findings that Aboriginal and Torres Strait Islander children across Australia, including Victoria, experience racism and discrimination from both students and teachers and that this impacts on school attendance (Priest et al. 2012). This is also supported by the findings in chapter 6 of this thesis that low educational attainment appears to be protective against experiences of racism, while the higher the level of educational attainment the greater the prevalence of experiences of racism.

Therefore, modelling ‘good behaviour in children to go to school’ as a means of increasing school attendance is not only likely to be unsuccessful but implies that the primary reason for poor school attendance is the poor behavioural choices of Aboriginal and Torres Strait Islander children.

This is problematic in a number of ways. First, it runs the risk of further stigmatising Aboriginal and Torres Strait Islander children, therefore reinforcing racist perceptions and beliefs in the non-Aboriginal and Torres Strait Islander community.

Second, it fails to recognise the existence of systemic racism within the education sector, thus failing to hold to account those who perpetuate and maintain systemic racism. If one does not acknowledge that a problem exists, there can be no remedy.

Third, by not addressing the barriers to school attendance, the target of closing the gap in school attendance by 2018 is unlikely to be met. Failure to meet the target is likely to be blamed on the Aboriginal and Torres Strait Islander community because the policy solutions target the behaviour of Aboriginal and Torres Strait Islander children. This in turn is likely to reinforce and perpetuate negative perceptions in the non-Aboriginal and Torres Strait Islander community contributing to the barriers to school attendance in the first place. Given that this is being written in 2020, this target has in fact failed.

Fourth, given the well-documented health-harming impacts of racism, in the absence of addressing systemic racism in schools, increasing school attendance of Aboriginal and Torres Strait Islander children may do more harm than good by increasing their exposure to racism.

The current policy environment

Cooper (2011) argues that the current policy environment assumes three things: (1) the policy environment from 1983-1996, which claimed to support self-determination, has failed and Aboriginal and Torres Strait Islander peoples are afflicted with 'welfare dependency'; (2) traditional Aboriginal and Torres Strait Islander cultures, which are based on communal sharing, customary forms of authority and a desire to live on traditional lands away from established markets, are incompatible with Western neoliberal individualistic thinking; and (3) an assertive top-down managerial approach is required even if it involves increasing intrusion into the lives of Aboriginal and Torres Strait Islander peoples (Cooper 2011).

As discussed earlier in this chapter, the review commissioned by the Federal Government in 1994, concluded that the claim that the policy environment for Aboriginal and Torres Strait Islander affairs was based on self-determination was more rhetorical than substantive (Aboriginal and Torres Strait Islander Commission 1994). Thus, the first assumption is not supported by the evidence, despite it being used by the Howard government to justify its doctrine of 'practical reconciliation' from 1996-2007 (Aboriginal and Torres Strait Islander Commission 1994).

The second assumption of a perceived incompatibility of Western and Aboriginal and Torres Strait Islander cultures and the dominance of the Western neoliberal individualistic view of the world, may go a long way in explaining why the social and cultural determinants continue to be largely ignored. Western neoliberal thinking by its very nature individualises social ills

and therefore may be a significant barrier to action on the social and cultural determinants of health, resulting inevitably in lifestyle drift (Pholi et al. 2009).

The third assumption that a top-down managerial approach is required in policy-making may explain why the statements in the Closing the Gap strategy about consulting and partnership with Aboriginal and Torres Strait Islander peoples and their leaders and organisations remain largely unheeded (The Lowitja Institute 2020).

These assumptions suggest that there are significant ideological and cultural barriers to moving the Closing the Gap strategy beyond rhetoric that are situated not in the Aboriginal and Torres Strait Islander community but rather in the non-Aboriginal and Torres Strait Islander community. The following events support this contention:

1. The United Nations Declaration on the Rights of Indigenous Peoples, 2007

First, is the response by both major political parties to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), which was adopted by the United Nations in 2007. The governments of the settler colonial countries of Australia, Canada, New Zealand and the USA voted against the declaration, arguing that the level of autonomy recognized for Indigenous peoples in the UNDRIP would undermine their sovereignty, especially in relation to disputes over land and the natural resources associated with the disputed land (Moreton-Robinson 2009).

It was not until 2009 that Australia reversed its position and agreed to support the UNDRIP. However, the Australian government's true commitment to the UNDRIP, irrespective of which political party is in power, continues to be disputed as evidenced by the frequent use of the terms 'aspirational' and 'non-binding' in Australian government communications and documents that refer to the UNDRIP (Moreton-Robinson 2009).

2. The Redfern statement (2016)

Second, is the Redfern Statement. During the 2016 federal election, 17 national and state-based Aboriginal and Torres Strait Islander organisations, supported by over 30 other Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander organisations, launched the Redfern Statement which was presented to the Prime Minister early in 2017.

The Redfern Statement calls for all Australian governments to listen to Aboriginal and Torres Strait Islander peoples and commit to genuine and substantive engagement and dialogue with Aboriginal and Torres Strait Islander peoples and their organisations (Australians for Native Title and Reconciliation 2020). The Redfern Statement is essentially a plan to address the severe disadvantage and inequality that Aboriginal and Torres Strait Islander peoples continue to live. It notes that despite the numerous reports and inquiries into Aboriginal and Torres Strait Islander disadvantage, rarely have their recommendations been implemented by successive Australian governments. For example, it has been over 25 years since the Royal

Commission into Aboriginal Deaths in Custody and not only have most of the recommendations been ignored, the number of deaths in custody continues to increase.

Therefore, it is clear that from the Aboriginal and Torres Strait Islander perspective that they continue to be left out of Federal Government policy-making, despite claims to the contrary, articulated in the Closing the Gap strategy documents.

3. The Uluru Declaration of the Heart (2017)

Third, is the current Federal Government's ongoing opposition to the Uluru Declaration from the Heart, which calls for: (1) truth-telling about Australia's history; (2) a Makarrata Commission to supervise a process of developing treaties between governments and Aboriginal and Torres Strait Islander communities and; (3) a representative Aboriginal and Torres Strait Islander advisory body or 'voice' that would provide advice to the Australian government on policy-making in relation to Aboriginal and Torres Strait Islander Australians (The Referendum Council 2017). This body would be enshrined in the constitution through a referendum so that successive governments cannot repeal such a body, as occurred with ATSIC in 2004 (The Referendum Council 2017).

Currently Aboriginal and Torres Strait Islander Australians are not recognised in the Australian constitution. In 2015, the Prime Minister and Leader of the Opposition established the Referendum Council to consult with Aboriginal and Torres Strait Islander peoples on their views of meaningful recognition in the constitution (The Referendum Council 2017). This culminated in the National Constitutional Convention in 2017 where a consensus position was reached on the form constitutional recognition should take. The consensus position was articulated in the Uluru Statement from the Heart.

Statistical equality and deficit discourse

The concept of 'statistical equality' is in itself fraught. Not only does it reflect a deficit discourse where Aboriginality is represented as deficient, negative, failed and a problem to be solved, but it assumes this on the basis of comparisons with the non-Aboriginal and Torres Strait Islander population who are held up as the gold standard (Fogarty et al. 2018).

Statistical disparities between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Australians are a double-edged sword. They can be used to politicize issues of inequality by drawing attention to government failure to provide effective and culturally appropriate services and policy solutions. However, divorced from the social and environmental context and constantly reiterated, such statistical disparities enable narratives to be constructed that homogenise and dehumanise Aboriginal and Torres Strait Islander peoples while simultaneously concealing structural inequalities. This type of narrative is referred to as 'deficit discourse', where groups of people are represented in terms of deficiency (Fogarty et al. 2018).

Fogarty et al (2018) state that deficit discourse is implicated in the reinforcement of racial stereotypes, thus contributing to external and internalised racism (Fogarty et al. 2018).

Moreover, they cite evidence that the deficit discourse has a negative impact on health where the constant reporting of negative stereotypes and prevalence rates actually reinforces undesired behaviours that harm health and wellbeing.

However, Fogarty et al (2018) also note that a discussion of the extreme socioeconomic disadvantage Aboriginal and Torres Strait Islander peoples experience is not in itself deficit discourse (Fogarty et al. 2018). Deficit discourse occurs when discussion and policy aimed at alleviating disadvantage become caught up in narratives of failure and dysfunction where the problem and policy solutions are situated with Aboriginal and Torres Strait Islander peoples, rather than the wider society.

In their review of the Closing the Gap documents, they conclude that while espousing a strengths-based approach, this again is more rhetorical than substantive, and the strategy in practice retains the deficit discourse that has essentially characterised policy-making for Aboriginal and Torres Strait Islander Australians since 1967 (Fogarty et al. 2018).

Choice of social determinants

It is unclear why the Closing the Gap campaign chose to almost exclusively focus on the social determinants of education and employment. This may reflect the historical policies of the 1990s that sought to address Aboriginal and Torres Strait Islander socioeconomic disadvantage through addressing education and employment (Gunstone 2008).

However, as discussed in chapter 1 of this thesis, a considerable amount of scholarly work has been done to identify the key social determinants of the health and wellbeing of Aboriginal and Torres Strait Islander Australians. This work, commissioned by the Cooperative Research Centre for Aboriginal Health (CRAH), resulted in the coming together of over 50 health, academics and other experts from across Australia and culminated in the publication of the two peer-reviewed monographs (Anderson et al. 2007) (Carson et al 2007).

While education and employment were identified as 2 of the 16 key social determinants, other key social determinants include poverty, social class, income, racism, marginalisation, incarceration, the justice system, housing, infrastructure, family separation, history and health, cultural genocide, assimilation, and transgenerational trauma. Most of these social determinants are associated with racism—a central and unifying theme. It was for this reason that this thesis measured and investigated racism.

Moreover, these social determinants largely situate the cause of the disadvantage faced by Aboriginal and Torres Strait Islander peoples in the wider society rather than Aboriginal and Torres Strait Islander peoples. Therefore, the logical policy solutions to these social determinants would require a change in the beliefs and behaviour of non-Aboriginal and Torres Strait Islander peoples and the systems that they have created which continue to perpetuate and reinforce Aboriginal and Torres Strait Islander disadvantage.

As discussed earlier, addressing barriers to education such as racism, would also situate the cause of disadvantage faced by Aboriginal and Torres Strait Islander peoples in the wider society (Priest et al. 2012). However, the policy solutions for improving educational outcomes appear to be centred around 'modelling good behaviour in Aboriginal and Torres Strait Islander children to go to school' (Department of Health 2015).

Similarly, there is evidence that racism is a significant barrier to the employment of Aboriginal and Torres Strait Islander Australians (Gray et al. 2011) (Biddle et al. 2013). Biddle et al (2013) found evidence that some Aboriginal and Torres Strait Islander Australians may decrease their labour supply to avoid exposure to workplace racism, similar to Aboriginal and Torres Strait Islander children avoiding school as an act of self-protection from racism (Biddle et al. 2013).

However, a search of the Australian government and other websites, revealed that the current policy solutions to Aboriginal and Torres Strait Islander unemployment appear to be limited to providing unemployed Aboriginal and Torres Strait Islander peoples with skills training, work experience, and employment services (The Australian Government Department of the Prime Minister and Cabinet 2018). This includes being subject to controversial and coercive 'mutual obligations' for the continued receipt of unemployment benefits.

Yet the evidence shows that unemployed Aboriginal and Torres Strait Islander Australians are more likely to experience racism than their employed counterparts, possibly because the necessary repeated interactions with new potential employers in the search for employment present greater opportunities for exposure to racism (Biddle et al. 2013). This is supported by the finding in chapter 6 of this thesis that unemployed Aboriginal and Torres Strait Islander adults in Victoria were almost twice as likely to have experienced racism in the preceding 12 months as those who were employed.

Thus, collectively, the current policy solutions for reducing unemployment and improving educational attendance situate the problem entirely with Aboriginal and Torres Strait Islander peoples and ignore the barriers and structural reasons for the higher unemployment and lower school attendance rates.

This is concerning, given that racism is harmful to health and wellbeing. By insisting that Aboriginal and Torres Strait Islander children go to school and unemployed adults seek employment, potentially puts them at greater risk of exposure to racism. This in turn may undermine and possibly undo any health-promotional benefits associated with education and employment, effectively creating a 'catch 22'.

Recent update on the Closing the Gap strategy

In July 2020, the new national agreement on Closing the Gap was released (Allam 2020a). The number of targets was increased to include new targets on justice, safety, housing, land and waters, and Aboriginal and Torres Strait Islander languages. The agreement was reached after

months of negotiation between Aboriginal and Torres Strait Islander peak organisations and the state, territory and federal governments, representing, possibly for the first time in the history of the Closing the Gap strategy, a genuine attempt to consult with Aboriginal and Torres Strait Islander peoples.

However, there has been substantial criticism of the targets—specifically that they are unambitious (Allam 2020b). Moreover, the target on reducing the incarceration of Aboriginal and Torres Strait Islander children was announced just days after the decision by the federal Council of Attorneys-General not to raise the age of criminal responsibility from 10 to 14 years. Given that the majority of children aged between 10 and 14 who are currently incarcerated in Australia are Aboriginal and Torres Strait Islander, increasing the age of criminal responsibility would have gone a long way to reducing the incarceration rate of Aboriginal and Torres Strait Islander children.

Moreover, the policy solutions for meeting the new targets remain to be elucidated and an implementation plan to be developed.

Conclusions of critique of the Closing the Gap strategy

In conclusion, a reasonable question that requires an answer is how politically committed are Australian governments, irrespective of political party, to the real achievement of statistical equality for Aboriginal and Torres Strait Islander Australians? Are the statements embedded in the Closing the Gap documents about the importance of partnership and shared ownership with Aboriginal and Torres Strait Islander peoples, as well as using human-rights, evidence-based, and strengths-based approaches, simply more rhetoric—consistent with the evidence to date?

8.2.6 The Victorian State Government's approach to addressing Aboriginal and Torres Strait Islander inequality and disadvantage

In March 2015, after a change in government in 2014, the new Victorian Government committed to self-determination as the new policy framework to guide Aboriginal and Torres Strait Islander affairs in Victoria (Department of Premier and Cabinet 2018a).

In addition to the commitment to self-determination, the current Victorian Government appears to be the state in Australia with the most progressive agenda for addressing Aboriginal and Torres Strait Islander disadvantage and inequality.

For example, on 11th July 2020 the Victorian Government announced that it will establish a truth-telling process to recognise and address historic and ongoing injustices against Aboriginal and Torres Strait Islander Australians (SBS News 2020).

Moreover, in January 2018, the Victorian Government set up the Treaty Advancement Commission, an independent office to begin the process of developing a treaty or treaties between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander

Victorians—the only state in Australia to do so (Victorian Treaty Advancement Commission 2018).

Historically, in response to the Federal Government’s Closing the Gap Strategy, Victoria developed the Victorian Aboriginal Affairs Framework (VAAF) which was adapted to reflect the Victorian context. The VAAF includes additional areas to be addressed that were not included in the Federal Government’s Closing the Gap strategy (Department of Premier and Cabinet 2018b). These were child protection, justice outcomes, health, housing and homelessness, and maternal health.

In 2018, 10 years since the states and territories signed up to the Closing the Gap strategy, the Victorian Government conducted a state-wide consultation with communities, Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander organisations, and government, for the purpose of revising the VAAF (Department of Premier and Cabinet 2018a). This included the views of more than 600 Aboriginal and Torres Strait Islander Victorians.

A major finding of the community consultations was that the 2013-2018 VAAF largely focused on behavioural risk factors, implying that Aboriginal and Torres Strait Islander disadvantage and inequality were due to Aboriginal and Torres Strait Islander behaviour and hence Aboriginal and Torres Strait Islander Victorians were solely responsible for their own disadvantage and inequality (Department of Premier and Cabinet 2018a).

The overall consensus of the community consultations was that the next iteration of the VAAF should acknowledge the historical and ongoing impacts of colonisation: *“... including that Victoria’s structures and systems were established with the specific intent of excluding Aboriginal people and their laws, customs and traditions”* which has *“resulted in, and entrenched, systemic and structural racism against Aboriginal Victorians”* (Department of Premier and Cabinet 2018b).

The VAAF was subsequently revised to cover the period 2018-2023 and as a result of the community consultations represents a substantial change in direction (Department of Premier and Cabinet 2018a). The new VAAF highlights four key areas and these are to: (1) Prioritise culture; (2) Address trauma and support healing; (3) Address racism and promote cultural safety; and (4) Transfer power and resources to communities.

The revised VAAF is also a significant departure from the federal led Closing the Gap strategy. It recognises the centrality of systemic racism across all sectors as a barrier to achieving statistical equality. It also recognises the health-promoting benefits of Aboriginal and Torres Strait Islander culture which it and seeks to strengthen and promote. Moreover, the VAAF was revised after extensive and substantive consultations with Aboriginal and Torres Strait Islander peoples and organisations.

The revised VAAF states: “*We know that Aboriginal people know what is best for themselves, their families and their communities. Self-determination is the human right that underpins this vision and our collective efforts under the VAAF*” (Department of Premier and Cabinet 2018b). To the best of this author’s knowledge, this is the first time such a statement has been made in an official government document and suggests a break with the top-down approach of policy-making that continues to characterise policy-making in relation to Aboriginal and Torres Strait Islander peoples by Australian governments.

Subsequently, the Victorian Department of Health and Human Services developed the Korin Balit-Djak: Aboriginal Health, Wellbeing and Safety Strategic Plan 2017–2027 without an implementation plan (Department of Health and Human Services 2017). The development of the implementation plan has been referred to the Aboriginal Strategic Governance Forum which consists of co-chairs from peak Aboriginal and Torres Strait Islander organisations such as the Victorian Aboriginal Community Controlled Health Organisation (VACCHO).

This appears to be one of the first systematic attempts in Australia to co-design policy solutions with the peoples who will be affected by the policy solutions—Aboriginal and Torres Strait Islander Victorians. However, it remains to be seen as to how successful this will be and whether the Victorian State Government remains fully committed to this path going forward.

8.3 Discussion of the findings of the thesis

8.3.1 Introduction

This thesis identified food insecurity, psychological distress, and experiences of racism as important social determinants of the gap in health between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults who live in the state of Victoria.

8.3.2 Food insecurity

The very existence of food insecurity in a country as wealthy as Australia is a cause for concern. However, the finding that food insecurity is disproportionately experienced by Aboriginal and Torres Strait Islander adults in Victoria (the second wealthiest state of Australia) where more than one in five (20.3%) Aboriginal and Torres Strait Islander adults experienced food insecurity in the past 12 months, compared with 5.4% of non-Aboriginal and Torres Strait Islander adults, is particularly concerning.

Food insecurity has been shown to be associated with an increased risk of some birth defects, anaemia, malnutrition, cognitive problems, aggression and anxiety, behavioural problems, depression, suicide ideation, being hospitalised, and asthma in children (Gundersen et al. 2017). In adults, food insecurity has been shown to be associated with an increased risk of malnutrition, mental health problems, diabetes, hypertension, hyperlipidaemia, being in fair or poor health, and poor sleep (Gundersen et al. 2017).

Moreover, there is a large and growing body of literature that indicates that food insecurity is associated with obesity in what is referred to as the ‘food insecurity–obesity paradox’ (Dinour et al. 2007) (Franklin et al. 2012). For example, a cross-sectional study of nationally representative data obtained from the National Health and Nutrition Examination Survey of American adults confirmed that the prevalence of food insecurity increased from 9% in 1999 to 18% in 2016 and adults with greater adiposity had a higher odds of food insecurity compared with those with less adiposity (Myers et al. 2020).

The cross-sectional descriptive analysis of survey data from the Victorian Population Health Survey (chapter 3) not only identified that Aboriginal and Torres Strait Islander adults disproportionately experienced food insecurity but that they were also significantly more likely to be obese than their non-Aboriginal and Torres Strait Islander counterparts. Almost one-quarter (24.7%; 18.2–32.8%) of Aboriginal and Torres Strait Islander adults had a body mass index that was indicative of obesity, compared with 17.5% (16.9–18.1%) of non-Aboriginal and Torres Strait Islander adults.

Although an association between obesity and food insecurity may seem counterintuitive, there is evidence to suggest that obesity can occur as a physiological adaptation to cyclical food restriction. It develops as an adaptive physiological response to periodic episodes of food insecurity, leading to compensatory over-eating when food is plentiful that in turn is associated with an increase in body fat, decrease in muscle mass and rapid weight gain (Seligman et al. 2010).

Moreover, the stress associated with food insecurity activates the body’s normal physiological responses to stress through two pathways. First, it activates the neural stress–response network (the sympathetic–adrenal–medullary (SAM) axis) that reduces executive function, resulting in the individual making poorer decisions (Dallman 2010). Second, the hypothalamic–pituitary–adrenal axis (HPA) is stimulated to release the hormone cortisol, which increases the desire for foods that are high in sugar and fat (Torres et al. 2007).

Foods that are high in sugar and fat tend to be energy-dense and potentially obesogenic. Laboratory studies have shown that when a person is sad, they tend to prefer unhealthy foods such as buttered popcorn and chocolate. In contrast, when a person is happy, they tend to prefer healthy foods such as raisins (Garg et al. 2007). Eating foods that are high in sugar and fat reduces the stress response, thus decreasing the unpleasant feelings of anxiety and reinforcing the feeding habit (Laraia 2013). When the stress is chronic, in that it is repeated frequently over time, this leads to the accumulation of visceral fat and diet-induced obesity.

Since food insecurity among high-income countries is primarily due to a lack of economic resources with which to purchase food, food insecure people often have no choice but to rely on foods that are high in sugar and fat because these foods are far cheaper than healthy foods (Headey et al. 2019).

A study conducted in Victoria costed a healthy food basket for a family of four and found that the mean cost of the basket represented 31 per cent of the income of a welfare-dependent household who constitute approximately 20% of the Australian population (Kettings et al. 2009). The study concluded that a healthy diet was unaffordable for socioeconomically disadvantaged people.

This is consistent with the findings in this thesis (chapter 3) that Aboriginal and Torres Strait Islander households have significantly lower total annual household incomes than their non-Aboriginal and Torres Strait Islander counterparts.

A major international review of diet-related chronic diseases conducted by the WHO concluded that there was a need for comprehensive strategies across all sectors involved in food supply to address diet-related chronic diseases and stated *“Food strategies must not merely be directed at ensuring food security for all, but must also achieve the consumption of adequate quantities of safe and good quality foods that together make up a healthy diet.”* (World Health Organization 2003).

However, the recommendations of the report have been not been systematically implemented across the world and the most common strategies taken up by governments have been limited to the promotion of healthy foods via social marketing and consumer education to try to change the behaviour of individuals (Morgan and Worsley 2011).

Moreover, while the growing prevalence of obesity has long been a national public health priority across the high-income countries of the world, the scientific evidence on the social determinants of obesity, such as food insecurity, is yet another example of academic scholarship that has failed to be translated into government policy. Logically, it would follow that successfully addressing food insecurity would potentially reap benefits well beyond reducing the prevalence of food insecurity, as it may also reduce the prevalence of obesity, or at the very least slow the rise in the prevalence of obesity.

Interestingly, a qualitative study that sought to determine why there continues to be low levels of fruit and vegetable consumption (an indicator of a poor diet) in Australia found a mismatch between what food system experts stated were the reasons for these low levels and what they proposed as the policy solutions individuals (Morgan and Worsley 2011). The food experts interviewed in this study were recruited from all sectors—academia, the non-profit community sector, industry, health services and government.

The most common reasons given for inadequate consumption of fruit and vegetables included the perceived high cost of fruit and vegetables, a lack of access to fruit and vegetables, that fruit and vegetables are less appetising and filling than other foods, and time pressures where the preparation of fruit and vegetables takes too long. Less frequently cited were reasons pertaining to consumer knowledge, motivation and skills. In contrast, the proposed policy solutions were mainly consumer-oriented in the form of social marketing and consumer education to promote fruit and vegetable consumption.

The authors concluded that this misalignment of causes and solutions may be counterproductive to the aim of increasing fruit and vegetable consumption to improve diets and reduce diet-related chronic disease. They also pointed out the evidence that consumer-oriented strategies are unlikely to be effective, particularly among those of low socioeconomic status. If an individual cannot afford healthy food, no amount of social marketing and education will change that. This could be argued as another example of ‘lifestyle drift’ supporting a shift in policy priorities from targeting consumers to targeting the food supply structure and costs.

A careful search of the National Aboriginal and Torres Strait Islander Health Plan 2013–2023 found that there is no mention food insecurity, while obesity is described as being due to a poor diet and insufficient physical activity (Commonwealth of Australia 2013).

In contrast, the Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013–2023 does mention food (in)security but only in the context of establishing a coordination mechanism to undertake a nutrition framework gap analysis and address identified gaps, including among other factors, food (in)security. To date, the analysis has yet to be published and its status is unknown.

With respect to the prevention of chronic disease, the implementation plan states that it: *“...supports initiatives that promote healthy lifestyle choices, reduce health risks, and focus on early identification and referral to clinical support services and treatment”* (Department of Health (2015)). Thus, the policy solutions for the prevention of chronic ill-health again rely on changing the ‘choices’ and behaviours of individual Aboriginal and Torres Strait Islander peoples—another example of ‘lifestyle drift’.

Lee and Turner (2016) noted that one of the proposed Close the Gap targets that was rejected, was to provide 90% of Indigenous families access to a healthy food basket for less than 25% of their total income by 2018 (Lee and Turner 2016).

In contrast, the Victorian Korin Korin Balit-Djak: Aboriginal Health, Wellbeing and Safety Strategic Plan 2017–2027 does mention food insecurity stating that *“Aboriginal adults in Victoria are more than three times as likely to have experienced food insecurity than non-Aboriginal Victorians”*, informed by the publication arising from this thesis.

The plan also mentions the higher prevalence of obesity among Aboriginal and Torres Strait Islander adults in Victoria and proposes the following strategic direction: *“Support improved dental health and obesity outcomes by reducing sugary drink consumption through a multipronged strategy targeting supply and promotion.”* Although the plan does not appear to make the connection between food insecurity and obesity, the policy solutions proposed for tackling obesity target supply and promotion of sugary drinks, addressing the structural and enabling determinants of sugary drink consumption—a social determinants approach.

This is a marked departure from the federal approach. However, an implementation plan remains to be developed and released.

8.3.3 Psychological distress

The topic of the social determinants of health is multi-disciplinary, embraced by different fields such as sociology, economics, epidemiology, and psychology, all with differing definitions, categorisations, and measures of the social determinants, even within the same discipline. For example, food insecurity has been identified as a social determinant in its own right, a psychosocial risk factor, and is also a measure of the social determinants of socioeconomic status and poverty.

Similarly, psychological distress has been variously described as a health outcome, a health risk factor, and a social determinant in its own right. One school of thought describes psychological distress as a psychosocial risk factor (Ansari et al. 2003). In contrast, another school of thought sees psychological distress not as a psychosocial risk factor but a mechanism by which psychosocial risk factors influence physical health outcomes (Macleod and Davey Smith 2003). In this school of thought, food insecurity and experiences of racism would be considered psychosocial risk factors that may impact on physical health through inducing psychological distress.

The 2008 Victorian Population Health Survey collected very little data on adverse life experiences, except food insecurity and financial stress. Therefore, in attempting to understand the inequality in psychological distress, this thesis explored the potential contribution of inequalities in social capital and socioeconomic status. Although food insecurity and financial stress were described as measures of socioeconomic status in this research, they can also be considered to be adverse life experiences.

Irrespective of how food insecurity is conceived, it made the largest contribution to the gap in psychological distress between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults, reducing the OR by 26%, reflecting the strong association between food insecurity and psychological distress—38.6% (35.0–42.3%) of adults in Victoria who experienced food insecurity had high or very high levels of psychological distress, compared with 9.8% (9.3–10.4%) of adults who did not experience food insecurity.

This suggests that addressing the social determinant of food insecurity in Aboriginal and Torres Strait Islander adults in Victoria may not only improve health and wellbeing overall, potentially reduce or slow the rise in the prevalence of obesity, but may also reduce the prevalence of psychological distress which in turn would improve health and wellbeing.

Other variables that were independently associated with psychological distress and partially explained the higher prevalence of psychological distress among Aboriginal and Torres Strait Islander adults, included in decreasing rank of contribution: total annual household income; financial stress; employment status; educational attainment; bridging, linking, and bonding

social capital. While household income, employment status, and educational attainment are classical measures of socioeconomic status, financial stress can be both a consequence of low socioeconomic status as well as a reflection of low socioeconomic status.

Given the complexity of the concepts under discussion, I will now briefly recap on the concept of social capital. A simple definition of social capital is the '*resources that are accessed by individuals as a result of their membership of a network or a group*' (Kawachi and Berkman 2014). It reflects the broader dynamics of the distribution of power in a society. Bonding social capital specifically refers to the relationships between Aboriginal and Torres Strait Islander peoples. Bridging social capital to the relationships between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander peoples. Linking social capital to the relationship between Aboriginal and Torres Strait Islander peoples and the formal structures of power, such as the government (Mignone 2009).

Given that the socioeconomic status of the Aboriginal and Torres Strait Islander population overall is substantially lower by every measure of socioeconomic status than their non-Aboriginal and Torres Strait Islander counterparts, the economic resources needed for a poverty-free life may lie beyond the reach of many Aboriginal and Torres Strait Islander communities. Therefore, the findings of low levels of bridging and linking social capital in this research are of concern, although consistent with studies in other Aboriginal and Torres Strait Islander populations across the country (Brough et al. 2006) (Browne-Yung et al. 2013).

These studies attributed the low levels of bridging and linking social capital to social exclusion associated with racism and discrimination. Understanding the reasons for the low levels of bridging and linking social capital is crucial to finding remedies, thus further research is needed. If racism and discrimination are indeed major barriers to the accrual of bridging and linking social capital, then addressing racism and discrimination is likely to be key to addressing socioeconomic disadvantage of Aboriginal and Torres Strait Islanders which in turn may have health and wellbeing benefits.

Whether the low levels of bridging and linking social capital among Aboriginal and Torres Strait Islander adults in Victoria were also associated with racism and discrimination was unable to be determined in the research presented in chapter 5, as data on experiences of racism was not collected in the 2008 Victorian Population Health Survey.

However, these findings were part of the impetus for the successful advocacy on the part of the author of this thesis to include a measure of the experience of racism in the 2011, 2012 and 2014 Victorian population Health Surveys, and future surveys going forward.

As will be elaborated on in the next section of the discussion, low levels of bridging and linking social capital among Aboriginal and Torres Strait Islander adults in Victoria were indeed found to be associated with experiences of racism (chapter 6), confirming the findings of the other studies across Australia described above.

Low levels of social capital have been shown to be consistently associated with cardiovascular disease and cancer (Pikhart and Pikhartova 2015). A report commissioned by the WHO Regional Office for Europe, reviewed 37 systematic reviews and meta-analyses of studies from across the world that investigated the role of psychosocial factors, including social capital, in morbidity and mortality from cardiovascular disease and cancer (Pikhart and Pikhartova 2015). The authors concluded that the consistency of the findings support the hypothesis that low social support, low trust, social isolation, and various measures of stress such as depression, anger, hostility, and psychological distress are causal risk factors for cardiovascular disease and cancer.

Other studies have shown that psychological distress is a significant risk factor for a range of physical diseases and conditions mediated through over-stimulation of the body's biological response to stress, as well as a range of mental illnesses (Chrousos 2009). The physical diseases and conditions include obesity (discussed earlier in this chapter), diabetes mellitus, metabolic disorder, cardiovascular and cerebrovascular disease, cancer, hypothyroidism, rheumatoid arthritis, asthma, and eczema (Cohen et al. 2007) (Chrousos 2009).

Therefore, developing and implementing interventions to reduce psychological distress directly, or indirectly by addressing its causes such as food insecurity, low socioeconomic status, and low levels of social capital, may improve health and wellbeing outcomes for Aboriginal and Torres Strait Islander adults.

Psychological distress is only mentioned twice in the National Aboriginal and Torres Strait Islander Health Plan 2013–2023 (Commonwealth of Australia 2013). The first occasion refers to "...psychological devastation..." in the context of the policies of previous governments that gave rise to the Stolen Generations. The second reference describes psychological distress as being one of the pathways from racism in the healthcare sector to ill-health. However, there are no references to psychological distress in the accompanying Implementation Plan (Department of Health 2015).

In contrast, the Victorian Korin Korin Balit-Djak: Aboriginal Health, Wellbeing and Safety Strategic Plan 2017–2027 recognises that Aboriginal and Torres Strait Islanders adults disproportionately experience psychological distress and that racism, regardless of where it occurs, is linked to psychological distress (Department of Health and Human Services 2017).

The plan commits to the provision of services to improve social and emotional wellbeing and states that success in 10 years' time would include a reduction in the levels of psychological distress among children and young people. However, an implementation plan remains to be developed and released.

8.3.4 Experiences of racism

While likely to be a substantial underestimate, 17.0% (13.3–21.5%) of Aboriginal and Torres Strait Islander adults in Victoria experienced racism in the 12 months preceding the survey, compared with 4.5% (4.3–4.8%) of non-Aboriginal and Torres Strait Islander adults.

The wider literature consistently shows that experiences of racism are typically underreported (Krieger 2014). Evidence suggests this may be due to the psychologically protective effect associated with minimising personal experiences of racism (Hodson and Esses 2002).

Studies also show that people are more likely to report experiences of racism if the question is phrased to ask about the experiences of the ethnoracial group to which they belong, rather than their personal experiences (Krieger 2014). Moreover, multi-item measures of experiences of racism tend to be more reliable than single-item measures (Krieger et al 2005).

It is important to be cognisant of the fact that racism is a complex phenomenon and reducing it to a single-item question cannot capture its complexity (Paradies and Cunningham 2008).

Consistent with the literature, this research confirmed that experiences of racism may indeed be a barrier to the development of both bridging and linking social capital among Aboriginal and Torres Strait Islander adults.

Aboriginal and Torres Strait Islander adults with low bridging social capital were almost 4 times as likely as those with high bridging social capital to have experienced racism in the 12 months preceding the survey interview—OR = 3.6 (3.1–4.1). Similarly, Aboriginal and Torres Strait Islander adults with low linking social capital were more than twice as likely as those with high linking social capital to have experienced racism—OR = 2.4 (2.0–2.7).

Therefore, experiences of racism are associated with lower levels of bridging and linking social capital and both experiences of racism and lower levels of social capital are associated with psychological distress.

These findings are consistent with the hypothesis that experiences of racism may be an important psychosocial risk factor for Aboriginal and Torres Strait Islander adults that negatively impacts on health through causing psychological distress.

It is also hypothesised that experiences of racism may be an important barrier to bridging and linking social capital, exemplifying the complexity and multiple pathways by which the social determinants may impact on Aboriginal and Torres Strait Islander health and wellbeing.

This research found evidence of atypical socioeconomic gradients in experiences of racism where experiences of racism increased with increasing socioeconomic status. This has been similarly reported in other studies described in the literature review of chapter 1.

A literature review of studies that investigated the relationship between a measure of socioeconomic status and a health risk, outcome or action among Aboriginal and Torres Strait Islander Australians, concluded that unlike non-Aboriginal and Torres Strait Islander Australians, the socioeconomic patterning of health among Aboriginal and Torres Strait Islander populations is less universal and less consistent (Shepherd et al. 2012).

Shepherd et al (2012) noted that there is an overrepresentation of Aboriginal and Torres Strait Islander peoples in the lower levels of all measures of socioeconomic status which may reduce the statistical power to detect socioeconomic gradients. Alternatively, or additionally, if those of higher socioeconomic status are more likely to experience racism, one might hypothesise that the health benefits associated with higher socioeconomic status may be attenuated or cancelled out through greater exposure to racism and its health-damaging effects.

Further research is clearly needed, and one must be extremely cautious in suggesting that there may be no health gains to be had by improving the socioeconomic status of Aboriginal and Torres Strait Islanders, as such claims could be used to justify government inaction. Moreover, even if the hypothesis were proven, the current failure of the Closing the Gap strategy to improve health outcomes can hardly be blamed on its current focus to improve the education and employment outcomes since there has been little if any improvement in those outcomes since the strategy began.

However, these findings do merit consideration and provide support for further research and action on racism, especially if racism is a barrier to the health-promoting effects of socioeconomic advantage.

Racism as is defined here consists of: "... *organized systems within societies that cause avoidable and unfair inequalities in power, resources, capacities and opportunities across racial or ethnic groups*" (Paradies et al. 2015). Racism can be internalised—whether it is an individual who believes that their ethnic group is superior to another ethnic groups or vice versa. It can be interpersonal, where the interactions between people serve to maintain or exacerbate the unequal distribution of opportunity and resources across racial or ethnic groups. It can also be structural, also known as systemic or institutional racism, where a society fosters discrimination through its housing, employment, criminal justice, education, media, social welfare, and healthcare systems (Paradies et al. 2008) (Bailey et al. 2017).

The work presented in this thesis is limited to interpersonal racism as it measures the individual's experiences. These experiences of racism are often referred to in the literature as 'perceived racism' because they are self-reported therefore subjective. However, not all data lends itself well to objective measurement, such as experiences of racism.

Moreover, there is evidence that it is the perception of interpersonal racism that is harmful to health (Pascoe and Smart Richman 2009). Although, that may not be the case with systemic racism as evidenced by studies that consistently show that Aboriginal and Torres Strait

Islander patients are significantly less likely to receive appropriate medical care compared with non-Aboriginal and Torres Strait Islander patients with the same level of medical need, and that this results in poorer health outcomes (Paradies et al. 2008). Despite these findings, they were not matched by the perceptions of Aboriginal and Torres Strait Islander peoples of experiences of racism in healthcare settings, where one study found that only 4% of Aboriginal and Torres Strait Islander Australians indicated that they felt they were treated worse than their non-Aboriginal and Torres Strait Islander counterparts, while 90% reported being treated equally (Paradies et al. 2018).

Irrespective of the type of racism experienced and how it is measured, a growing number of systematic reviews and meta-analyses consistently show that racism is a significant health risk factor for both the mental and physical health of indigenous and minority populations across the world, including Australia (Pascoe and Smart Richman 2009) (Schmidt et al. 2014) (Paradies et al. 2015).

There is also an abundance of literature that provides consistent and compelling evidence on the various mechanisms by which racism may damage health and wellbeing, both directly and indirectly (Harrell et al. 2011) (Williams and Mohammed 2013) (Paradies et al. 2015):

Indirect pathways

1. Systemic racism in the employment market, housing sector, and education system leads to higher rates of unemployment, poor quality overcrowded housing, and lower educational attainment resulting in low socioeconomic status and poverty. Low socioeconomic status and poverty are associated with poor mental and physical health.
2. Racism decreases participation in healthy behaviours such as sleep and exercise, and increases participation in unhealthy behaviours such as smoking, consumption of alcohol and overeating, as a means of coping.
3. Systemic racism in the mainstream healthcare system causes reluctance to seek medical care leaving conditions unattended for too long, resulting in adverse health outcomes.
4. Maternal exposure to racism elicits a physiological stress response that impacts on the uterine environment and epigenetic activity, causing subtle but harmful effects on a foetus that can be maintained into adulthood.

Direct pathways

1. Repeated and frequent experiences of racism act as a chronic stressor that over-stimulates the body's natural responses to stress—the SAM and HPA axes, referred to earlier in this chapter. In a normal situation, exposure to an acute stressor stimulates the SAM and HPA axes to release adrenaline and cortisol, respectively. This prepares the body to 'fight or flee' from a potential threat by increasing the heart rate, respiration, blood pressure, alertness of the brain, and blood glucose. While these are important short-term physiological responses to ensure survival, chronic stimulation of the SAM and HPA axes over time causes long-term pathological changes of multiple systems, including the hormonal and immune systems, resulting in allostatic load.

2. Racism causes adverse cognitive and emotional responses that are associated with psychopathology, such as depression and anxiety.
3. Racism can result in physical injury as a result of racially-motivated violence.

Examination of the multiple pathways by which racism may negatively impact on health and wellbeing provides in itself evidence of a central and pivotal role of racism as a determinant of health inequalities experienced by indigenous populations in settler colonial countries such as Australia.

The final investigation of this thesis was a risk factor analysis that compared the contribution of the social determinants of experiences of racism and socioeconomic status with the behavioural risk factors of smoking, alcohol consumption, unhealthy body weight, and physical inactivity to the gap in self-reported health status between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults.

Experiences of racism and smoking made the largest contribution to the gap explaining 34% and 32% of the gap, respectively. Together, experiences of racism and smoking explained 58% of the gap. Thus, the contribution of experiences of racism to the gap in self-reported health status was largely independent of, but equivalent in strength to smoking.

Socioeconomic status, measured by total annual household income, only explained 15% of the gap, confirming the findings in the literature that show that the socioeconomic patterning of health among Aboriginal and Torres Strait Islander populations is less universal and less consistent.

Since this investigation primarily measured interpersonal experiences of racism, it is hypothesised that interpersonal racism may act as a proximate determinant of health through its action as a psychosocial stressor or risk factor. However, this does not preclude concomitant role(s) of racism as a distal determinant of health and wellbeing reflecting the existence of systemic racism.

Based on the literature and the findings of this thesis, a conceptual model of the key role that racism directed towards Aboriginal and Torres Strait Islander adults has in damaging health and wellbeing is proposed in the next section of the discussion.

Briefly commenting on the federal government's Closing the Gap strategy, the National Aboriginal and Torres Strait Islander Health Plan 2013–2023 explicitly recognises the health-harming effects of racism and commit to eradicating racism in the healthcare sector (Commonwealth of Australia 2013). However, as previously discussed in section 8.2.5, it only seeks to address racism within the healthcare sector, and it appears that there are very few instances of any action actually having been taken (Fisher et al. 2016) (The Lowitja Institute 2020).

In contrast, the Victorian Korin Korin Balit-Djak: Aboriginal Health, Wellbeing and Safety Strategic Plan 2017–2027 seeks to address racism more broadly (Department of Health and Human Services 2017). The plan discusses eliminating racism in the Department of Health and Human Services as well as in the healthcare sector. It also seeks to eliminate racism in Victorian sports and recreation. However, an implementation plan remains to be developed and released.

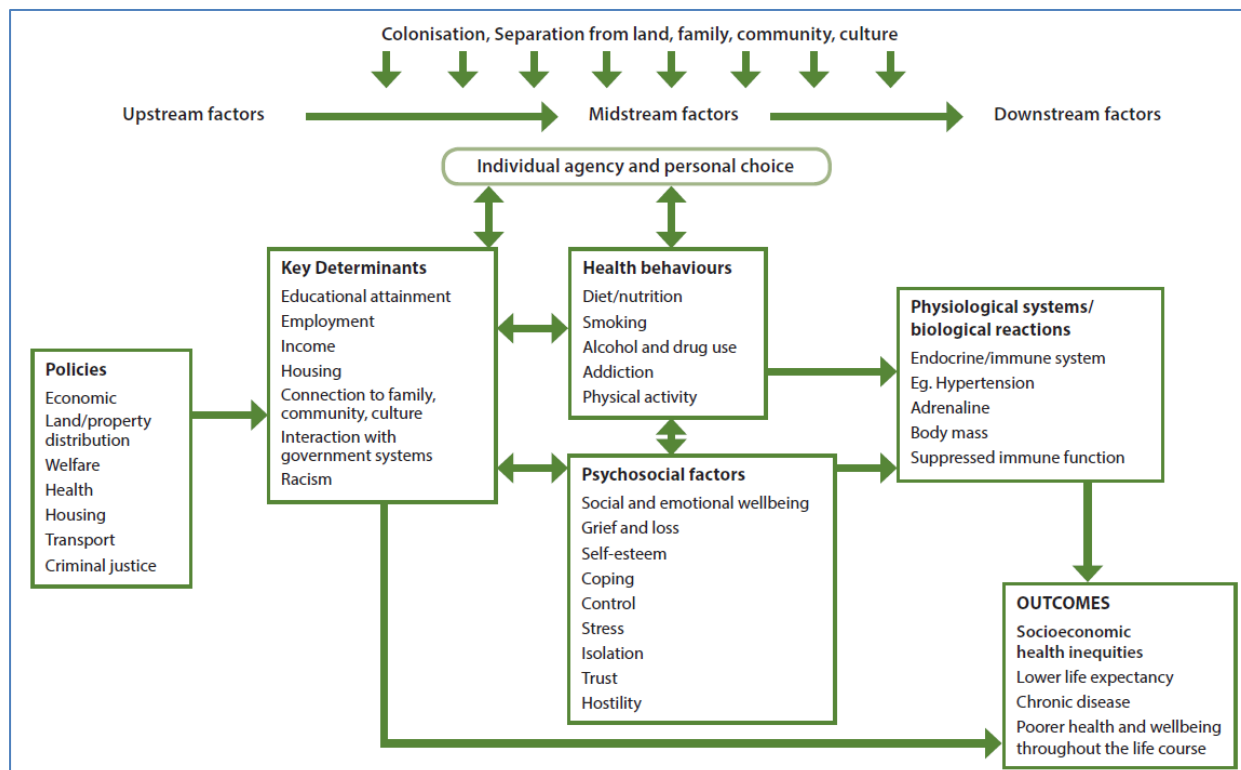
8.3.5 Models of the social determinants of health and health inequalities of Aboriginal and Torres Strait Islander adults

AIHW model

In 2013, the Australian Institute of Health and Welfare (AIHW) published a report entitled: *What works? A review of actions addressing the social and economic determinants of Indigenous health* (Osborne and Brown 2013). In the report they present a conceptual model of the social determinants of Aboriginal and Torres Strait Islander health and health inequalities (Figure 8.1).

The authors present the historical context of colonisation as the central driver of the social, economic, and health inequalities experienced by Aboriginal and Torres Strait Islander Australians. They go on to list the following social and economic determinants as particularly salient to the daily lives of Aboriginal and Torres Strait Islander Australians: educational attainment; connection to family; community, country and culture; employment; housing; racism; and interactions with government systems, specifically within the healthcare and criminal justice systems (Osborne and Brown 2013). This model was informed by the seminal work commissioned by the Cooperative Research Centre for Aboriginal Health in 2004 to identify the social determinants of Aboriginal and Torres Strait Islander health (Carson et al. 2007).

Figure 8.1: Conceptual model of the social determinants of Aboriginal and Torres Strait Islander health and health inequalities (Australian Institute of Health and Welfare 2016)



The AIHW model recognises the importance of experiences of racism, as a psychosocial risk factor, its impact on health behaviours, and its direct impact on socioeconomic outcomes that impact on health. However, the picture is incomplete. For example, colonisation was justified on the basis of racist beliefs about the original inhabitants. Moreover, the process of colonisation is represented as being historical which many would argue is an ongoing process that is both created and reinforced by racism. In addition, the AIHW model fails to distinguish between the different types of racism.

Proposed model

The following model is proposed to better explain health inequalities among Aboriginal and Torres Strait Islander Australians. While this research was specifically confined to Aboriginal and Torres Strait Islander adults who live in Victoria, it is suggested that the model may be more broadly applicable.

The social determinants that the model refers to include the 10 social determinants identified by the WHO and the social determinants associated with the colonisation of Australia, identified by work sponsored by the Cooperative Research Centre for Aboriginal Health (CRCAH) in 2004 (World Health Organization 2008) (Carson et al. 2007).

The WHO social determinants include socioeconomic status, stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport (World Health Organization 2008).

The CRCAH social determinants include poverty, social class, education and training, employment, income, racism, marginalisation, incarceration, the justice system, housing, infrastructure, family separation, history and health, cultural genocide, assimilation, and transgenerational trauma (Carson et al. 2007).

The model places racism in a pivotal role where it both creates and reinforces inequalities in health and wellbeing between Aboriginal and Torres Strait Islander Australians. Racism acts as both a distal and a proximate social determinant that harms health and wellbeing at multiple points along the causal pathway and through multiple mechanisms.

For example, given that 75% of non-Aboriginal and Torres Strait Islander adults have been shown to hold implicit bias against Aboriginal and Torres Strait Islander Australians, it is likely this influences government policy-making (Shirodkar 2019). In 2013, the Federal Government introduced the cashless welfare card which quarantines up to 80% of the payments to recipients of income support payments (Henriques-Gomes 2020a). Its purpose is to prevent “welfare-fuelled alcohol, gambling and drug misuse”. However, the card is issued to all income support recipients regardless of whether they have a history of gambling, alcohol or drug misuse, and the card has only been trialled almost exclusively in Aboriginal and Torres Strait Islander communities.

The supposed benefits of the cashless welfare card are strongly contested by welfare groups and Aboriginal and Torres Strait Islander organisations who argue that the card is discriminatory and not adequately supported by the evidence.

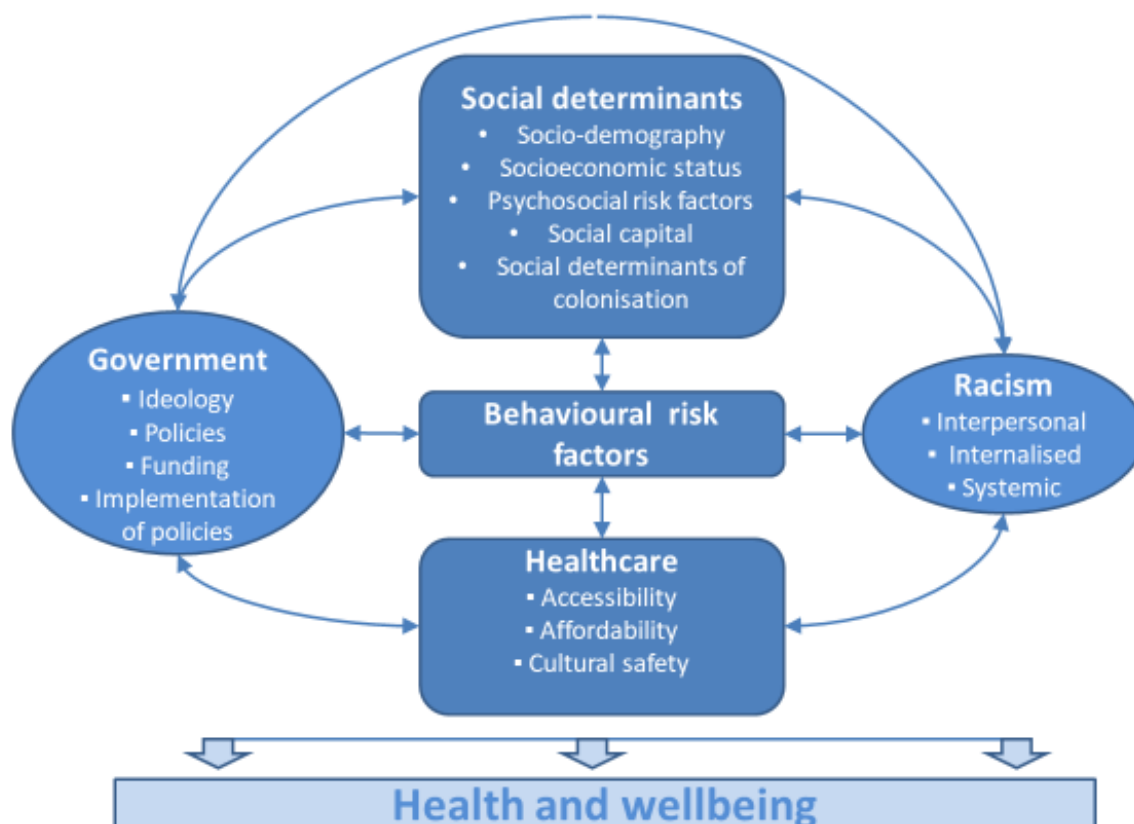
This was confirmed by a study conducted by researchers from the University of South Australia and Monash University who found that the card did not reduce gambling, drug, or alcohol abuse (Henriques-Gomes 2020b). Moreover, there is evidence that the card is harmful as it stigmatises the card holders who report experiencing shame and embarrassment and higher levels of interpersonal racism. This in turn causes psychological distress which may negatively impact on health through the increased uptake of health-harming coping mechanisms, such as comfort eating or smoking, as well as chronically stimulating the SAM and HPA axes.

Despite the lack of evidence of effectiveness and the existence of evidence to the contrary that it may be harmful to health and wellbeing, the Federal Government seeks to make the card permanent and to increase its use in other predominantly Aboriginal and Torres Strait Islander communities across Australia (Moussalli and Nadge 2020).

Following on with the proposed model, the increased uptake of health-damaging behaviours to cope with the stress caused by the card and the failure to reduce alcohol, gambling and drug misuse is likely to be viewed negatively by non-Aboriginal and Torres Strait Islander Australians. The consequence would be to reinforce existing negative stereotypes that in turn reinforce racism and potentially lead to the development of new policies aimed at

counteracting those behaviours, thus creating a never-ending cycle that fails to improve Aboriginal and Torres Strait Islander health and wellbeing.

Figure 8.2: Proposed conceptual model of the social determinants of Aboriginal and Torres Strait Islander health and health inequalities



The potential implications and applications of the proposed model are:

- To highlight the importance of measuring racism and its inclusion in the population health surveys of all states and territories as part of routine reporting of health status
- To provide a theoretical framework for exploring the impact of social determinants of health and racism on the health and wellbeing of Aboriginal and Torres Strait Islander populations
- To facilitate analyses that evaluate the impact of racism on Aboriginal and Torres Strait Islander health and wellbeing
- To assist in developing public health and health system interventions at the population level that focus on addressing racism in all its forms

- To support the design and conduct of epidemiologic studies that explore the potential impacts of racism and other social determinants of health on the health and wellbeing of Aboriginal and Torres Strait Islander peoples
- To put the contribution of the behavioural risk factors to Aboriginal and Torres Strait Islander health and wellbeing into a realistic context, given the current, almost sole focus on addressing the behavioural risk factors at the expense of the social determinants of health.
- By putting the behavioural risk factors into context, this may in itself help to reduce interpersonal, internalised and systemic racism over time, as well as redirect the thinking that currently underlies and guides governmental policy-making.
- May help to counteract deficit discourse by highlighting the contribution of the non-Aboriginal and Torres Strait Islander population to the inequalities in health and wellbeing experienced by the Aboriginal and Torres Strait Islander population.

8.4 Strengths and limitations

Each of the publications arising from the results chapters details the strengths and limitations of the research. The following summarises the strengths and limitations that apply to all of the publications.

8.4.1 Strengths

This thesis was based on data from the Victorian Population Health Survey—a well-validated, population-representative survey, with a high response rate. To the best of this author’s knowledge, this is the first population-representative investigation of the determinants of the gap in health and wellbeing between an Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander population, that included the social determinants of health. It is certainly the first conducted in the Australian state of Victoria.

The Victorian Population Health Survey has been conducted annually since 2001 and was informed by a peer-reviewed public health model of the social determinants of health (Ansari et al. 2003). Therefore, it is an unusual health survey in that it is rich in data on the social determinants of health. In contrast, most health surveys across the country, including the national health surveys, tend to be informed by the biomedical model of health and therefore collect very little data on the social determinants of health.

The Victorian Population Health Survey includes both Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander survey respondents. This enables the measurement of inequalities in the health and wellbeing, as well as inequalities in the determinants of health and wellbeing, between Aboriginal and Torres Strait Islander adults

and their non-Aboriginal and Torres Strait Islander counterparts. In short, it allows investigation of the 'gap' within the same survey, hence maximising comparability.

In contrast, the national health surveys conducted by the Australian Bureau of Statistics (ABS), run separate surveys for the Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander populations.

While the ABS do make limited comparisons between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander Australians by comparing the different surveys with each other, it is important to note that they are limited by methodological differences, the surveys not being conducted in the same year, and only a few questions being identical between the surveys.

The large sample size of the Victoria Population Health Survey enabled detailed descriptive analyses and the application of advanced statistical methods with good precision to investigate the role of racism and other social determinants.

The combination of three Victorian Population Health Surveys (2011, 2012, and 2014), which constituted the dataset used to explore racism as a social determinant, has been shown to be beneficial by reducing sampling error (Schenker and Raghunathan 2007).

Lastly, as a consequence of this thesis, a measure of experiences of racism has now been routinely incorporated into the Victorian Population Health Survey and is reported annually.

8.4.2 Limitations

Limitations include that survey data is cross-sectional, which does not allow for assertions to be made about causality or its direction. However, such data does allow for the development of hypotheses that can be tested in future research.

There is also the possibility of coverage error where adults of very low socioeconomic status are less likely to have participated in the surveys because survey respondents were only eligible if they had a landline telephone connection. However, rather than invalidating the findings, it is more likely that the inequalities observed are underestimated.

Survey data is self-reported data which often raises concerns about accuracy, although this does depend on the question being asked. For example, self-reported health status has been shown to be an accurate and reliable measure of health status that accurately reflects population morbidity and mortality (Perez-Zepeda et al. 2016). In contrast, survey respondents asked about their height and weight tend to overestimate their height and underestimate their weight. This means that obesity prevalence estimates from self-reported data are typically lower than obesity prevalence estimates obtained through actual physical measurement (Magnusson et al. 2014).

But not all data readily lends itself to objective measurement such as experiences of racism (Paradies 2006). The literature suggests that experiences of racism are likely to be

underestimated due to cognitive biases such as social desirability bias, in addition to the well-known psychologically protective effect associated with minimising personal experiences of racism (Bailey et al. 2017) (Hodson and Esses 2002) (Ruggiero and Taylor 1997). Moreover, there is evidence to suggest that it is the perception of interpersonal racism that is harmful to health a wellbeing through the mechanisms previously described in section 8.3.4.

However, in contrast to interpersonal racism, there is also evidence that the perception of racism is not necessary for systemic racism to be harmful to health as was previously discussed in section 8.3.4.

The social determinants measured in the Victorian Population Health Survey largely reflect many of the 10 social determinants (socioeconomic status, stress, early life, social exclusion, work, unemployment, social support, addiction, food, and transport) identified by the WHO. However, few of the social determinants that reflect the past and ongoing process of colonisation were included in the survey, except poverty, education and training, employment, income, and racism. There was no data collected on marginalisation, incarceration, the justice system, housing, infrastructure, family separation, history and health, cultural genocide, assimilation, and transgenerational collective trauma.

Finally, as discussed in the literature review in chapter 1, risk factor analysis is problematic, because the issue of what is or is not included in the analysis is not minor in terms of policy relevance (Watts and Cairncross 2012). This equally applies to the research of this thesis. The omission of risk factors in the risk factor analysis may have overinflated the importance of the risk factors that were included.

8.5 Future directions

As far back as 1994, Dixon and Sindall suggested that Australia's strength in collecting survey and administrative data on individual behaviours and health outcomes may continue to influence its reliance on such data as the basis for government policy-making (Dixon and Sindall 1994). Thus, Australia lags and continues to lag behind other countries in its ability to measure and understand the relationship between the social determinants of health and health outcomes. Therefore, until changes are made to the type of data routinely collected in surveys and administrative datasets, a social determinants approach to policy-making in Australia may remain elusive.

In order to enable further research on the social determinants of food insecurity, psychological distress, and racism, researched in this thesis, such data will need to be collected. This could be done in independently funded academic studies, albeit subject to funding constraints. However, such data should also be incorporated into routine government data collections as the findings from these data collections tend to have a greater chance of influencing government policy-making. State and national population health surveys currently serve as one of the main sources of data that informs policy and decision-making.

Currently, both the Victorian Population Health Survey (VPHS) and the national health surveys routinely include one of the Kessler Psychological Distress Scales to measure psychological distress. However, only the VPHS routinely measures food insecurity, although the national health surveys occasionally include the same question about food insecurity asked in the VPHS.

Due to the advocacy of this author, the Victorian Population Health Survey also now includes a routine question about experiences of racism. However, the evidence shows that a single question about personal experiences of racism significantly underestimates its true prevalence, for a variety of reasons previously discussed in this thesis. Therefore, a recommendation from this thesis would be that, at the very least, an additional question be included that asks about witnessing racism directed against one's own ethnicity. If we fail to measure racism, then there will continue to be a lack of evidence to inform policy to eradicate racism (Fogarty et al. 2018).

Further, another recommendation would be that all types of racism be routinely measured. Arguably, systemic racism may be even more damaging to health and wellbeing than interpersonal racism, as systemic racism creates and reinforces discrimination through its housing, employment, criminal justice, education, media, social welfare, and healthcare systems. Addressing interpersonal racism without addressing systemic racism, which is largely invisible, would seem to be potentially setting up for failure. However, how one would measure and monitor systemic racism may in itself require further research.

This research hypothesises that racism in all its forms, while not the only determinant of importance, occupies a pivotal position in creating and maintaining the gap in Aboriginal and Torres Strait Islander health and wellbeing. In this context the central problem lies outside the Aboriginal and Torres Strait Islander population—with the non-Aboriginal and Torres Strait Islander population. Therefore, routinely measuring and monitoring the beliefs and attitudes of the non-Aboriginal and Torres Strait Islander population should be considered.

Interestingly, measuring the beliefs and attitudes of individuals to people of other ethnicities is one of the best examples of self-reported data that is particularly plagued by social desirability bias. Social desirability bias is the tendency of survey respondents to answer questions in a manner that they believe will be viewed favourably by the survey interviewer (Krumpal 2013). This results in the underreporting of negative beliefs and attitudes and the overreporting of positive beliefs and attitudes.

For example, a national survey conducted in 2014 to determine public opinion on Aboriginal and Torres Strait Islander issues found that 19% of survey respondents, when asked if land rights and government help for Aboriginal and Torres Strait Islander Australians had gone too far, agreed (Gray et al. 2015). This survey was a telephone interview survey. However, the same question was asked by the Australian Election Survey, a mail survey which did not involve personal contact with an interviewer found that 34% of respondents agreed. The large

disparity between the two surveys may reflect, at least in part, the operation of social desirability bias in the telephone survey, calling into question the validity of the findings.

Moreover, a recent study that measured 'implicit bias', also known as unconscious bias, found that approximately 75% of non-Aboriginal and Torres Strait Islander Australians hold an implicit bias against Aboriginal and Torres Strait Islander Australians, with a third holding a strong implicit bias (Shirodkar 2019).

Implicit or unconscious bias is an unconscious belief, feeling, or attitude toward the members of another social group that exists even when these are contrary to the individual's conscious or declared beliefs.

The study used the internationally validated Implicit Association Test to measure the prevalence of implicit bias in approximately 17,000 non-Aboriginal and Torres Strait Islander Australians over a ten-year period from 2009 to 2019 (Shirodkar 2019). The authors concluded that *"Perhaps the reason why policy makers are facing a hard ceiling on progress against the Closing the Gap targets partially reflects the fact that as a society, we have yet to genuinely addressed a significant barrier to Indigenous progress – the potential implicit bias that non-Indigenous Australia holds against them"* (Shirodkar 2019).

These findings highlight the significant challenges that lie ahead in addressing racism. With such a high prevalence of implicit bias in the non-Aboriginal and Torres Strait Islander population, it is unsurprising that the bridging and linking social capital necessary for the Aboriginal and Torres Strait Islander population to overcome the health and wellbeing-damaging impacts of social and economic disadvantage remains elusive.

These findings also highlight the importance of routinely measuring both experiences of racism in the Aboriginal and Torres Strait Islander population and the beliefs and attitudes of the non-Aboriginal and Torres Strait Islander population. However, these findings also indicate that it is implicit or unconscious bias that should be measured to avoid the inaccurate and potentially misleading conclusions that may be reached if modes of data collection that are subject to high levels of social desirability bias are used.

Further research is also needed to understand why socioeconomic gradients are not as strong or consistent among Aboriginal and Torres Strait Islander Australians as they are among non-Aboriginal and Torres Strait Islander peoples. This is particularly relevant for government policy-making because if racism is a barrier to the health-promoting benefits of improved socioeconomic status as the findings in this thesis may suggest, then a change in thinking may be required that necessitates alternative policies and solutions to those currently being advocated in the Closing the Gap strategy.

In addition to the social determinants of food insecurity, psychological distress, and racism, other social determinants and their impact on the gap in Aboriginal and Torres Strait Islander

health should be further researched, particularly the social determinants associated with colonisation. These include poverty, social class, education and training, employment, income, racism, marginalisation, incarceration, the justice system, housing, infrastructure, family separation, history and health, cultural genocide, assimilation, and transgenerational trauma (Carson et al, 2007). This would also require additional questions to be inserted into population health surveys.

The National Aboriginal and Torres Strait Islander Social Survey (NATSISS) does in fact collect quite a lot of data on the social determinants associated with colonisation. However, the NATSISS does not have a non-Aboriginal and Torres Strait Islander comparison group to enable analysis of the impact on these social determinants on the gap in Aboriginal and Torres Strait Islander health and wellbeing.

In terms of the overall research approach to Aboriginal and Torres Strait Islander health and wellbeing going forward, Bond and Singh (2020) note that the National Health Medical and Research Council has yet to significantly invest in a research agenda that would seek to understand the impacts of racism on the health of Aboriginal and Torres Strait Islander peoples and to trial effective interventions (Bond and Singh 2020).

Bond et al (2020) go on to call for all Australian research funding bodies to make an unequivocal financial commitment to funding research “*..that attends to the nature and function of race in producing the conditions that allow racialised health inequalities to persist, from birth to death, including the embodied consequences of racism*” (Bond et al. 2020).

Bond et al (2020) also call for the introduction of new publication guidelines for peer-reviewed journals to require that any research on racialised health inequalities examine the role of systemic racism, rather than socioeconomic disadvantage or other social or cultural factors (Bond et al. 2020).

8.6 Conclusions and policy implications

This research identified food insecurity, psychological distress, and experiences of racism as important social determinants of the gap in health and wellbeing between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander adults who live in the Australian state of Victoria.

Moreover, this research suggests that racism directed against Aboriginal and Torres Strait Islander Victorians is an underlying and unifying aspect of many of the other determinants of health, placing it in a pivotal position. Consequently, a conceptual model to explain the gap in Aboriginal and Torres Strait Islander health and wellbeing is proposed.

The implications of these findings for government policy-making are a significant departure from the thinking that informed the Closing the Gap strategy in the following ways:

(1) It challenges the reliance on and relevance of the biomedical model of health that has dominated epidemiological and medical research since the mid-19th century

(2) It also challenges the Western neoliberal social and economic model that pervades non-Aboriginal and Torres Strait Islander culture and government policy-making, which blames and shames individuals for poor behavioural 'choices' by situating the primary responsibility for health and wellbeing with the individual

(3) Addressing all forms of racism (internalised, interpersonal, and systemic) as both a proximate and distal determinant of 'the gap' shifts responsibility away from the Aboriginal and Torres Strait Islander population to the non-Aboriginal and Torres Strait Islander population. This may help counteract deficit discourse.

(4) Understanding and accepting the pivotal role of racism in damaging the health and wellbeing of Aboriginal and Torres Strait Islander peoples connects other sectors that were previously considered irrelevant to the remit of the health sector. For example, the over-policing and over-incarceration of Aboriginal and Torres Strait Islander Australians is a significant social determinant that causes severe stress and has deleterious impacts on employability, hence reduces future socioeconomic status, all of which negatively impacts on health and wellbeing through multiple pathways described in the proposed model. Thus, while over-policing and over-incarceration are under the remit of the justice sector, they are powerful social determinants of health and wellbeing that require addressing.

However, that is not to suggest that government policy-making to address the gap in Aboriginal and Torres Strait Islander health and wellbeing should be completely redirected to addressing racism. Should a broad-ranging, multisectoral strategy to eliminate all forms of racism be ideally successful, for current generations of Aboriginal and Torres Strait Islander Victorians and Australians the damage has already been done.

Therefore, the goals articulated in the Closing the Gap strategy are still important even if most of the policies and their solutions are contestable. Applying a social determinants lens with an understanding of the pivotal role of racism to the Closing the Gap strategy may help to identify and correct the implicit bias that may have contributed to many of the policies and their solutions.

Nevertheless, in the absence of addressing internalised, interpersonal and systemic racism it is hard to see how the gap in health between Aboriginal and Torres Strait Islander and non-Aboriginal and Torres Strait Islander can ever be closed because by definition racism consists of: "*... organized systems within societies that cause avoidable and unfair inequalities in power, resources, capacities and opportunities across racial or ethnic groups*" (Paradies et al. 2015).

As previously discussed in section 8.2.5, a recent independent review of the Closing the Gap strategy, commissioned by the Department of the Prime Minister and Cabinet found that the

strategy placed too much emphasis on the behaviour of individuals and not enough on the context within which the individual lived, contrary to the guiding principles explicitly stated in the strategy documents (Commonwealth of Australia 2019). This means that effectively lifestyle drift has occurred.

This was raised as a serious concern and another example of deficit discourse which is implicated in the reinforcement of negative racial stereotypes (Bond and Singh 2020) (Fogarty et al. 2018). Given the findings of this thesis, any policy or policy solution that potentially stigmatises Aboriginal and Torres Strait Islanders Australians which could potentially lead to increased racism, is likely to be counterproductive and should therefore be avoided.

The independent review of the Closing the Gap strategy also notes a lack of genuine engagement and empowerment of Aboriginal and Torres Strait Islander communities and their representatives. Therefore, in 2019, when there was a refresh of the strategy, the federal government consulted with a coalition of about 40 Aboriginal and Torres Strait Islander organisations.

However, Bond and Singh (2020) expressed concern that in the absence of a change of approach, these organisations, many of which are dependent on federal funding, run the risk of being blamed for the failure of the Closing the Gap strategy. Similar to what happened in 2004 with the abolition of ATSIC who were held responsible for the lack of improvement in Aboriginal and Torres Strait Islander health, despite health not being in their portfolio (Bond and Singh 2020).

Should failure of the Closing the Gap strategy come to be blamed on Aboriginal and Torres Strait Islander communities and their representatives, this would contribute to the ongoing cycle of deficit discourse, perpetuated by governments and the media, which reinforces race-based stereotypes, contributing to the creation and reinforcement of internalised, interpersonal, and systemic racism, as reflected in the conceptual model proposed in this thesis.

In closing Bond and Singh (2020) state: *“Epidemiological discourses that describe the gap are limited in their ability to close the gap because the mechanism by which the gap is made real — race — is barely understood by the epidemiologist. Rather than acknowledge the structuring effects of race, race is reproduced uncritically in the routine business of the discipline. The reluctance to consider the social and political context in which health and illness are produced, including researched and theorised, is the knowledge gap that is militating against efforts to eliminate the racialised health inequalities that Indigenous people suffer”* (Bond and Singh 2020).

It is the ardent hope of this author that the work presented in this thesis and the peer-reviewed publications emanating from it make a meaningful contribution to the debate and do not constitute another poorly understood epidemiological discourse as described by Bond

and Singh (2020) above. That is why this discussion included a synopsis of government policy-making since the 1967 referendum. Its purpose was to place the research firmly in the context of the past and present social and political context of Australia.

8.7 References

Aboriginal and Torres Strait Islander Commission (1994). "The National Aboriginal Health Strategy: an evaluation 1994." Australian Government, Canberra.

Aboriginal and Torres Strait Islander Social Justice Commissioner. (2004). "Statement on ATSIC." Retrieved 29-May-2020, from <https://humanrights.gov.au/about/news/media-releases/statement-atsic>.

Aboriginal and Torres Strait Islander Social Justice Commissioner (2005). "Social justice report 2005." Report No. 3. Human Rights and Equal Opportunities Commission. Sydney.

Allam, L. (2020a). "'A real turning point': new Closing the Gap agreement to move beyond targets." The Guardian. Online 30-July-2020. The UK Scott Trust.

Allam, L. (2020b). "Closing the Gap prison reduction targets show 'disappointing lack of ambition', lawyers say." The Guardian. Online: 30-July-2020. The UK Scott Trust.

Anderson, I. P. (2006). "Mutual obligation, shared responsibility agreements & indigenous health strategy." Australian and New Zealand Health Policy **3**: 10.

Anderson, I., F. Baum and M. Bentley, Eds. (2007). Beyond bandaids: exploring the underlying social determinants of Aboriginal health. Papers from the social determinants of Aboriginal health workshop, Adelaide, July 2004. I. Anderson, F. Baum and M. Bentley. Cooperative Research Centre for Aboriginal Health (CRCATH). Darwin.

Anderson, P. and R. Wild (2007). "Ampe akelyernemane meke mekarle 'little children are sacred' " Australian Indigenous Law Review **11**(3): 99-100.

Ansari, Z., N. J. Carson, M. J. Ackland, L. Vaughan and A. Serraglio (2003). "A public health model of the social determinants of health." Soz Praventivmed **48**(4): 242-51.

Australians for Native Title and Reconciliation (ANTaR). (2020). "The Redfern Statement. Australians for Native Title and Reconciliation." Retrieved 06-May-2020, from <https://antar.org.au/campaigns/redfern-statement#:~:text=The%20Redfern%20Statement%20is%20an%20Aboriginal%20and%20Torres,than%20any%20top-down%20approach%20from%20a%20disengaged%20government>.

Australian Institute of Aboriginal and Torres Islander Studies (AIATSIS). (2020). "The Stolen Generations." Retrieved 28-June-2020, from <https://aiatsis.gov.au/stolen-generations>.

Bailey, Z. D., N. Krieger, M. Agenor, J. Graves, N. Linos and M. T. Bassett (2017). "Structural racism and health inequities in the USA: evidence and interventions." Lancet **389**(10077): 1453-63.

Baum, F. (2007). "Cracking the nut of health equity: top down and bottom up pressure for action on the social determinants of health." Promotion and Education **14**(2): 90-5.

Biddle, N., M. Howlett, B. Hunter and Y. Paradies (2013). "Labour market and other discrimination facing Indigenous Australians." Australian Journal of Labour Economics **16**(1).

Bond, C. J. and D. Singh (2020). "More than a refresh required for closing the gap of Indigenous health inequality." Medical Journal of Australia **212**(5): 198-9 e191.

Bond, C. J., L. J. Whop, D. Singh and H. Kajlich (2020). "'Now we say Black Lives Matter but ... the fact of the matter is, we just Black matter to them'." Medical Journal of Australia **213**(6): 248-50 e241

Brough, M., C. Bond, J. Hunt, D. Jenkins, C. Shannon and L. Schubert (2006). "Social capital meets identity. Aboriginality in an urban setting." Journal of Sociology **42**(4): 396-411.

Browne-Yung, K., A. Ziersch, F. Baum and G. Gallaher (2013). "Aboriginal Australians' experience of social capital and its relevance to health and wellbeing in urban settings." Social Science and Medicine **97**: 20-8.

Carey, G. (2016). "Re-Conceptualising Public Health Interventions in Government: A Response to Recent Commentaries." International Journal of Health Policy and Management **5**(9): 569-70.

Carson, B., T. Dunbar, R. D. Chenhall and R. Bailie, Eds. (2007). Social determinants of Indigenous health. Crows Nest NSW, Allen and Unwin.

Chrousos, G. P. (2009). "Stress and disorders of the stress system." Nature Reviews Endocrinology **5**(7): 374-81.

Close the Gap Campaign Steering Committee (2013). "Shadow report 2013: On Australian governments' progress towards closing the gap in life expectancy between Indigenous and non-Indigenous Australians." Close the Gap Campaign Steering Committee.

Cohen, S., D. Janicki-Deverts and G. E. Miller (2007). "Psychological stress and disease." Journal of the American Medical Association **298**(14): 1685-7.

Commonwealth of Australia (2013). "National Aboriginal and Torres Strait Islander health plan 2013-2023." Department of Health and Ageing. Canberra.

Commonwealth of Australia (2019). "Closing the Gap Retrospective Review." Department of the Prime Minister and Cabinet. Canberra.

Commonwealth of Australia (2020). "Closing the gap: Prime Minister's report 2020." Department of the Prime Minister and Cabinet. Canberra.

Cooper, D. (2011). "Closing the Gap in cultural understanding: social determinants of health in Indigenous policy in Australia." Aboriginal Medical Services Alliance of the Northern Territory (AMSANT). Darwin.

Dallman, M. F. (2010). "Stress-induced obesity and the emotional nervous system." Trends in Endocrinology and Metabolism **21**(3): 159-65.

Department of Health (2015). "Implementation Plan for the National Aboriginal and Torres Strait Islander health plan 2013-23." Australian Government. Canberra.

Department of Health and Human Services (2017). "Korin Korin Balit-Djak: Aboriginal health, wellbeing and safety strategic plan 2017–2027." State of Victoria. Melbourne.

Department of Premier and Cabinet (2018a). "Concept draft. What we have heard: a potential approach for the next Victorian Aboriginal Affairs Framework (VAAF)." State of Victoria. Melbourne.

Department of Premier and Cabinet (2018b). "Victorian Aboriginal Affairs Framework 2018-2023." State of Victoria. Melbourne.

Dinour, L. M., D. Bergen and M. C. Yeh (2007). "The food insecurity-obesity paradox: a review of the literature and the role food stamps may play." Journal of the American Dietetic Association **107**(11): 1952-61.

Dixon, J. and C. Sindall (1994). "Applying logics of change to the evaluation of community development in health promotion." Health Promotion International **9**(4): 297-309.

Dockery, A. M. (2010). "Culture and wellbeing: the case of Indigenous Australians." Social Indicators Research **99**: 315-32.

Dockery, A. M. (2011). "Traditional culture and the wellbeing of Indigenous Australians: An analysis of the 2008 NATSISS." CLMR Discussion Paper Series 2011/01. Centre for Labour Market Research, Curtin University. Perth, Western Australia.

Dunbar, T. and M. Scrimgeour (2007). "Education." Social determinants of Indigenous health. B. Carson, T. Dunbar, R. D. Chenhall and R. Bailie. Crows Nest NSW, Allen and Unwin: 135-52.

Fisher, M., S. Battams, D. McDermott, F. Baum and C. MacDougall (2019). "How the social determinants of Indigenous health became a policy reality for Australia's National Aboriginal and Torres Strait Islander Health Plan." Journal of Social Policy **48**(1): 169-89.

Fisher, M., F. Baum, C. MacDougall, N. L. and D. McDermott (2016). "To what extent do Australian health policy documents address social determinants of health and health equity." Journal of Social Policy **45**(3): 545-64.

Fogarty, W., H. Bulloch, S. McDonnell and D. M. (2018). "Deficit discourse and Indigenous health: how narrative framings of Aboriginal and Torres Strait Islander peoples are reproduced in policy." The Lowitja Institute. Melbourne.

Franklin, B., A. Jones, D. Love, S. Puckett, J. Macklin and S. White-Means (2012). "Exploring mediators of food insecurity and obesity: a review of recent literature." Journal of Community Health **37**(1): 253-64.

Garg, N., B. Wansink and J. Inman (2007). "The influence of incidental affect on consumer's food intake." Journal of Marketing **194**: 194-206.

Gray, A., B. Hunter and S. Lohar (2011). "Increasing Indigenous employment rates." Issues Paper no. 3. Clearing the Gap Clearinghouse. Australian Institute of Health and Welfare & Melbourne: Australian Institute of Family Studies. Canberra.

Gray, M. and W. Sanders (2015). "Australian public opinion on Indigenous issues: injustice, disadvantage and support for recognition." Report No. 17. Centre for Aboriginal Economic Policy Research. Canberra.

Gundersen, C. and H. Seligman (2017). "Food insecurity and health outcomes." The Economists' Voice **14**(1): 1-5.

Gunstone, A. (2008). "Reconciliation and Australian Indigenous health in the 1990s: a failure of public policy." Bioethical Inquiry **5**: 251-263.

Harrell, C., T. Burford, B. Cage, T. Nelson, S. Shearon, A. Thompson and S. Green (2011). "Multiple pathways linking racism to health outcomes." Du Bois Review **8**(1): 143-57.

Headey, D. and H. Alderman (2019). "The relative caloric prices of healthy and unhealthy foods differ systematically across income levels and continents." Journal of Nutrition **149**(11): 2020-33.

Henriques-Gomes, L. (2020a). "'Stigma, shame and frustration': cashless welfare card found to do more harm than good." The Guardian. Online 26-February-2020. The UK Scott Trust.

Henriques-Gomes, L. (2020b). "Cashless welfare card has little impact on gambling, drug and alcohol abuse, study finds." The Guardian. Online 13-November-2020. The UK Scott Trust.

Hodson, G. and V.M. Esses (2002). "Distancing oneself from negative attributes and the personal/group discrimination discrepancy." Journal of Experimental Social Psychology **38**: 500-7.

Houston, S. (1989). "National Aboriginal Health Strategy Working Party." Aboriginal and Islander Health Worker Journal **13**(4): 7-8.

Kawachi, I. and L. F. Berkman (2014). "Social capital, social cohesion, and health." Social epidemiology. L. F. Berkman, I. Kawachi and M. M. Glymour. Oxford University press. New York, NY.

Keating, P. (1992). "Paul Keating's Redfern address." Retrieved 16 April 2019, from <http://www.abc.net.au/archives/80days/stories/2012/01/19/3415316.htm>.

Kettings, C., A. J. Sinclair and M. Voevodin (2009). "A healthy diet consistent with Australian health recommendations is too expensive for welfare-dependent families." Australian and New Zealand Journal of Public Health **33**(6): 566-72.

Krieger, N (2014). "Discrimination and health inequities." Social epidemiology. L.F. Berkman, I. Kawachi, and M.M. Glymour. Oxford university press: New York, NY.

Krieger, N., K. Smith, D. Naishadham, C. Hartman and E. M. Barbeau (2005). "Experiences of discrimination: validity and reliability of a self-report measure for population health research on racism and health." *Social Science and Medicine* **61**(7): 1576-96.

Krumpal, I. (2013). "Determinants of social desirability bias in sensitive surveys: a literature review." *Quality and Quantity* **47**(4): 2025-47.

Laraia, B. A. (2013). "Food insecurity and chronic disease." *Advances in Nutrition* **4**(2): 203-12.

Lee, A. and N. Turner. (2016). "We can close the Indigenous nutrition gap - here's how." Retrieved 20-Nov-2020, from <https://theconversation.com/we-can-close-the-indigenous-nutrition-gap-heres-how-54529>.

Macleod, J. and G. Davey Smith (2003). "Psychosocial factors and public health: a suitable case for treatment?" *Journal of Epidemiology and Community Health* **57**(8): 565-70.

Magnusson, K., I. K. Haugen, N. Osteras, L. Nordsletten, B. Natvig and K. B. Hagen (2014). "The validity of self-reported body mass index in a population-based osteoarthritis study." *BMC Musculoskeletal Disorders* **15**: 442.

Malin, M. and D. Maidment (2003). "Education, Indigenous survival and well-being: emerging ideas and programs." *The Australian Journal of Indigenous education* **32**: 87-100.

Mignone, J. (2009). "Social capital and Aboriginal communities: A critical assessment synthesis and assessment of the body of knowledge on social capital with emphasis on Aboriginal communities." *Journal of Aboriginal Health* **5**(3): 100-47.

Morgan, E. and T. Worsley (2011). "Expert perspectives on fruit and vegetable consumption in Australia." *American Journal of Health Promotion* **26**(1): 10-13.

Moreton-Robinson, A. (2009). "Imagining the good indigenous citizen." *Cultural Studies Review* **15**(2): 61-79.

Morrissey, M. (2006). "The Australian state and Indigenous people 1990-2006." *Journal of Sociology* **42**(4): 347-54.

Moussalli, I, and Nadge, R. (2020). "Australian Government opts to enshrine cashless debit card, or CDC, system for welfare recipients." ABS News. Online 11-October-2020. <https://www.abc.net.au/news/2020-10-11/centrelink-cashless-welfare-card-how-to-christmas-shopping/12751038>

Myers, C. A., E. F. Mire and P. T. Katzmarzyk (2020). "Trends in adiposity and food insecurity among US adults." *JAMA Network Open* **3**(8): e2012767.

National Archives of Australia (2017). "The 1967 referendum - fact sheet 150." Retrieved 01-July-2020, from <http://www.naa.gov.au/collection/fact-sheets/fs150.aspx>.

Osborne, K., B. F. and L. Brown (2013). "What works? A review of actions addressing the social and economic determinants of Indigenous health." Issues paper No. 7. Produced for the Closing the Gap Clearinghouse. Australian Institute of Health and Welfare & Melbourne: Australian Institute of Family Studies. Canberra.

Palmer, K. (2004). "ATSIC: origins and issues for the future. A critical review of public domain research and other materials." Research discussion paper no. 12. Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS), Canberra.

Paradies, Y. (2006). "Defining, conceptualizing and characterizing racism in health research." Critical Public Health **16**: 143-57.

Paradies, Y., J. Ben, N. Denson, A. Elias, N. Priest, P. A., A. Gupta, M. Kelaher and G. Gee (2015). "Racism as a determinant of health: a systematic review and meta-analysis." PLoS one **10**(9): 1-48.

Paradies, Y. and J. Cunningham (2008). "Development and validation of the Measure of Indigenous Racism Experiences (MIRE)." International Journal for Equity in Health **7**: 9-19.

Paradies, Y., R. Harris and I. Anderson (2008). "The impact of racism on Indigenous health in Australia and Aotearoa: towards a research agenda." Discussion Paper No. 4. Cooperative Research Centre for Aboriginal and Tropical Health (CRCATH). Darwin.

Pascoe, E. A. and L. Smart Richman (2009). "Perceived discrimination and health: a meta-analytic review." Psychological Bulletin **135**(4): 531-54.

Parliament of Australia. (2005). "Current Issues Brief no. 4 2004–05. The end of ATSIC and the future administration of Indigenous affairs." Retrieved 26 April 2020, from https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/CIB/Current_Issues_Briefs_2004_-_2005/05cib04#endnotes.

Pérez-Zepeda, M., E. Belanger, M. Zunzunegui, S. Phillips, A. Ylli and J. Guralnik (2016). "Assessing the Validity of Self-Rated Health with the Short Physical Performance Battery: A Cross-Sectional Analysis of the International Mobility in Aging Study." PLoS ONE **11**(4): e0153855.

Pholi, K., D. Black and C. Richards (2009). "Is 'Close the Gap' a useful approach to improving the health and wellbeing of Indigenous Australians?" Australian Review of Public Affairs **9**(2): 1-13.

Pikhart, H. and J. Pikhartova (2015). "The Relationship Between Psychosocial Risk Factors and Health Outcomes of Chronic Diseases: A Review of the Evidence for Cancer and Cardiovascular Diseases." Health Evidence Network (HEN) synthesis report. WHO Regional Office for Europe. Copenhagen.

Priest, N., T. Mackean, E. Davis, E. Waters and L. Briggs (2012). "Strengths and challenges for Koori kids: harder for Koori kids, Koori kids doing well - exploring Aboriginal perspectives on social determinants of Aboriginal child health and wellbeing." Health Sociology Review **12**(2): 165-179.

Ruggiero, K. and D. Taylor (1997). "Why minority group members perceive or do not perceive the discrimination that confronts them: the role of self-esteem and perceived control." Journal of Personality and Social Psychology **72**: 373-89.

SBS News (2020). "Victoria to introduce Australia's first truth-telling process to address Indigenous injustices." Retrieved 25-July-2020, from <https://www.sbs.com.au/news/victoria-to-introduce-australia-s-first-truth-telling-process-to-address-indigenous-injustices>.

Schenker, N. and T. Raghunathan (2007). "Combining information from multiple surveys to enhance estimation of measures of health " Statistics in Medicine **26**: 1802-11.

Schmitt, M., N. Branscombe, T. Postmes and A. Garcia (2014). "The consequences of perceived discrimination for psychological well-being: a meta-analytic review." Psychological Bulletin **140**(4): 921-48.

Seligman, H. K., B. A. Laraia and M. B. Kushel (2010). "Food insecurity is associated with chronic disease among low-income NHANES participants." Journal of Nutrition **140**(2): 304-10.

Shepherd, C., J. Li and S. R. Zubrick (2012). "Social gradients in the health of Indigenous Australians." American Journal of Public Health **102**(1): 107-17.

Shirodkar.S. (2019). "Bias against Indigenous Australians: implicit association test results for Australia." Journal of Australian Indigenous Issues **22**(3-4): 3-34.

The Australian Government Department of the Prime Minister and Cabinet. (2018). "Closing the Gap 2018 - Senator the Hon Michaelia Cash Minister for Jobs and Innovation." Retrieved 04-July-2020, from <https://www.youtube.com/watch?v=n1sUheKYzJo&feature=youtu.be&rel=0&modestbranding=1&autohide=1&showinfo=0>.

The Lowitja Institute (2020). "We nurture our culture for our future, and our culture nurtures us. A report prepared by the Lowitja Institute for the Close the Gap Steering Committee | March 2020." The Close the Gap Campaign Steering Committee.

The Referendum Council (2017). "Final report of the Referendum Council." Commonwealth of Australia. Canberra.

Torres, S. J. and C. A. Nowson (2007). "Relationship between stress, eating behavior, and obesity." Nutrition **23**(11-12): 887-94.

Victorian Treaty Advancement Commission (2018). "About the Commission." Retrieved 25-July-2020, from <https://victtreatyadvancement.org.au/about-commission>.

Watts, C. and S. Cairncross (2012). "Should the GBD risk factor rankings be used to guide policy?" Lancet **380**(9859): 2060-1

Williams, D. R. and S. A. Mohammed (2013). "Racism and Health I: Pathways and Scientific Evidence." American Behavioral Scientist **57**(8): 1152-73.

World Health Organization (2003). "Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation." WHO Technical Report Series. World Health Organization. Geneva.

World Health Organization (2008). "Closing the gap in a generation: health equity through action on the social determinants of health." Final report of the Commission on the Social Determinants of Health. World Health Organization. Geneva.

APPENDIX

Table 1 summarises the variables investigated in the course of this thesis and lists verbatim the questions that were asked of the participants in the Victorian Population Health Surveys (VPHS) from which the variables were derived.

Table 2 summarises all the VPHS questions on the consumption of alcohol asked between 2008 and 2014.

The National Health and Medical Research Council (NHMRC) provides guidance on the consumption of alcohol which is periodically updated. Over the course of this thesis, the NHMRC revised the 2001 Australian alcohol guidelines in 2009. Accordingly, the Victorian Population Health Survey adjusted the questions routinely asked about alcohol consumption in 2012 and began reporting against the 2009 *Australian guidelines to reduce health risks from drinking alcohol* in 2014.

Table 3 summarises the questions asked in the VPHS on physical activity. From the responses to the questions, the total amount of time and sessions of physical activity for each survey participant was subsequently computed and compared against the 1999 *National physical activity guidelines for adults* (Department of Health and Ageing 1999). The level of physical activity of each survey participant was then categorised as follows:

Amount of physical activity	Physical activity level
0 minutes	Sedentary
Less than 150 minutes	Insufficient
150 minutes or more but fewer than 5 sessions per week	Insufficient
150 minutes or more and five or more sessions	Sufficient

Table 4 summarises the 10 questions of the Kessler 10 Psychological Distress Scale.

Table 1: Victorian Population Health Survey questions

Data variable (in alphabetical order)	Survey question	Response options ^a	Chapter(s)
Aboriginal and Torres Strait Island status	Are you of Aboriginal or Torres Strait Islander origin?	1. No, not Aboriginal or Torres Strait Islander 2. Yes, Aboriginal 3. Yes, Torres Strait Islander 4. Yes, Aboriginal and Torres Strait Islander	3–7
Alcohol consumption	See Table 2.		3, 4, 6, 7
Arthritis	Have you ever been told by a doctor that you have arthritis?	1 = Yes; 2 = No	3
Asthma	1. Have you ever been told by a doctor that you have arthritis? 2. In the last 12 months, have you had asthma symptoms (wheezing, coughing, shortness of breath, chest tightness?)	1 = Yes; 2 = No	3
Body mass index ^{b c}	1. How tall are you without shoes? 2. How much do you weigh?	Height could be given in centimetres of feet and inches Weight could be given in kilograms or stones and pounds	3, 4, 6, 7
Cancer	Have you ever been told by a doctor that you have cancer?	1 = Yes; 2 = No	3
Depression and anxiety	Have you ever been told by a doctor that you have depression or anxiety?	1 = Yes; 2 = No	3
Discrimination ^d	1. In the last 12 months, were you treated unfairly because you are an Aboriginal or a Torres Strait Islander? 2. In the last 12 months, have you experienced discrimination or been treated unfairly because of your racial, ethnic, cultural, or religious background?	1 = Yes; 2 = No 1. Never 2. Less than once a year 3. A few times a year 4. A few times a month 5. At least once a week 6. Almost every day	6, 7

Table 1: Victorian Population Health Survey questions *continued*

Data variable (in alphabetical order)	Survey question	Response options ^a	Chapter(s)
Education	What is the highest level of education and training you have completed?	1. Never attended school 2. Some primary school 3. Completed primary school 4. Some high school 5. Completed high school (i.e. Year 12) 6. TAFE or Trade Certificate or Diploma 7. University or some other Tertiary Institute degree 8. Other (Specify _____)	5, 6
Employment status	Which of these best describes your current employment status?	1. Self employed 2. Employed for wages, salary or payment in kind 3. Unemployed 4. Engaged in home duties 5. A student 6. Retired 7. Unable to work 8. Other (Specify)	3, 5, 6
Financial stress	If you needed to, could you raise \$2,000 within 2 days in an emergency? -this includes accessing 'own' savings, borrowing money, or using a credit card / bank card.	1 = Yes; 2 = No	3, 5
Food security	In the last 12 months, were there any times that you ran out of food, and couldn't afford to buy more?	1 = Yes; 2 = No	4, 5

Table 1: Victorian Population Health Survey questions *continued*

Data variable (in alphabetical order)	Survey question	Response options ^a	Chapter(s)
Fruit and vegetable intake ^e	<p>1. How many serves of vegetables do you usually eat each day? A 'serve' is ½ cup of cooked vegetables or 1 cup of salad vegetables.</p> <p>2. How many serves of fruit do you usually eat each day? A 'serve' is 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces.</p>	Number of serves reported	3
Health care	<p>1. In the last 2 years have you had any of these check-ups or tests conducted by a doctor or other health professional: (a) a blood pressure check; (b) a blood test for cholesterol; and (c) a test for diabetes or high blood sugar levels?</p> <hr/> <p>2. Have you or any members of your close family in the past 12 months been to a Victorian Public Hospital for a medical problem?</p> <hr/> <p>3. In the last year, have you sought professional help for a mental health related problem?</p> <hr/> <p>4. In the last 12 months, have you ever seen someone who specialises in eyes, for example, an optician, optometrist, ophthalmologist (specialist eye doctor) or eye clinic?</p> <hr/> <p>5. In the last two years have you had a bowel examination to detect bowel cancer?</p>	1 = Yes; 2 = No	3

Table 1: Victorian Population Health Survey questions *continued*

Data variable (in alphabetical order)	Survey question	Response options ^a	Chapter(s)
Household composition	Which of these BEST describes your household?	1. Couple only 2. Couple with dependent children 3. Couple with non-dependent children 4. One parent family with dependent children 5. One parent family with non-dependent children 6. Group household, or 7. One person household 8. Other	4
Hypertension	Have you ever been told by a doctor that you have high blood pressure?	1 = Yes; 2 = No	3
Neighbourhood tenure	How long have you lived in your current neighbourhood?	1. Less than 1 year 2. Greater than one year but less than or equal to 5 years 3. Greater than 5 years but less than or equal to 10 years 4. Greater than 10 years	3, 5
Physical activity	See Table 3.		3, 6
Psychological distress	See Table 4		3, 5
Self-reported health status	In general, would you say your health is...?	1. Excellent 2. Very good 3. Good 4. Fair 5. Poor	3, 7

Table 1: Victorian Population Health Survey questions *continued*

Data variable (in alphabetical order)	Survey question	Response options ^a	Chapter(s)
Smoking	1. Which of the following best describes your smoking status?	1. I smoke daily 2. I smoke occasionally 3. I don't smoke now, but I used to 4. I've tried it a few times but never smoked regularly 5. I've never smoked	3, 4, 6, 7
	2. Over your lifetime would you have you smoked at least 100 cigarettes or a similar amount of tobacco?	1 = Yes; 2 = No; 3 = Don't know; 4= Refused to say	
Social capital - community participation	Are you a member of a: (a) sports group; (b) church group; (c) school group; (d) professional group or academic society; or any other community or action group (not including a union)?	1 = Yes; 2 = No	3
Social capital - social environment	1. Can you get access to community services or resources, like libraries, maternal and child health centres and neighbourhood centres, when you need them?	1 = No, not at all; 2 = Not often; 3 = Sometimes; 4 = Yes; definitely	3
	2. How many people did you talk to yesterday?	1 = None at all; 2 = Less than 5; 3 = 5 to 9; 4 = 10 or more	5
	3. How would you rate the area in which you live for Having easy access to recreational and leisure facilities such as parks, bike tracks and recreational areas?	1 = very poor; 2 = poor; 3 = Average; 4 = Good; 5 = Very good. Very poor	5
	4. How would you rate the area in which you live for having good facilities and services like shops, childcare, schools and libraries?		5
	5. How would you rate the area in which you live for opportunities to volunteer in local groups?		5

Table 1: Victorian Population Health Survey questions *continued*

Data variable (in alphabetical order)	Survey question	Response options ^a	Chapter(s)
Social capital - social environment	6. How would you rate the area in which you live for a wide range of community and support groups?	1 = very poor; 2 = poor; 3 = Average; 4 = Good; 5 = Very good. Very poor	5
	7. How would you rate the area in which you live for being an active community - people do things and get involved in local issues and activities?		5
	8. How would you rate the area in which you live for Being a pleasant environment - nice streets, well planned, open spaces?		5
Social capital - social support	1. Can you get help from family members when you need it?	1 = No, not at all; 2 = Not often; 3 = Sometimes; 4 = Yes; definitely	3, 4, 5, 6
	2. Can you get help from friends when you need it?		
	3. Can you get help from neighbours when you need it?		
Social capital - social support	Have you been to any support group meetings over the last 2 years?	1 = Yes; 2 = No	3
Social capital - social and civic trust	1. Do you feel safe walking alone down your street after dark?	1 = No, not at all; 2 = Not often; 3 = Sometimes; 4 = Yes; definitely; 5 = Not applicable (for question 1 only)	3, 5, 6
	2. Do you agree that most people can be trusted?		
	3. Do you feel valued by society?		
	4. Do you feel there are opportunities to have a real say on issues that are important to you?		

Table 1: Victorian Population Health Survey questions *continued*

Data variable (in alphabetical order)	Survey question	Response options ^a	Chapter(s)
Total annual household income	Before tax is taken out, which of the following ranges best describes your household's approximate income, from all sources, over the last 12 months?	1. Less than \$10,000 2. \$10,000–\$20,000 3. \$20,001–\$30,000 4. \$30,001–\$40,000 5. \$40,001–\$50,000 6. \$50,001–\$60,000 7. \$60,001–\$70,000 8. \$70,001–\$80,000 9. \$80,001–\$90,000 10. \$90,001–\$100,000 11. Greater than \$100,000	3–7

^a All questions automatically include 'don't know' and 'refused to say' response options.

^b Body mass index (BMI) was calculated using the following formula: $BMI = \text{weight in kg} / (\text{height in metres})^2$.

^c Body weight status was determined using the recommendations of the WHO where underweight = BMI < 18.5; normal weight = BMI of 18.5–24.9; overweight = BMI of 25.0–29.9; obese = BMI = 30.0 or higher (World Health Organization 2000)

^d Discrimination question #1 was asked in the 2011 and 2012 Victorian Population Health Surveys (VPHS) and question #2 was asked in the 2014 VPHS.

^e The 2003 Australian guidelines recommend a minimum daily vegetable intake of four serves for persons aged 12–18 years and five serves for persons aged 19 years or over, where a serve is defined as half a cup of cooked vegetables or a cup of salad vegetables. The recommended minimum daily fruit intake is three serves for persons aged 12–18 years and two serves for persons aged 19 years or over, where a serve is defined as one medium piece or two small pieces of fruit or one cup of diced pieces.

Table 2: Victoria Population Health Survey questions on alcohol consumption

Survey questions: in the last 12 months...	Response options ^a
1. Have you had an alcoholic drink of any kind?	1 = Yes; 2 = No
2. How often did you have an alcoholic drink of any kind?	1. Every day 2. 5 to 6 days a week 3. 3 to 4 days a week 4. 1 to 2 days a week 5. 2 to 3 days a month 6. About 1 day a month 7. Less often than 1 day a month 8. No longer drink 9. Do not drink
3. On a day that you have an alcoholic drink, how many standard drinks ^b do you usually have?	1. 13 or more drinks 2. 11 to 12 drinks 3. 7 to 10 drinks 4. 5 to 6 drinks 5. 3 or 4 drinks 6. 1 or 2 drinks
4. How often would you have more than six (for males only) / four (for females only) standard drinks in a day? ^c	1. Everyday 2. 4 to 6 days a week 3. 2 to 3 days a week 4. About 1 day a week 5. 2 to 3 days a month 6. About 1 day a month 7. Less than once a month 8. Never
5. In the last 12 months, how often did you have more than TWO standard drinks in a day? ^d	Every day 2. Number of days per week given (Specify) 3. About 2 to 3 days per month 4. About 1 day per month 5. Less often than 1 day a month 6. Never
6. How often did you have more than FOUR standard drinks in a day? ^e	Same response options as in question #5
7. How often did you have more than SIX standard drinks in a day? ^e	Same response options as in question #5
^a All questions automatically include 'don't know' and 'refused to say' response options. ^b A standard drink is equal to 1 pot of full strength beer, 1 small glass of wine or 1 pub-sized nip of spirits. ^c Based on the 2001 National Health and medical Research Council (NHMRC) guidelines. ^d The NHMRC revised the national guidelines on consumption of alcohol in 2009. Amongst the changes was a reduction in the maximum number of standard drinks consumed on any occasion that was considered to be of low risk to health. The reduction was from 6 and 4 standard drinks for men and women, respectively, to 2 standard drinks on any occasion for both sexes. This necessitated the addition of a new question in the 2012 Victorian Population Health Survey that replaced question #4. ^e Included in the Victorian Population Health Survey from 2012 onwards.	

Table 3: Victoria Population Health Survey questions on physical activity

Survey questions: in the last week...	Response options ^a
1. How many times have you walked continuously, for at least 10 minutes, whether for recreation, exercise or to get to or from places?	Number of occasions recorded
2. What do you estimate was the total time that you spent walking in this way in the last week?	Time could be recorded in minutes or hours
3. In the last week, how many times did you do vigorous household chores that made you breathe harder or puff and pant, not including gardening?	Number of occasions recorded
4. What do you estimate was the total time you spent doing these vigorous household chores in the last week?	Time could be recorded in minutes or hours
5. This question excludes household chores or gardening. In the last week, how many times did you do any vigorous physical activity that made you breathe harder or puff and pant? (for example, tennis, jogging, cycling, keep fit exercises).	Number of occasions recorded
6. What do you estimate was the total time that you spent doing this vigorous physical activity in the last week?	Time could be recorded in minutes or hours

^a All questions automatically include 'don't know' and 'refused to say' response options.

Table 4: The Kessler Psychological Distress Scale

The Kessler 10 Psychological Distress Scale ^a questions: in the last four weeks...	Response options ^b and scores ^c assigned to response
1. How often did you feel tired out for no good reason?	None of the time = 1
2. How often did you feel nervous?	A little of the time = 2
3. How often did you feel nervous?	Some of the time = 3
4. How often did you feel so nervous that nothing could calm you down?	Most of the time = 4
5. How often did you feel hopeless?	All of the time = 5
6. How often did you feel restless or fidgety?	
7. How often did you feel so restless that you could not sit still?	
8. How often did you feel depressed?	
9. How often did you feel everything was an effort?	
10. How often did you feel so sad that nothing could cheer you up?	

^a See Andrews and Slade 2001 and Kessler et al. 2002.

^b All questions automatically include 'don't know' and 'refused to say' response options.

^c A total score is computed by summing the scores of all 10 questions. A total score of less than 16 is categorised as low psychological distress, a score of 16–21 is categorised as moderate psychological distress, a score of 22–29 is categorised as high psychological distress, and a score of 30 or more is categorised as very high psychological distress.

References:

Andrews, G and T. Slade (2001). "Interpreting scores on the Kessler Psychological Distress Scale (K10)." *Australian and New Zealand Journal of Public Health* 25: 494–7.

Department of Health and Ageing (1999). "National physical activity guidelines for adults." DoHA, Canberra.

Kessler, R.C., G. Andrews, L.J. Colpe, E. Hiripi, D.K. Mroczek, S. T. Normand, E.E. Walters and A.M. Zaslavsky (2002). "Short screening scales to monitor population prevalences and trends in non-specific psychological distress." *Psychological Medicine* **32**: 959–76.

National Health and Medical Research Council (2001). "Australian alcohol guidelines: health risks and benefits." NHMRC, Canberra.

National Health and Medical Research Council (2003a). "Dietary guidelines for Australian adults." NHMRC, Canberra.

National Health and Medical Research Council (2003b). "Dietary guidelines for children and adolescents in Australia." NHMRC, Canberra.

National Health and Medical Research Council (2009). "Australian guidelines to reduce health risks from drinking alcohol." NHMRC, Canberra.

World Health Organization (2000). "Obesity: preventing and managing the global epidemic: report of a WHO consultation." *WHO technical report series* 894, WHO, Geneva, Switzerland.