

Housing and health for Aboriginal people in urban NSW, Australia

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Housing and health for Aboriginal people in urban New South Wales, Australia

Melanie Andersen

A thesis in fulfilment of the requirements for the degree of
Doctor of Philosophy

School of Public Health and Community Medicine

Faculty of Medicine

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April 2018

Thesis/Dissertation Sheet

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Abstract 350 words maximum: (PLEASE TYPE)
<p>Housing is a known determinant of health for Aboriginal Australians in remote communities. However, less is known about the impact of housing on health for Aboriginal people who live in urban areas. This thesis provides, for the first time, a systematic examination of the housing of urban Aboriginal people as it relates to health and wellbeing. It examines Aboriginal people's beliefs about their housing and presents a granular description of the housing conditions of a significant sample of Aboriginal people in identified urban communities participating in phase one of the Study of Environment on Aboriginal Resilience and Child Health (SEARCH), the largest cohort study of urban Aboriginal child health in Australia.</p> <p>Chapter Two explores the views of Aboriginal people living in Western Sydney about their housing circumstances. Difficulty accessing housing, secondary homelessness, crowding and poor dwelling conditions were described as common. Participants associated housing problems with physical and mental health problems.</p> <p>Chapter Three examines Aboriginal perspectives about the causes of urban Aboriginal housing disadvantage. Racial discrimination, poverty, marginalisation and a shortage of social and affordable housing were described as key barriers for many Aboriginal people attempting to access housing in Sydney.</p> <p>Chapter Four describes the housing of the SEARCH cohort and examines differences in exposure to specific housing problems by tenure type. Housing problems were prevalent. While SEARCH families in social housing had significantly better housing stability and affordability than those in private rental, they reported significantly more physical dwelling problems than those in both privately rented and owned homes.</p> <p>In Chapter Five, poor housing conditions were found to be independently associated with recurrent gastrointestinal infection in SEARCH children in a dose-dependent manner.</p> <p>This thesis establishes housing as an issue of major concern for Aboriginal people in urban New South Wales in relation to health and wellbeing. It offers some initial evidence of an association between exposure to housing problems and gastrointestinal infection in urban Aboriginal children. This work provides a platform to better understand housing and health in urban Aboriginal communities and to design, develop and test interventions that aim to improve them.</p>

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Signed

Dr Anna Williamson

22 September 2017

Contribution Statement

The Study of Environment on Aboriginal Resilience and Child Health (SEARCH) was conceived of by the study Chief Investigators. Housing was identified as an issue of concern in regard to health by the Aboriginal community leaders consulted during the establishment of SEARCH and thus was included as a central variable in baseline questionnaires by Professor Sally Redman and Dr Anna Williamson. All contributions made by others to work included in this thesis, including those of co-authors, have been explicitly acknowledged in the relevant subsequent chapters. While I was not involved in the establishment of the SEARCH questionnaire, I designed and conducted the focus groups reported on in this thesis, conceived of all of the research questions explored in this thesis and led all work included herein.

Signed

Melanie Andersen

20 February 2018

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Abstract

Housing is a known determinant of health for Aboriginal Australians in remote communities. However, less is known about the impact of housing on health for Aboriginal people who live in urban areas. This thesis provides, for the first time, a systematic examination of the housing of urban Aboriginal people as it relates to health and wellbeing. It examines Aboriginal people's beliefs about their housing and presents a granular description of the housing conditions of a significant sample of Aboriginal people in identified urban communities participating in phase one of the Study of Environment on Aboriginal Resilience and Child Health (SEARCH), the largest cohort study of urban Aboriginal child health in Australia.

Chapter 2 explores the views of Aboriginal people living in Western Sydney about their housing circumstances. Difficulty accessing housing, secondary homelessness, crowding and poor dwelling conditions were described as common. Participants associated housing problems with physical and mental health problems.

Chapter 3 examines Aboriginal perspectives about the causes of urban Aboriginal housing disadvantage. Racial discrimination, poverty, marginalisation and a shortage of social and affordable housing were described as key barriers for many Aboriginal people attempting to access housing in Sydney.

Chapter 4 describes the housing of the SEARCH cohort and examines differences in exposure to specific housing problems by tenure type. Housing problems were prevalent. While SEARCH families in social housing had significantly better housing stability and affordability than those in private rental, they reported significantly more physical dwelling problems than those in both privately rented and owned homes.

In **Chapter 5**, poor housing conditions were found to be independently associated with recurrent gastrointestinal infection in SEARCH children in a dose-dependent manner. This thesis establishes housing as an issue of major concern for Aboriginal people in urban New South Wales in relation to health and wellbeing. It offers some initial evidence of an association between exposure to housing problems and gastrointestinal infection in urban Aboriginal children. This work provides a platform to better understand housing and health in urban Aboriginal communities and to design, develop and test interventions that aim to improve them.

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Many thanks to the Aboriginal children and their carers who gave their time to participate in SEARCH, the Aboriginal Community Controlled Health Services for their ongoing commitment to the study, the Aboriginal Research Officers who collected the data and the SEARCH Investigators who had the foresight and wherewithal to start SEARCH. It has been a pleasure to work with the SEARCH team – Deanna, Simone, Adam, Leonie, Janice, Elena, Christian, Hilary, Shingi and Nicole. Special thanks go to Dr Sumithra Muthayya, for her calm head steering the ship, and to Peter Fernando for his ongoing support for and contribution to the housing studies.

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Away from the office, thanks go to my friends – Anna, Gemma, Sarah, Emma and Liz – and to my parents and sisters for their love and help with childcare. Thanks to my children for being such pleasurable diversions: Miles for his hugs and vivacious energy; Sofie for our vocal duets and philosophical discussions; and to you both for our rocky road-making sessions. Last, but far from least, I extend deep gratitude to my husband, Knut, for his love and understanding throughout my candidature. Thank you, Knut, for treating my PhD as a family project. I owe you countless hours of housework and childcare; thank you for having the grace not to cash these credits in all at once.

Dedication

This thesis is dedicated with love to my parents, Cathie and Mark Pitkin, my husband, Knut Andersen, and our children, Sofie and Miles.

Mum didn't live to see me submit this thesis, but if not for her, I may never have begun.
And if not for the rest of you, I may never have finished!

List of Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ACCHO	Aboriginal Community Controlled Health Organisation
ACCHS	Aboriginal Community Controlled Health Service
ADC	Aboriginal Development Commission (now defunct)
AH&MRC	Aboriginal Health and Medical Research Council of New South Wales
AHO	Aboriginal Housing Office
AMS	Aboriginal Medical Service
AMSW	Aboriginal Medical Services Western Sydney
ATSIC	Aboriginal and Torres Strait Islander Commission (now defunct)
CHP	Community Housing Providers
CNOS	Canadian National Occupancy Standard
FACS	Family and Community Services
GSS	General Social Survey
ICHO	Indigenous Community Housing Organisation
LSAC	Longitudinal Study of Australian Children
LSIC	Longitudinal Study of Indigenous Children
NATSISS	National Aboriginal and Torres Strait Islander Social Survey
NGO	Non-Government Organisation
NSW	New South Wales
PEDS	Parents' Evaluation of Development Status
SDQ	Strengths and Difficulties Questionnaire
SEARCH	Study of Environment on Aboriginal Resilience and Child Health
SIH	Survey of Income and Housing
US/USA	United States/United States of America
WA	Western Australia
WAACHS	Western Australia Aboriginal Child Health Survey
WA	Western Australia
WHO	World Health Organisation

Publications

Publications arising from work presented in this thesis

Andersen M, Williamson A, Fernando P, Redman S, Vincent F. (2016) ‘There’s a housing crisis going on in Sydney for Aboriginal people’: focus group accounts of housing and perceived associations with health.’ *BMC Public Health*, 16:429
10.1186/s12889-016-3049-2 (Study One, **Chapter 2**)

Andersen M, Williamson A, Fernando P, Redman S, Wright D, Eades S. (2017) ‘They took the land, now we’re fighting for a house’: Aboriginal Perspectives about Urban Housing Disadvantage.’ *Housing Studies* [online first]. DOI
10.1080/02673037.2017.1374357 (Study Two, **Chapter 3**)

Andersen M, Williamson A, Wright D, Fernando P, Redman S (2017). ‘Housing conditions of urban households with Aboriginal children in NSW Australia: tenure type matters.’ *BMC Public Health* 18(70). DOI 10.1186/s12889-017-4607-y
(Study Three, **Chapter 4**)

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Additional publications during PhD candidature

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Conference Presentations

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Andersen M, Williamson A, Skinner A, Wright D, Fernando P, Redman S. 'Urban Aboriginal housing: what's the problem and where to next?', presented at the 2017 Study of Environment on Aboriginal Resilience and Child Health Annual Forum, Sydney, August 2017.

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Andersen M, Williamson A, Wright D, Fernando P, Redman S 'Urban Aboriginal Housing Conditions: Tenure Type Matters', presented at the Australasian Housing Researchers Conference, Auckland, February 2016.

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Andersen M. 'Housing and health for Aboriginal people living in urban NSW', presented at the Australian Housing and Urban Research Institute Postgraduate Student Symposium, Hobart, February 2015.

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Andersen M. 'Housing and health for Aboriginal families living in urban areas', presented at the School of Public Health and Community Medicine Annual Student Conference, UNSW Sydney October 2010.

Andersen M. 'Housing and health research at the Sax Institute'. Invited presentation at AHURI Symposium: 'The health impacts of housing – an investigative panel of Australian and New Zealand researchers, public health and housing officials', Sydney, July, 2010.

Andersen M, Fernando P. 'SEARCH: The Study of Environment on Aboriginal Resilience and Child Health', presented at Building Mental Wealth: Improving mental health for better health outcomes among Indigenous Australians, Sydney, July, 2010.

Williamson A, **Andersen M**, Redman S, Dadds M, D'Este C, Daniels J, Eades S, Raphael B. 'Measuring the mental health of Indigenous children: a review of the literature from 1998-2008', presented at the Public Health Association of Australia 39th Annual Conference, Canberra, September 2009.

CHAPTER 1: INTRODUCTION

1.1 Housing and health

Housing is a basic human need and adequate housing is a universal human right (Australian Human Rights Commission, 2008, United Nations General Assembly, 1948). Housing forms a central backdrop to our lives and is closely associated with notions of 'home', a place in which we perform our daily rituals and that holds 'considerable social, psychological and emotive meaning for individuals and groups' (Easthope, 2004, p. 135). Housing is also an economic commodity, a high cost item for most households and an important material resource through which wealth can be accumulated and expressed (Baker, Beer et al., 2017). Our housing is intimately enmeshed with many aspects of our lives, including our interactions with family and friends and our ability to engage in activities related to our health, wellbeing, education and employment.

Adequate housing provides more than just shelter; it also provides security of tenure (the legal right to occupy housing), affordability, accessibility, amenity and is culturally appropriate (Australian Human Rights Commission, 2008, Baker, Beer et al., 2017, Howden-Chapman, 2004). Other housing factors relevant to the study of housing in relation to health include the functional status of utilities, crowding, injury hazards, temperature control, indoor air pollution, noxious substances, noise, dwelling height, cultural appropriateness, location and overlapping neighbourhood factors, along with homelessness, perhaps the most extreme form of housing disadvantage (Bonnefoy, 2007, Howden-Chapman, 2004, Jacobs, 2011, Thomson, Petticrew et al., 2001).

Systematic study of the links between housing and health began in 19th century London, when connections were made by sanitarians like Edwin Chadwick between the crowded, substandard conditions of tenements and the very high rates of infectious disease experienced by residing tenants (Howden-Chapman, 2004, Phibbs and Thompson, 2011). Theories that dirt or 'bad air' from squalid living conditions caused sickness were, in some sense, early precursors to modern germ theory (Howden-Chapman, 2004). During this time, revolutionary work was conducted by John Snow, who curbed a cholera outbreak by mapping the precise location of cases and speaking to local residents to deduce the common source of disease exposure, a contaminated water pump, which he then persuaded the council to disable (Snow, 1855). This

impressive public health intervention, achieved through modification of the built environment, was possible even without the benefit of current knowledge about disease transmission through microorganisms (Baker, Beer et al., 2017, Howden-Chapman, 2004). Modern understanding of the ways in which environments can affect human health include bioecological theories, which posit that human health and development are shaped by physical, social, neighbourhood and broader political contexts (Bronfenbrenner and Morris, 2006).

There is now a substantial body of international epidemiological evidence that demonstrates strong independent associations between housing and both physical and mental health (Baker, Beer et al., 2017, Dunn, 2000, Evans, 2006, Thomson, Thomas et al., 2013). Poor housing can affect health directly, for instance, through exposure to toxic substances, and indirectly, for example by causing stress that in turn exacerbates illness (Riva, Plusquellec et al., 2014, Saegert, Klitzman et al., 2003, Shonkoff, Garner et al., 2012). Relationships have been identified between inadequate housing and infectious disease, injury, poor nutrition, chronic illness and mental ill health; both short term and long term health effects have been documented (Bonnefoy, 2007, WHO, 2006). Damp and mouldy housing, for example, is independently associated with asthma, other chronic respiratory conditions, depression, anxiety and recurrent headaches (Butler, Williams et al., 2003, Krieger and Higgins, 2002, Shorter, Crane et al., 2017). Some effects of poor housing, including exposure to toxins, are irreversible (Bellinger, Leviton et al., 1987, Dockery, Kendall et al., 2010, Needleman, Schell et al., 1990, White, Diamond et al., 1993). Crowding is associated with infectious disease and psychological distress, hazards with injury, and frequent residential moves with poor social and emotional wellbeing (Baker, Das et al., 2008, Baker, McDonald et al., 2013, Baker, McNicholas et al., 2000, Keall, Baker et al., 2008, Mok, Webb et al., 2016, Taylor and Edwards, 2012, Williamson, D'Este et al., 2016). Housing affordability problems are associated with poor mental health, particularly for renters and low income households (Bentley, Pevalin et al., 2015, Mason, Baker et al., 2013). Indeed, there are many complex pathways through which housing can affect health and wellbeing. Multiple forms of housing problems can also coexist and have a cumulative impact on health over time

(Baker, Beer et al., 2017, Baker and Lester, 2016, Howden-Chapman, 2004, Marsh, Gordon et al., 2000).

There are particularly strong demonstrated associations between housing problems and adverse health outcomes in children (Bailie, Stevens et al., 2010, Baker, McNicholas et al., 2000, Cutts, Meyers et al., 2011, Dockery, 2013, Jacoby, Carville et al., 2011, Shorter, Crane et al., 2017). Children are especially vulnerable to adverse housing conditions as they are still developing physically and socially; younger children tend to spend a large proportion of their time at home and are more prone than adults to injury and various communicable diseases (Evans, 2006, Keall, Baker et al., 2008). Poor housing in childhood has been shown to predict poorer health in adulthood, even after controlling for the effects of socioeconomic deprivation (Dedman, Gunnell et al., 2001, Dockery, Kendall et al., 2010, Evans, 2006, Mok, Webb et al., 2016). Findings from a large longitudinal study in the United Kingdom revealed that,

'even when other relevant factors are allowed for, [study] data suggest that experience of both current and past poor housing is significantly associated with greater likelihood of ill health. Moreover, for those who are living in non-deprived housing conditions in adulthood, ill health is more likely among those who experienced housing deprivation in earlier life than among those who did not. Thus, history matters' (Marsh, Gordon et al., 2000, p. 411).

There is also some evidence to suggest that the housing facilities available may affect carers' ability to provide care for their children. One American study with low-income inner-city households found a significant relationship between family exposure to poor housing conditions and inadequate child care in terms of child nutrition, clothing and personal hygiene, after adjustment for other predictors of neglect (Swanson-Ernst, Meyer et al., 2004). Beyond physical conditions, housing issues such as housing affordability, tenure type, crowding, frequent residential moves and homelessness have also been associated with a range of negative health, emotional, social and developmental outcomes in children (Dockery, Kendall et al., 2010, Evans, 2003, Evans, Lepore et al., 1998, Whittaker, 2017, Williamson, D'Este et al., 2016).

Caution is required in making inferences about the causal role of housing environments on health based on cross-sectional studies. While most epidemiological studies control for socioeconomic factors and other potential confounders, residual confounding can occur (Dockery, 2013). Temporal issues also pose potential difficulties, including time lag effects and the fact that both current and previous housing exposures may be associated with ill health (Dockery, 2013, Keall, Baker et al., 2008, Marsh, Gordon et al., 2000). These issues are important because the associations between housing and health are known to be bi-directional (Baker, Mason et al., 2014). Self-selecting processes can also occur, whereby those who are unwell may be more likely to live in precarious, poor quality or social housing, due, for instance, to their decreased capacity to earn a high income (Hinds, Bechtel et al., 2016, Ruel, Oakley et al., 2010). For example, in one study, the birth of a child with a severe health condition (considered to be random) increased the likelihood of families experiencing crowding, homelessness and potentially also poor housing quality three years later (Curtis, Corman et al., 2010). This study, and others (Bentley, Baker et al., 2011, Pierse, Carter et al., 2016) point to the value of longitudinal over cross-sectional study design in tracking the direction of associations (Curtis, Corman et al., 2010).

The strength of the evidence demonstrating a relationship between housing and health is greatly enhanced by the fact that housing interventions generally have a positive effect on health outcomes. A recent Cochrane review found 39 studies that assessed changes in health after systematic improvement of the physical fabric of housing, conducted internationally from 1887 – 2012 (Thomson, Thomas et al., 2013). Most studies found that housing improvements lead to statistically significant gains in the physical or mental health of occupants (Howden-Chapman, Crane et al., 2011, Howden-Chapman, Matheson et al., 2007, Howden-Chapman, Pierse et al., 2008, Thomson, Thomas et al., 2009, 2013). Interventions focused on warmth improvement and energy efficiency, for example (such as retrofitting insulation and installation of affordable, safe, fuel-efficient heating), resulted in improved health or reduced absences from work and school due to illness, particularly in those with existing respiratory symptoms (Howden-Chapman, Matheson et al., 2007, Howden-Chapman, Pierse et al., 2008, Thomson, Thomas et al., 2009, 2013). The review authors concluded that 'it would

appear that improvements to housing conditions can lead to improvements in health. Improved health is most likely when the housing improvements are targeted at those with poor health and inadequate housing conditions, in particular inadequate warmth' (Thomson, Thomas et al., 2013, p. 3).

Many argue that poor housing is an under-appreciated determinant of poor health in wealthy nations (Baker, Lester et al., 2016, Howden-Chapman, 2012). Time use studies indicate that people in developed nations spend more time in their indoor housing environment (roughly 70%) than in any other environment, meaning that problematic housing environments can have a large health impact due to long duration of exposures (Baker, Keall et al., 2007, Brasche and Bischof, 2005). However, the predominant belief that housing conditions are adequate in countries like Australia - which Baker et al. refer to as the 'good housing paradigm' - may mean that those with poor housing do not have these problems acknowledged or addressed and may also mean that potential health savings are being missed (Baker, Lester et al., 2016).

For instance, in New Zealand, unintentional home injuries cost approximately 3.5 times that of road injuries (Keall, Guria et al., 2011). Studies have shown that home injuries are associated with housing hazards, that housing improvements programs are effective at reducing injuries such as falls, and that such housing interventions are highly cost-effective (Keall, Pierse et al., 2015, Keall, Pierse et al., 2017, Keall, Baker et al., 2008). Yet while most countries mandate regular health and safety inspections of vehicles and workplaces, few impose similarly explicit ongoing health and safety checks for housing environments, aside from planning and building regulations during construction (Bennett, Howden-Chapman et al., 2016, Krieger and Higgins, 2002). In NSW, landlord obligations under the current Residential Tenancies Act regarding property conditions are relatively vague, requiring only that properties 'be in a reasonable state of cleanliness, be fit for habitation and be maintained for the life of the tenancy in a reasonable state of repair' (NSW Fair Trading, 2015, p. 24), in addition to complying with general legal requirements like the installation of smoke alarms and pool fencing. Tasmania recently passed legislation specifically requiring rental homes to have basic facilities such as heating, ventilation, cooking facilities and running water and tenant

advocacy groups are calling for similar moves in NSW (NSW Fair Trading, 2015). In New Zealand, high quality evidence about the health impacts of poor housing has been effectively used to argue that rental properties should meet more rigorous minimum health and safety standards; trials of the implementation of such standards are underway (Bennett, Howden-Chapman et al., 2016).

Until very recently there has been a distinct lack of Australian research about links between housing and health (Dockery, 2010, 2013, Phibbs and Thompson, 2011). This is potentially important because environmental, social, cultural, and housing conditions and contexts differ considerably between Australia and Europe, America and even nearby New Zealand.

1.2 The Australian housing context

Australia is a relatively wealthy nation, where most residents enjoy good quality housing by international standards (ABS, 2000a, Baker, Lester et al., 2016). The majority of Australian's ten million dwellings are free-standing houses (73%) rather than townhouses (13%) or apartments (13%), although the proportion of separate houses is slowly declining (ABS, 2017b). As will be discussed in **Chapter 4**, home ownership has historically been the dominant tenure type due to the security and control it offers, and it remains an important form of net wealth for many Australians. Home ownership also carries significant tax and social benefits in Australia. The Australian aged pension is structured under the assumption that retirees will own their home; those who do not are at significantly higher risk of poverty and housing affordability stress in old age (Hulse, Burke et al., 2012, Hulse and Lise, 2008, Kemp, Paleologos et al., 2014). Renting has traditionally been considered a transitional tenure type in Australia, or one for low income households who cannot afford home ownership (Bentley, Pevalin et al., 2015).

However, Australian housing prices have risen sharply in recent years such that Australian housing is now amongst the most unaffordable in the world (Demographia, 2017). Sydney, Australia's largest city and the capital city of NSW, currently has the worst housing affordability of any city ever rated outside of Hong Kong (Demographia, 2017). Correspondingly, home ownership trends are starting to shift; the proportion of

Australian households who own their homes outright has fallen significantly in recent years, while the proportion renting or paying a mortgage has risen (ABS, 2017b). Some have labelled this shift 'the death of the great Australian dream' (ABS, 2000b, Safi, 2016). Even so, in 2016, 31% of Australians owned their homes outright, 35% of Australians owned their home with a mortgage and 31% were renting in some capacity (ABS, 2017b). Only 4% of the Australian population live in some form of social housing (AIHW, 2014c). Social housing is subsidised housing provided by governments and community organisations to those who have difficulty accessing housing in the private market, allocated according to needs-based criteria (Howden-Chapman, 2004). While 0.5% of Australians are classified as homeless in point in time estimates, an estimated 13% of Australian adults have had at least one episode of homelessness in their lives (ABS, 2011a, Whittaker, 2017).

The average number of people per household in Australia is 2.6 (ABS, 2017b). An estimated 3.2% of non-Aboriginal Australian households are considered crowded according to Canadian National Occupancy Standard (Biddle, 2012b). The proportion of multiple family households has increased in the five years since Australia's last Census of Population and Housing, which may be in part a response to current affordability pressures, and may also reflect an increase in the number of Australian residents born in countries such as China and India, for whom multi-generational living is traditional practice (ABS, 2017b, Liu and Easthope, 2012).

There is a shortage of affordable rental properties in the private housing markets of NSW and other Australian states (National Shelter, CHOICE et al., 2017, NSW Audit Office, 2012, Rowley, Leishman et al., 2017). A recent audit of available rental properties in the Sydney region found that almost none were affordable for low income households (Kemp, Paleologos et al., 2014). Australia's competitive private rental markets, combined with relatively weak protections for tenants, are contributing to poor quality, insecure and unaffordable housing for the increasing number of Australians who rent (Hulse and Lise, 2008, National Shelter, CHOICE et al., 2017). Moreover, there is evidence of racial discrimination in Sydney's private rental market, creating additional barriers for minority groups (Macdonald, Nelson et al., 2016).

Housing assistance is provided to low income households in Australia in three main ways: social housing, which is largely state-owned and managed; Commonwealth Rent Assistance (CRA), a rental subsidy for those renting in the private market or from a community housing provider; and through housing purchase assistance schemes. There is an acknowledged, critical shortage of social housing in Australia, with long waiting lists in most parts of NSW (NSW Audit Office, 2012, NSW Government). Social housing is generally only available to householders on government benefits or low incomes, an increasing proportion of whom are considered 'vulnerable clients for whom the private market presents 'extreme challenges' (NSW Audit Office, 2012). Recent years have seen a relative contraction of the social housing sector and concern has been expressed by academics and government agencies about the future sustainability of much-needed social housing services (Jacobs K, Atkinson R et al., 2010, NSW Audit Office, 2012). The NSW social housing sector is currently undergoing a suite of significant changes as part of a new social housing strategy known as 'Future Directions' (NSW Government, 2016). These will be discussed in relation to the findings in this thesis in **Chapter 6**.

While the vast majority of housing and health research has been conducted outside of Australia (Phibbs and Thompson, 2011), a recent body of work has examined housing and health in the Australian population (Baker, Beer et al., 2017, Baker and Lester, 2016, Baker, Lester et al., 2016, Bentley, Baker et al., 2012, Bentley, Baker et al., 2011, Bentley, Pevalin et al., 2015, Mallett, Bentley et al., 2011, Mason, Baker et al., 2013). This research about the housing of the general population in Australia has largely relied on self-report survey data. A core component of this recent Australian research has focused on the relationship between housing affordability and mental health. An estimated 27% of Australians were experiencing housing affordability stress at the 2011 Census¹, as defined by the 30:40 rule (where those in the lowest 40% of the income distribution who spend more than 30% of their gross income on housing are considered to experience housing affordability stress) (Biddle, 2012b). The mental health effects of housing affordability stress are significant for low income households; these effects are exacerbated by moving house and are mediated by tenure type and the level of

¹ Latest available national data.

government protection available to tenants in unaffordable housing (Bentley, Baker et al., 2011, Bentley, Pevalin et al., 2015, Mason, Baker et al., 2013).

Little data are gathered about housing conditions in Australia. This is consistent with the notion of the 'good housing paradigm', which has arguably been predominant in Australia until very recently; when housing conditions are not considered problematic, they are given limited attention (Baker, Lester et al., 2016). Most of the dwelling condition data available are based on cross-sectional, self-report surveys, which, while useful, may be less accurate than assessment by a trained building inspector or environmental health professional. As will be discussed in **Chapter 4**, there is some evidence to suggest that residents tend to underreport problems with their housing (Byles, Mackenzie et al., 2014) and that new home owners tend to optimistically underestimate the cost of repairs and maintenance required (Smith, 1996).

Nevertheless, self-reported data provide useful information and remains the most practicable way to gather housing quality data from large numbers of people.

The last national survey of housing conditions, the Australian Housing Survey (AHS), was conducted in 1999. The physical dwelling conditions reported by residents of over 7 million Australian households were good overall; 80% of Australian homes were reported to have no major structural problems (ABS, 2000a). Since the AHS, the Survey of Income and Housing (SIH) has gathered self-report housing data from a smaller, representative sample of households every two years. In the most recent 2013-14 survey, 85% of 14,162 participating households reported that their home had no major structural problems (ABS, 2015). However, differences were observed by tenure type; the raw proportion of households renting from a state or territory housing authority reporting no major structural problems was 67%, compared to 88% of households in owned homes (ABS, 2015). The National Social Housing Survey, a regular survey of social housing residents' self-reported satisfaction with their housing, likewise indicates poorer dwelling conditions for those in social housing than for Survey of Income and Housing participants, and that variation in dwelling quality and client satisfaction also exists between social housing providers (AIHW, 2013b).

Another source of data about Australian dwelling conditions is the annual Household Income and Labour Dynamics in Australia (HILDA) survey, a nationally representative cohort study of 17,000 Australians that began in 2001 (Wilkins, 2017). In six waves of HILDA, external dwelling conditions were subjectively ranked by survey collectors with no housing expertise, on a single, five-point scale, from very good-excellent to very poor-derelict (Baker, Lester et al., 2016). While the authors of a longitudinal study of the relationships between housing and health using HILDA data acknowledge the limitations of this single, subjective measure of dwelling quality by an unskilled assessor, HILDA is the only large, representative longitudinal dataset in Australia that includes any measure about housing condition (Baker, Lester et al., 2016). Seventy percent of HILDA dwellings were rated as being in good-excellent condition, 25% in average condition and 5% in poor-derelict conditions in across-wave average analyses (Baker, Lester et al., 2016). Householders in poor-derelict homes were more likely to have lower incomes, to be younger, to be Aboriginal and to be renting, particularly from a social housing provider (Baker, Lester et al., 2016). The proportion of social housing tenants living in homes judged to be in poor-derelict condition was 19%, compared to 9% of those renting privately and 3% of those in owned homes (Baker, Lester et al., 2016). In models adjusted for socio-economic status, those living in poor-derelict housing had significantly poorer self-reported mental, physical and general health (as measured by the SF-36) than those in excellent-very good housing (Baker, Lester et al., 2016).

In a smaller, self-report, cross-sectional study of 1008 low-income South Australians in 2013, housing disadvantage was conceptualised in terms of cumulative 'bundles' of 'housing insults' that included problems with affordability, tenure stability, dwelling quality and physical conditions (Baker, Beer et al., 2017). Home owners again reported the best housing situations, with the lowest number of housing insults. However, in this study, those renting in the private market experienced a significantly higher number of housing insults than those in social housing (Baker, Beer et al., 2017). Most available data suggest that there are differences in a range of housing factors by tenure type. Thus **Chapter 4** examines differences in exposure to poor dwelling conditions and other housing problems by tenure type within the studied population.

Studies of housing and child health in Australia are scant (Dockery, Kendall et al., 2010). One child health study that gathers some housing data is the Longitudinal study of Australian children (LSAC) (Dockery, 2013, Maguire, Edwards et al., 2011). LSAC is following a representative sample of Australian children from metropolitan and regional areas over time to track the impact of social and cultural environments on child health and development. It began in 2004 with a total of 10,000 children aged under 5 years at wave 1; the study is ongoing and surveys the carers of participating children every two years (Maguire, Edwards et al., 2011). LSAC includes an approximate measure of housing quality similar to that used in HILDA; a single, subjective, interviewer-assessed measure of external dwelling quality, rated on a four-point scale (1 represents badly deteriorated, 2 is poor condition, 3 is fair condition and 4 is well-kept and in good repair). In 96% of observations, LSAC homes were judged to be in either good or fair condition (Dockery, 2013). LSAC also collects data about tenure type, dwelling type, mobility (number of moves since child's birth), subjectively reported housing affordability stress and crowding (Dept of FaHCSIA, 2009). Longitudinal studies of LSAC data found that poor dwelling conditions were independently associated with poor child social and emotional wellbeing but not poor physical health (Dockery, 2013). Housing affordability stress was associated with poor physical and social/emotional health outcomes amongst children, independent of general financial prosperity (Dockery, 2013). Crowding was associated with poorer learning outcomes, and frequent residential moves were associated with poor physical health and poor social and emotional wellbeing (Dockery, 2013). While these associations were independent and significant, study authors concluded that the effect of housing exposures on the health of Australian children in the LSAC cohort overall was modest, but that housing did seem to have a more substantial effect on health outcomes for particular groups within the cohort, including single parent families and Aboriginal children (Dockery, 2013).

1.3 Aboriginal Australians

Aboriginal and Torres Strait Islander Australians (hereafter Aboriginal²) are the indigenous peoples of Australia and have lived in Australia for over 50,000 years (AIHW, 2015, Clarkson, Jacobs et al., 2017, Tobler, Rohrlach et al., 2017). Estimates of the Aboriginal population at the time of European invasion range from 300,000 to 1 million people (NSW Department of Health, 2004). Aboriginal people lived right across Australia in hundreds of groups with distinct languages, cultural practices and attachment to lands (AIHW, 2015, Behrendt, 2012, Tobler, Rohrlach et al., 2017). As for many indigenous peoples, colonisation saw many traumas inflicted on Aboriginal Australians, including the introduction of disease, violence, forced removal from homelands, incarceration on missions, the forced removal of children by government and welfare organisations, labour exploitation and the denial of basic civil liberties (Holmes, Stewart et al., 2002, NSW Department of Health, 2004, Paradies, 2016). By the 1930s, the Aboriginal population was reduced to approximately 80,000 people (AIHW, 2015). The effects of colonisation are still being felt by Aboriginal people today through intergenerational trauma, cycles of poverty, poor living conditions and ongoing experiences of racial discrimination and marginalisation (AIHW, 2015, NSW Department of Health, 2004, Paradies, 2016).

Australia's population was estimated at 24.3 million people in December of 2016, of which 3.3% (an estimated 786,689 people) identified as Aboriginal or Torres Strait Islander (ABS, 2017d, Biddle and Markham, 2017). While Aboriginal Australians are not a homogenous group, a disproportionate number of Aboriginal people experience profound socioeconomic disadvantage. The substantial disparity between Aboriginal and non-Aboriginal Australians in almost all measures – health, housing, education, employment, income, community and family violence, and incarceration – is commonly referred to as 'the gap' (AIHW, 2015). In 2008, the Coalition of Australian Governments (COAG, the peak intergovernmental forum in Australia) committed to specific targets and programs designed to help close the gap. Progress has been made in some areas,

² The term 'Aboriginal' will be used throughout this thesis, as is common practice in NSW (NSW Health, 2004). The majority of Torres Strait Islander Australians live in Queensland and the Torres Strait Islands. Aboriginal people in NSW have expressed a strong preference for the term 'Aboriginal' in favour of the term 'Indigenous'.

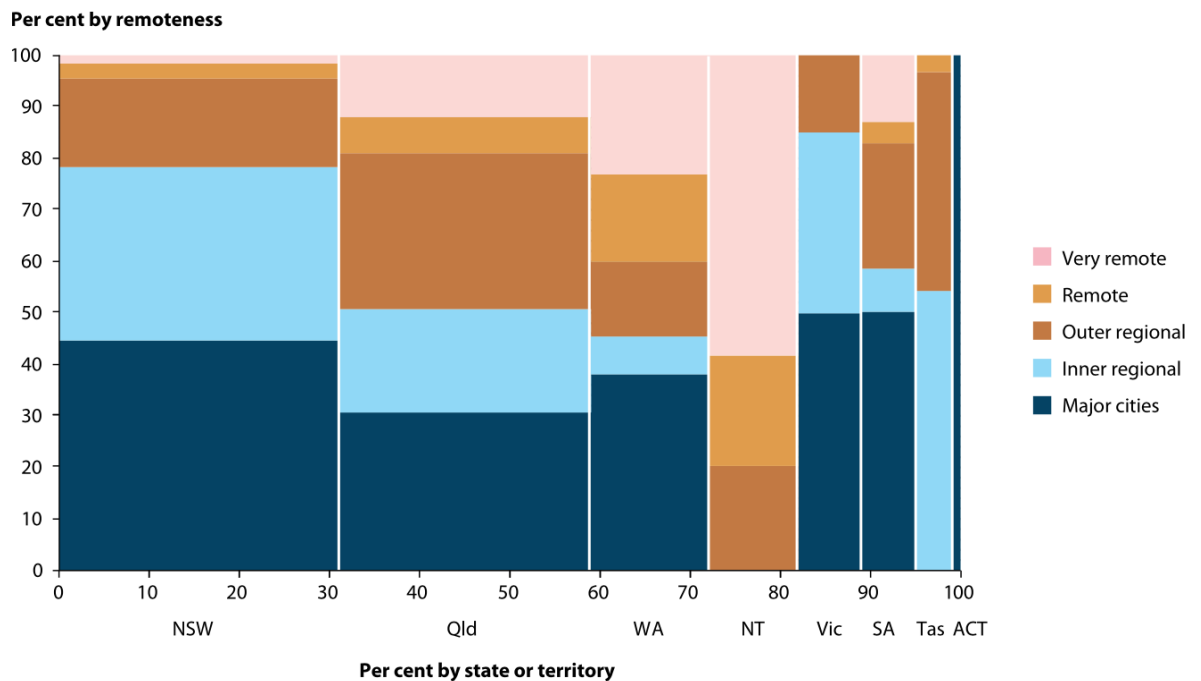
but many of the indicators of disparity between Aboriginal and non-Aboriginal Australians remain unchanged and in some areas the gap is widening (Commonwealth of Australia, 2017).

The Australian Bureau of Statistics divides Australian geographical locations into five regions of remoteness, based on their distance from urban centres, population and proximity to services: major cities, inner regional, outer regional, remote and very remote (AIHW, 2015). These categories are often converted into the binary categories, 'remote' and 'non-remote'. The term 'remote' refers to remote and very remote areas, and the remaining areas are collectively termed 'non-remote' (i.e. major cities, inner and outer regional) (ABS, 2013, AIHW, 2015). These are useful descriptive categories because there are substantial differences between the physical and social environments in remote and non-remote areas (Bailie and Wayte, 2006). Twenty one percent of Aboriginal Australians live in remote areas, compared to 2% of non-Aboriginal Australians. Approximately 79% of Aboriginal people live in non-remote areas (35% in major cities, 22% in inner regional areas 22% in outer regional areas) (AIHW, 2015). NSW is home to more Aboriginal Australians than any other state (33.3%) and Sydney is home to 32.4% of the NSW Aboriginal population (ABS, 2017a).

This thesis will focus on Aboriginal Australians who live in major cities and inner regional areas (large regional towns), which will be collectively referred to as 'urban'³ areas, as per Biddle (2009a). As described later in this chapter, the study sample is drawn from locations classified in these two remoteness categories. In NSW, the proportion of Aboriginal people living in urban areas is higher than in most other states; 78% of Aboriginal people in NSW live in urban areas, as shown in Figure 1.1 (AIHW, 2015).

³ For conciseness, Aboriginal people who live in urban areas will sometimes be referred to as 'urban Aboriginal' people throughout this thesis. This term is used only to describe place of usual residence and its use does not mean to imply that Aboriginal people who live in urban areas are in some way different to those who live in remote communities.

Figure 1.1: Distribution of the Aboriginal and Torres Strait Islander population, by jurisdiction and remoteness at the 2011 Census.



(Source: AIHW (2015, p.16))

1.4 Aboriginal health

Aboriginal definitions of health encompass,

'not just the physical well-being of an individual but refers to the social, emotional and cultural well-being of the whole Community in which each individual is able to achieve their full potential as a human being, thereby bringing about the total well-being of their Community' (AH&MRC Website, Swan, 1995).

However, most of the available health outcome data regarding Aboriginal people relate only to individual measures of health and wellbeing.

The difference in health status between Aboriginal and non-Aboriginal Australians is substantial (AIHW, 2015). Perhaps the most striking illustration of this is the discrepancy in life expectancy; an Aboriginal child born in Australia at the time of writing can expect to live, on average, ten fewer years than a non-Aboriginal Australian child (AIHW, 2015). Aboriginal people experience the health problems prevalent in low-income countries, such as infectious disease and injury, in addition to the chronic diseases associated with

western industrialised lifestyles, such as cardiovascular disease, cancer and diabetes (AIHW, 2015, Gracey and King, 2009). Aboriginal people are more likely than non-Aboriginal people to die from external causes (injury and poisoning), endocrine, metabolic and nutritional disorders (including diabetes), respiratory and digestive diseases (AIHW, 2015). Aboriginal people also experience disproportionately high rates of psychological distress (AIHW, 2015, McNamara, Banks et al., 2014); suicide accounts for 4.8% of Aboriginal deaths, compared with 1.6% of deaths among non-Aboriginal people (AIHW, 2015).

Infant deaths comprise 4.2% of the deaths of Aboriginal people, compared to 0.8% of the deaths of non-Aboriginal people (AIHW, 2015). Aboriginal children are significantly more likely to be hospitalised with a range of infectious diseases and injury than non-Aboriginal children (Falster, Banks et al., 2016, Möller, Falster et al., 2016). These high rates of childhood infectious disease impact on child growth and development, school attendance and family productivity (Chen, Ford et al., 2016, Mackerras, Reid et al., 2003, McDonald, Bailie et al., 2009, Silburn, McKenzie et al., 2014). Infectious disease in childhood is also of concern because it is associated with chronic disease in adulthood (Burgner, Cooper et al., 2015, Moorin, Heyworth et al., 2010).

1.4.1 Remote and non-remote Aboriginal health differences

Aboriginal people in remote communities experience higher rates of hospitalisation and higher rates of many illnesses than those in non-remote areas (Moore, Manoharan et al., 2013). However, because the majority of Aboriginal people live in non-remote areas, 60% of the health gap between Aboriginal and non-Aboriginal people is attributable to those living in non-remote areas (Vos, Barker et al., 2009). Substantial health inequalities exist between Aboriginal and non-Aboriginal people, regardless of geographical location (Falster, Banks et al., 2016, Scrimgeour, 2007). Aboriginal all-cause morbidity is similar in urban and remote settings and some health problems, such as asthma, psychological distress, substance use and obesity, are more common amongst Aboriginal people living in urban areas (AIHW, 2015, Bradshaw, Alfonso et al., 2009, Scrimgeour, 2007, Silburn, Blair et al., 2007).

1.5 Aboriginal housing

Housing is repeatedly cited as a key factor contributing to the health gap between Aboriginal and non-Aboriginal Australians (AIHW, 2014c, Australian Housing Ministers' Conference, 2001, Bailie, Stevens et al., 2005, Bailie and Wayte, 2006, Pholeros, Rainbow et al., 1993, Torzillo, Pholeros et al., 2008, White, Walsh et al., 2010). The Census and other national surveys (AIHW, 2014c) indicate that there are large differences between the housing situations of Aboriginal and non-Aboriginal Australians (AIHW, 2014c, Baker, Lester et al., 2016), as is generally the case for indigenous peoples in other wealthy nations (Anderson and Collins, 2014, Narine, 2015, Statistics New Zealand, 2016).

Aboriginal households are much less likely to own their own homes or be paying off a mortgage than non-Aboriginal households (40% vs 67% at the 2016 Census), despite a slow increase in Aboriginal home ownership rates in recent years and a decrease among the general population (ABS, 2017b, AIHW, 2014c, Biddle and Markham, 2017). Australian Aboriginal home-ownership rates have historically been lower than those of indigenous populations in comparable countries, although this is slowly changing as rates rise in Australia and fall elsewhere (Lawson and Milligan, 2008, Statistics New Zealand, 2016). Twenty nine percent of Aboriginal people in Australia rent their homes from a social housing provider, compared with just 4% of non-Aboriginal Australians (AIHW, 2014c).

We know from Census data that Aboriginal households are 3.7 times as likely to experience crowding as non-Aboriginal households (Biddle, 2012b). They are also more likely to have more than one family living together than non-Aboriginal households (5.1% vs 1.8%) and to have more usual residents than non-Aboriginal households (an average of 3.2 vs 2.6 people) (ABS, 2017a). Cultural responsibilities also mean Aboriginal people often host visiting family and friends, which can exacerbate crowding issues (Birdsall-Jones and Corunna, 2008, Memmott, Birdsall-Jones et al., 2012). Data from HILDA and the Census also show that Aboriginal people are substantially more likely to experience homelessness and poor dwelling conditions, and somewhat more

likely to report affordability problems, than non-Aboriginal people (Baker, Lester et al., 2016, Baker, Mason et al., 2014, Biddle, 2011b, 2012b).

1.6 Remote Aboriginal housing

The social, economic and environmental contexts in remote Aboriginal communities differ markedly from those in urban communities (Bailie, Stevens et al., 2012). Remote communities are, by definition, geographically isolated and this can pose challenges to the delivery of essential services and facilities, including access to electricity, clean water, sewerage and waste removal, and home maintenance services (Clifford, Pearson et al., 2015). Other issues specific to remote communities, such as dust control, can also pose health risks for residents (Clifford, Pearson et al., 2015, Torzillo, Rainow et al., 1993). Most remote communities have a much higher proportion of Aboriginal residents than in more urban areas (AIHW, 2015, Zubrick, Lawrence et al., 2004). Private housing markets are small or absent in many remote Aboriginal communities and employment opportunities are often scarce, thus home ownership rates are low (18%) (AIHW, 2015, Memmott, Moran et al., 2009). Most Aboriginal households in remote areas rent from a social housing provider (57%) (AIHW, 2014c). Until recently, social housing in remote communities has chiefly been provided through local Indigenous Community Housing Organisations (ICHOs); however, recent policy changes have seen the transfer of social housing management to state and territory housing departments and non-Aboriginal Community Housing Providers (Habibis, Phillips et al., 2015).

Several studies have assessed, in detail, the housing conditions of Aboriginal people living in remote communities in the Northern Territory (Bailie, Stevens et al., 2010, Bailie and Runcie, 2001, Bailie and Wayte, 2006) and other remote and rural communities around Australia (Torzillo, Rainow et al., 1993, Torzillo, Pholeros et al., 2008). Many of these studies involved standardised assessment of housing conditions by trained surveyors (Bailie, McDonald et al., 2011, Bailie, Stevens et al., 2012, Bailie, Stevens et al., 2010, Pholeros, Rainbow et al., 1993, Torzillo, Pholeros et al., 2008), while some used self-report housing data (AIHW, 2014c, Biddle, 2011b, Melody, Bennett et al., 2016). Major housing problems have consistently been found to be prevalent in remote communities, with high rates of crowding, homelessness and large proportions of

homes without basic facilities considered necessary to sustain health (Torzillo, Pholeros et al., 2008). For example a direct-observation study of six communities in north west South Australia found that only 45% of hot water outlets were working, as were 60% of cold water outlets and 43% of waste disposal systems (drainage and sewerage) (Torzillo, Rainow et al., 1993). Moreover, 50% of people in these communities did not have housing but used the facilities of others in their community; thus, the hardware in the houses assessed was servicing many more people than would normally reside in each house (Torzillo, Rainow et al., 1993). Similar findings are echoed throughout direct-observation studies in other remote communities (Bailie, McDonald et al., 2011, Bailie, Stevens et al., 2012, Bailie, Stevens et al., 2010, Bailie, Stevens et al., 2005, Torzillo, Pholeros et al., 2008).

Other sources of data about remote Aboriginal housing conditions come from self-report surveys including the National Aboriginal and Torres Strait Islander Social Survey (NATSISS), and child health studies such as the Western Australian Aboriginal Child Health Survey (WAACHS) and the Longitudinal Study of Indigenous Children (LSIC). These studies include remote and non-remote participants; where comparative data are available, these studies generally note higher levels of crowding and most physical dwelling problems for participants from remote areas (AIHW, 2017). These self-report studies also report substantially lower levels of housing problems than direct-observation studies.

The WAACHS was a cross-sectional survey of the health of 5289 Aboriginal children from 1,999 Aboriginal families in Western Australia, conducted in 2001-02 (Zubrick, Lawrence et al., 2004). The sample was representative of Western Australian Aboriginal children. WAACHS developed their own measures of isolation not comparable with the ABS remoteness areas described above. According to this measure 31% of WAACHS children were from areas with no isolation (approximately 1600 children), 32% were from areas with low isolation (just under 1700 children) and 37% were from areas of moderate to extreme isolation (just under 2000 children) (Zubrick, Lawrence et al., 2004). WAACHS gathered self-report data about a range of housing factors, including crowding, mobility, affordability and detailed data about dwelling conditions, based on

the ability to perform healthy living practices (Silburn, Zubrick et al., 2006). While dwelling conditions were poorer for those in isolated areas, most WAACHS households from areas of extreme isolation reported having a working bath or shower to wash children and adults (97%) and 94% had access to hot water. Ninety two percent of those in extremely isolated communities reported having somewhere to cook a meal and 82% reported having cold food storage facilities. Instead the main housing problems reported by remote WAACHS households were crowding (43%), a lack of facilities to heat and cool homes, fly screens to keep vermin out and vegetation for dust control (Silburn, Zubrick et al., 2006, Zubrick, Lawrence et al., 2004).

The LSIC is an ongoing national Aboriginal child health cohort study that began in 2008 with 1671 children under the age of 5 years, children from remote communities were deliberately over-sampled (35%, or 593 children at baseline) (Thurber, Banks et al., 2015). Early waves of LSIC gathered only high level information about housing conditions (i.e. carer response to: 'in the last year have you felt too crowded where you live, moved house or had housing problems' (y/n); 'home needs major repairs' (y/n); and 'overcrowding' (more than two persons per bedroom) (Brandrup, 2013) but more detailed data were collected in later waves, including questions about the function of basic amenities (flushing toilet, bath or shower, laundry tub, washing machine, fridge, kitchen sink, working cooking facilities). LSIC households in isolated areas were most likely to be missing one or more basic amenity; 27% in areas of moderate isolation and 33% per cent in areas of high or extreme isolation (Department of Social Services, 2015).

The NATSISS is a representative survey of Aboriginal households conducted every six years that includes detailed self-report questions about housing (ABS, 2016). The last survey was in 2014-15 with 11,178 Aboriginal households, 21% of whom were from remote areas (ABS, 2016). Almost a third of respondents from remote areas reported major structural problems (AIHW, 2017). Several housing questions in the NATSISS are based on the ability to carry out Healthy Living Practices and are comparable to those used in direct-observation housing studies in remote communities.

The proportion of remote Aboriginal households who report housing problems in self-report surveys, particularly the NATSISS, are considerably lower than those assessed to have problems in the direct-observation studies noted above (AIHW, 2017). For instance, one direct-observation study of over 4,300 houses in remote Aboriginal communities across Australia between 1999 and 2006 found that only 6% of houses had adequate facilities to store, prepare and cook meals (Torzillo, Pholeros et al., 2008) and in another direct observation study in Northern Territory communities in 2003-04, only 21% of remote households passed this test (Bailie, Stevens et al., 2010). But in the 2002 NATSISS⁴, 83% of respondents from remote areas reported that they had working facilities for preparing food (including adequate cupboard space) (AIHW, 2017). Only 16% of houses in a direct-observation study of Northern Territory remote communities housing passed the test for adequate facilities to wash people (Bailie, Stevens et al., 2010), while 96% of NATSISS respondents from remote communities reported that their facilities for washing people were working (AIHW, 2017). Likewise, in large audits of rural and remote Aboriginal housing in NSW from 1999-2009, only 27% of houses were judged to have functioning facilities to wash clothes or bedding (laundry services with or without a washing machine) (NSW Department of Health, 2010) and a similar proportion of homes (29%) passed this test in remote Northern Territory communities (Bailie, Stevens et al., 2010), whereas 96% of remote householders reported that they had working facilities for washing clothes and bedding in the 2002 NATSISS (AIHW, 2017).

These differences may in part reflect participation bias, slight differences in the wording of measures, or low community expectations of housing facilities in remote areas; regardless, the differences are large and consistently present between self-report and direct-observation studies, suggesting that self-report surveys are likely to provide underestimates of housing problems in remote Aboriginal communities.

1.7 Remote Aboriginal housing and health

Almost all of the research into Aboriginal housing and health has been conducted with remote Aboriginal communities (Phibbs and Thompson, 2011). Several direct-

⁴ Subsequent NATSISS report similar figures (AIHW, 2017). The 2002 NATSISS results are cited here to best align with the dates when direct observation studies were conducted.

observation studies have examined housing and health associations. Some of these studies were cross-sectional; for example, Bailie et al. (2010) explored the relationship between directly-observed housing conditions and self-reported health outcomes for Aboriginal children living in ten remote communities in the Northern Territory. Strong independent associations were found between several specific housing exposures and reported child health outcomes, including: skin infection and poor temperature control; gastroenteritis and hygienic state of food preparation and storage areas; and poor overall functional condition and respiratory infection (Bailie, Stevens et al., 2010).

Another cross-sectional study found associations between health service presentations for skin infection and building age, the absence of facilities to remove faeces, and the presence of concrete flooring, which were exacerbated by crowding (Bailie, Stevens et al., 2005). Environmental health surveys conducted in remote Aboriginal communities in Western Australia have likewise identified strong and significant cross-sectional associations between housing (self-reported problems with crowding and poor dwelling conditions) and reported community-level health concerns, including gastrointestinal, hearing, eyesight and skin health problems (Melody, Bennett et al., 2016). Longitudinal studies in remote communities meanwhile have reported significant associations between household crowding and clinical assessment of carriage of otitis media-associated bacteria (Jacoby, Carville et al., 2011), and reduced school attendance (Silburn, 2014).

Two main housing interventions in rural and remote Aboriginal communities have been formally evaluated with regard to health impact (Bailie, Stevens et al., 2012, NSW Department of Health, 2010). Studies of government housing improvement programs in remote Aboriginal communities in the Northern Territory, which included the construction of new houses but not the renovation or repair of existing homes, found no consistent, significant reduction in carer report of child illness (n=418), nor any clear improvement in the mental health of carers with young children (n=328) (Bailie, McDonald et al., 2011, Bailie, Stevens et al., 2012, Bailie, Stevens et al., 2014). The authors of these papers argue that improved housing conditions alone are not enough, that housing improvement projects must also alleviate crowding and be supported by hygiene education and other community-wide social and environmental health

improvement programs to improve health in remote communities (Bailie, McDonald et al., 2011, Bailie, Stevens et al., 2012, Bailie, Stevens et al., 2014, McDonald, Bailie et al., 2008, McDonald, Bailie et al., 2010).

NSW Health conducted an evaluation of 'Housing for Health', a housing intervention program developed by Healthabitat (NSW Department of Health, 2010). The program had been delivered to 9524 Aboriginal people in 71 rural and remote communities across NSW over a ten year period, chiefly in homes run by Indigenous Community Housing Organisations (NSW Department of Health, 2010). A standardised 'survey and fix' framework for assessing and improving aspects of housing most crucial for health in remote Aboriginal communities was developed by Healthabitat in the mid-1980s (Pholeros, Rainbow et al., 1993). The framework focused on measuring and improving the function of 'health hardware', a term used to describe basic facilities like clean running water and waste removal, required to support the nine healthy living practices. These practices include: washing people; washing clothes and bedding; removing waste safely; improving nutrition; reducing overcrowding; reducing the impact of animals, vermin or insects; reducing dust; controlling temperature; reducing trauma (Torzillo, Pholeros et al., 2008). The NSW Health evaluation was performed by linking geocoded housing data with hospital admissions data. Amongst other benefits, the residents of households who received HfH had 40% lower rates of hospital separation for infectious diseases than in matched communities who did not receive the program (NSW Department of Health, 2010).

1.8 Urban Aboriginal housing

Major cities and large regional towns offer geographical proximity to developed employment and housing markets, but physical distance is not the only barrier to accessing these markets or other resources and services (Ware, 2013b, Zubrick, Lawrence et al., 2004). While 79% of Aboriginal people live in non-remote areas (AIHW, 2015), Aboriginal people are a minority group in these communities and are more likely to experience socioeconomic disadvantage than their non-Aboriginal neighbours on a range of measures (Biddle, 2009a).

Most of what is known about urban Aboriginal housing comes from national, population-based, cross-sectional surveys like the Census and the NATSISS (ABS, 2016, Biddle, 2011b, 2012b). Other sources of information include the National Social Housing Survey, LSIC, WAACHS and LSAC (AIHW, 2013b, Department of Social Services, 2015, Hunter, 2008, Silburn, Zubrick et al., 2006). These surveys have collected self-report data about crowding, tenure type and mobility. Some also asked questions about housing affordability and dwelling conditions, although as previously noted, the level of detail of the dwelling quality data gathered varies greatly between studies and self-reported assessment of housing quality may not be as robust as expert assessment. Throughout this section, data will be reported as it is in the literature – sometimes data are reported only for those in areas of no isolation (major cities), sometimes for urban areas (major cities and inner regional areas) and sometimes for non-remote areas (major cities, inner regional and outer regional areas).

There is evidence to suggest that housing issues may be as much of a problem in urban Aboriginal areas as in remote communities, although they differ in nature and severity. Some housing problems, such as housing affordability stress and rising damp, appear to be more prevalent for urban Aboriginal people than for those in remote areas (AIHW, 2017, Biddle, 2012b). Also, several housing problems which affect a smaller *proportion* of urban than remote Aboriginal people affect larger numbers of urban people in absolute terms, due to the larger number of Aboriginal people living in urban areas. For instance, 52% of Aboriginal adults (18 years and over) in remote areas reported living in homes that met the criteria for crowding in the 2008 NATSISS, compared to 20% in non-remote areas, but population estimates using these proportions indicate that more Aboriginal adults in crowded homes live in non-remote areas (76,547) than in remote areas (65,560) (AIHW, 2013a). Likewise, while 34% of Aboriginal households in remote areas were reported to live in homes with major structural problems in the 2008 NATSISS, compared to 25% of Aboriginal households in non-remote areas, this equates to 39,302 homes with major structural problems in non-remote communities and 11,138 in remote communities (AIHW, 2013a). That said, this is a measure of the presence or absence of housing problems. There may be additional complexities around the severity of problems not captured in these measures and, as

previously noted, self-report may provide an undercount of housing problems in remote communities.

Forty percent of Aboriginal households in urban Australia own their homes, approximately 32% rent in the private market and 22% rent from a social housing provider⁵ (compared to non-Aboriginal Australians, of whom 68% owned and 29% were renting at the 2011 Census) (AIHW, 2014c). Home ownership rates are slightly higher in urban NSW; for example, in the 2011 Census, 44% of Aboriginal people in the Sydney/Newcastle Aboriginal Land Council area owned or were purchasing their homes, 30% were renting privately, 23% rented from a State Housing Authority (Housing NSW or the Aboriginal Housing Office) and 2% were renting from a Community Housing Provider Community Housing Provider (Biddle, 2012a). In urban NSW, fewer Aboriginal households rent from Aboriginal Community Housing Providers than in remote NSW and the proportion renting from mainstream NGO-run Community Housing Providers is growing (Milligan, Phillips et al., 2011b)⁶.

Crowding is variously defined in different studies, as are geographical regions, but four main studies have reported crowding rates by level of remoteness (AIHW, 2014c, Biddle, 2012b, Department of Social Services, 2012, Silburn, Zubrick et al., 2006). Aboriginal people in non-remote areas are much more likely than non-Aboriginal people in the same areas to experience crowding (20% versus 5% for adults aged 18 and over, respectively) (AIHW, 2013a). Estimations of the proportion of Aboriginal households in major cities that are crowded vary between 6% (Department of Social Services, 2012), 7% (Silburn, Zubrick et al., 2006) and 10% (AIHW, 2014c, Biddle, 2012b). In areas of low isolation, or inner regional areas, the proportion of households which met criteria for crowding were either similar or slightly higher as those for cities (13% of those in areas of low isolation in LSIC) (AIHW, 2014c, Department of Social Services, 2012, Silburn, Zubrick et al., 2006).

⁵ Latest available urban data.

⁶ Precise figures for urban NSW not published.

Residential mobility data of some kind have been gathered for urban Aboriginal households in six studies (see Table 1.1). Comparison data of residential mobility for urban Aboriginal and non-Aboriginal people could not be obtained, but across Australia the Aboriginal population is not significantly more mobile than the non-Aboriginal population on age-standardised measures (Biddle, 2012c, Taylor and Bell, 2012). The measures of mobility used vary between studies, as do the findings reported. In WAACHS, 36% of children in areas of no isolation had lived in five or more homes since birth, significantly more than those in areas of extreme isolation (13%) (Zubrick, Silburn et al., 2005). However, LSIC families in areas of high or moderately high isolation were one and a half times as likely as those from 'urban and regional' areas to move house (proportions not published) (Department of Social Services, 2015). An adjusted longitudinal analysis of mobility using two waves of LSIC data indicated that remoteness did not significantly affect housing mobility once other householder attributes were taken into account (Biddle, 2012c).

Three studies reported data about housing affordability for Aboriginal people in non-remote areas. Census data suggest that Aboriginal Australians experience housing affordability stress at similar rates to non-Aboriginal Australians (33% versus 27%) (Biddle, 2012b), although Aboriginal participants in both HILDA and LSAC were twice as likely to experience housing affordability stress as non-Aboriginal participants using objective and subjective measures (Baker, Mason et al., 2014, Dockery, 2013). Analysis of Census data by geographical region shows that Aboriginal households in many urban areas are only slightly more likely to be in housing affordability stress than their non-Aboriginal neighbours (Biddle, 2012b). For instance, in the Sydney-Wollongong region, 43% of Aboriginal renters were in housing affordability stress versus 38% of non-Aboriginal renters (Biddle, 2012b). Larger differences were observed between Aboriginal people by tenure type; 15% of Aboriginal owner-occupiers were experiencing housing affordability stress compared to 43% of Aboriginal renters in the Sydney-Wollongong region at the 2011 Census (Biddle, 2012b).

The housing conditions of urban Aboriginal households are generally reported to be poorer than those of non-Aboriginal households (Baker, Lester et al., 2016, Dockery,

2013), but better than those of Aboriginal people in remote communities (Biddle, 2011b, Department of Social Services, 2012, Silburn, Zubrick et al., 2006). Four studies report separate data about dwelling conditions for urban or non-remote Aboriginal households, in varying levels of detail. Aboriginal children participating in LSAC had a mean score of 3.28 on the single subjective measure of dwelling condition (scale 1-4), which, while above 3 ('fair condition' on the scale), was significantly lower than the mean score for non-Aboriginal participants (3.75) (Dockery, 2013).

However, a quarter of Aboriginal households in non-remote areas reported one or more major structural problem in the latest NATSISS (AIHW, 2017). Physical dwelling problems most commonly reported included major cracks in walls or floors (10%), sinking or moving foundations (6%) and major plumbing problems (5%) (AIHW, 2017). Four percent reported rising damp, a major roof defect or major electrical problems (AIHW, 2017). Other studies did not report dwelling conditions for 'urban' or 'non-remote' households, but instead reported this by individual level of isolation. In WAACHS, 8% of participants in areas of no isolation reported three or more indicators of poor housing quality (indicators included ability to wash children, clothes, remove waste, prepare food, control dust and crowding) (Silburn, Zubrick et al., 2006). Similarly, 91% of LSIC children in areas of no isolation lived in homes with all rated facilities working (e.g. flushing toilet, bath or shower, fridge, washing machine, heater) (Department of Social Services, 2012).

Only one study has examined the relationship between tenure type and other housing factors *within* non-remote Aboriginal households. In cross-sectional analyses of NATSISS data, non-remote renters were significantly more likely to report crowding, major structural problems and non-functioning facilities than non-remote owner occupiers (Biddle, 2011b). Non-remote dwellings rented from state or territory housing organisations also tended to have worse outcomes on these measures than those rented privately or from a Community Housing Provider (Biddle, 2011b).

There have also been three qualitative studies into urban Aboriginal housing that have described the difficulties many Aboriginal people in urban areas have with housing

access, affordability and insecurity. One study with homeless Aboriginal people in Sydney, most of whom slept in public places, investigated their lived experiences and pathways into homelessness (Memmott, Chambers et al., 2005). Factors such as poverty, poor physical and mental health, violence, abuse, racism, histories of unstable housing and drug and alcohol use were named as key precipitating forces associated with homelessness for urban Aboriginal people (Memmott, Chambers et al., 2005). Another study examined the housing careers of Aboriginal people in Perth and two regional towns in Western Australia (Birdsall-Jones and Corunna, 2008). This work highlighted the role of poverty, unaffordable housing, instability and fraught relationships with state housing authorities in shaping urban Aboriginal people's housing experiences and found that home ownership is not considered a feasible aspiration for many (Birdsall-Jones and Corunna, 2008). Another study examined the provision of social housing for urban Aboriginal people in NSW, Queensland and Victoria (Milligan, Phillips et al., 2011b). This work chiefly involved interviews with social housing and government employees and concluded that targeted, culturally appropriate housing services are essential for urban Aboriginal people, but not always being achieved for several reasons, including the fact that urban Aboriginal people constitute a small fraction of the population in cities and large towns (Biddle, 2009b, Milligan, Phillips et al., 2011b).

1.9 Urban Aboriginal housing and health

1.9.1 Studies of housing and health in urban (and non-remote) Aboriginal populations

Only three studies have either examined links between housing and health in an exclusively non-remote Aboriginal sample, or reported association results separately for those Aboriginal participants from non-remote areas (see Table 1.1). While examining different questions, all showed significant associations between housing factors and aspects of health and wellbeing. Two of these studies were cross-sectional, one was longitudinal and all three were based on self-report housing data. One cross-sectional study examined the factors associated with social and emotional wellbeing in 1005 of those urban Aboriginal children participating in the Study of Environment on Aboriginal Resilience and Child Health (SEARCH), the cohort being studied as part of this thesis.

SEARCH children who had lived in four or more homes since birth had significantly lower odds of good mental health (Williamson, D'Este et al., 2016).

The second cross-sectional study examined associations between self-reported 'household number' and ear health in 453 children attending an Aboriginal Medical Service in Brisbane (Spurling, Askew et al., 2014). Households who had eight or more usual residents were defined as crowded; however, the study authors acknowledged that in the absence of any data about the size or nature of participants' housing, this was technically a study of family size and not crowding. The study found that Aboriginal children who lived in households with eight or more people had nearly four times the odds of abnormal middle ear appearance, a proxy for middle ear disease, than those in homes with less than eight people (Spurling, Askew et al., 2014).

The longitudinal study examined associations between housing and health in Aboriginal children from non-remote areas participating in three waves of the LSAC. LSAC is a study of Australian children that did not recruit any children from remote areas, so the few participating Aboriginal children were all from metropolitan or regional areas. Thus a non-remote Aboriginal cohort was created, albeit a relatively small and geographically scattered one (417 children in wave 1, down to 273 in wave 3) (Dockery, 2013). As the survey was not designed with Aboriginal children in mind, 'relevant questions may have been omitted from the LSAC questionnaires that were critical to understanding the unique situation and development of Indigenous children' (Hunter, 2008, p. 61); unfortunately this included detailed questions about dwelling conditions. Even so, carer-reported information about crowding, affordability, mobility and tenure type and interviewer judgement of the external appearance of the dwelling appearance was gathered. Poor external dwelling appearance was associated with poorer carer-rated child physical health and socio-emotional wellbeing, living in social housing was associated with poorer socio-emotional wellbeing and poorer learning outcomes and crowding was associated with poorer learning outcomes in Aboriginal children participating in LSAC (Dockery, 2013).

Table 1.1: Summary of studies that have quantified links between housing and health in Aboriginal people that include those living in non-remote areas

Ref	Study/ Data source	Study Design	Location	Self-report	Number of Aboriginal participants from urban areas (or non- remote)	Housing factors examined	Health outcomes examined	Rel'nships reported separately for urban? (or non-remote)	Findings
1	Brisbane Ear Study	Cross-sectional	Brisbane QLD	Crowding: Yes Ear: Direct observ'n	453 urban children	Number of people in household	Abnormal middle ear appearance	Yes	Living in a household with 8+ people associated with higher odds of abnormal inner ear appearance
2	SEARCH Wave 1	Cross-sectional	Urban NSW	Yes	1005 urban children	Mobility	Mental health measure	Yes	Living in 4+ homes since birth associated with lower odds of good mental health
3	LSAC Waves 1-3	Longitudinal (decomposition analysis)	National (all areas except remote)	Yes (except for interviewer rating of external dwelling condition)	Wave 1: 417 non-remote children ± Wave 3: 273 non-remote children	Mobility; Crowding; Affordability; Tenure type; Appearance of dwelling exterior	Physical health measure; Mental health measure; Learning outcomes (language and literacy)	Yes	Poor external dwelling associated with poor physical and mental health. Social housing tenure associated with poor mental health and learning outcomes. Crowding associated with poor learning outcomes.
4	NATSISS 2008	Cross-sectional	National	Yes	3322 urban adults (46%) Major cities: 2078, Inner regional: 1244, Outer regional: 1370, Remote or Very remote: 2471	Mobility; Crowding; Tenure type; Major structural problems; Facilities not working;	Self-rated health; Mental health (reported happiness and sadness)	No	Moving in past 5 yrs associated with poor mental health. Renting from state housing associated with poor self-rated health. Renters more likely than owners to report feelings of sadness (worst for those in state housing). Structural problems associated with poor health and mental health. Facilities not working associated with poor mental health.

Table 1.1 (Cont'd)

Ref	Study/ Data source	Study Design	Location	Self-report	Number of Aboriginal participants from urban areas (or non- remote)	Housing factors examined	Health outcomes examined	Rel'nships reported separately for urban? (or non-remote)	Findings
5	NATSISS 2008	Cross-sectional	National	Yes	3020 urban children (49%) <i>Major cities:</i> 1852, <i>Inner regional:</i> 1168, <i>Outer regional:</i> 1068, <i>Remote or Very remote:</i> 2056	Mobility; Crowding; Tenure type; Major structural problems; Facilities not working;	Presence of a health condition (ear/ hearing, eye/ sight, or teeth/ gum); If 'aspects of child health have led to carer concern about child's learning'; School attendance; Informal learning time with carer	No	Structural problems associated with presence of a health condition, carer concern about child learning due to health, reduced school attendance, and more informal learning time with carer. Facilities not working associated with carer concern about child learning due to health. Crowding associated with reduced school attendance and less informal learning time with carer. Moving associated with presence of a health condition, concern about health interfering with learning and more informal learning time with carer.
6	LSIC Waves 1-2	Longitudinal	National	Yes	867 urban children (51%) <i>Major cities:</i> 439, <i>Inner regional:</i> 428, <i>Outer regional:</i> 227, <i>Remote or Very remote:</i> 593	Tenure type; Dwelling type; Crowding; Mobility; Home needs major repairs	Parental concern about: general health; social skills and behaviour; learning and development.	No	Social housing tenure associated with good general health and no learning/development concerns compared to those not in social housing. Home needing major repairs associated with concern reported about social skills/behaviour and learning difficulties, but better general health.

Table 1.1 (Cont'd)

Ref	Study/ Data source	Study Design	Location	Self-report	Number of Aboriginal participants from urban areas (or non- remote)	Housing factors examined	Health outcomes examined	Rel'nships reported separately for urban? (or non-remote)	Findings
7	LSIC Waves 1-4	Longitudinal	National	Yes	867 urban children (51%)	Crowding; Home needs major repairs; Housing problem/ event in past year (felt crowded, moved house, or had other housing problem)	General health; ear problem; eye problem; skin infection; chest infection; cold/hayfever; diarrhoea or intestinal problems; asthma; eczema; other health problem; hospitalisation in past year	No	Crowding associated with ear problems. Home needing major repairs associated with diarrhoea/intestinal problems and chest infection. A housing event/problem in past year was associated with ear problems and skin infection.
8	LSIC Wave 1 (& 2)	Cross-sectional analysis of wave 1 data. + factor analysis of changes between waves 1 & 2	National	Yes	876 urban Adults (carers of LSIC children as above)	Mobility; Tenure type; Home needs major repair; Housing problem/event in past year (felt crowded, moved, other problem)	Mental health (2 measures)	No	Home needing major repairs associated with poorer mental health in one measure, but not the other. Housing problem in past year associated with a significant decline in carer mental health between waves 1-2.

Table 1.1 (Cont'd)

Ref	Study/ Data source	Study Design	Location	Self-report	Number of Aboriginal participants from urban areas (or non- remote)	Housing factors examined	Health outcomes examined	Rel'nships reported separately for urban? (or non-remote)	Findings
9 10	WAACHS	Cross-sectional	WA	Yes	Children No isolation: 34% (n =1160 approx.) * Low isolation: 24% (n=970) Moderate/ extreme isolation: 41% (n=1650)	Mobility; Crowding; Tenure type; Dwelling quality (number of indicators of poor housing quality: 0,1,2,3+)	Mental health;	No	Living in 5+ homes associated with poorer mental health. Crowding associated with better mental health. Renting associated with poorer with poorer mental health compared to owning. 2+ indicators of poor housing quality associated with poor mental health (compared to 0-1)
11	WAACHS	Cross-sectional	WA	Yes	As above	Mobility; Crowding; Tenure type	School attendance and teacher-rated academic performance	No	Home ownership associated with better school attendance and academic performance than renting. Crowding associated with low academic performance. Living in 5+ homes since birth associated with better academic performance than 4 or fewer.

Ref	Study/ Data source	Study Design	Location	Self-report	Number of Aboriginal participants from urban areas (or non- remote)	Housing factors examined	Health outcomes examined	Rel'nships reported separately for urban? (or non-remote)	Findings
12	WAACHS	Cross-sectional	WA	Yes	Children No isolation: 34% (n=1820 approx.) * Low isolation: 24% (n=1290) Moderate/ extreme isolation: 41% (n=2170)	Tenure type; Dwelling quality (number of indicators of poor housing quality: 0,1,2,3+)	Asthma; Recurrent chest infection; Acute ear infection; Oral health; Injuries; Sensory function	No	No clear pattern in associations between housing and health. 3+ indicators of poor housing quality were associated with higher odds of ear infection, but lower odds of oral health problems and asthma. Children in homes owned outright had lower odds of asthma than those in other tenure types. They were also more likely to report oral health problems than those renting and more likely to report recurrent chest infection than those in homes being paid off.

* Proportions or weighted population estimates were reported rather than the number of study participants. The numbers in this table are approximations calculated on the basis of the reported total number of participants and the proportion of participants living in each level of isolation.

± LSAC includes children living on farms & outer regional areas

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2. Williamson, A., D'Este, C., Clapham, K., Redman, S., Manton, T., Eades, S., . . . Raphael, B. (2016). What are the factors associated with good mental health among Aboriginal children in urban New South Wales, Australia? Phase I findings from the Study of Environment on Aboriginal Resilience and Child Health (SEARCH). *BMJ Open*, 6(7). doi:10.1136/bmjopen-2016-011182
3. Dockery, A. M. (2013). *Housing and children's development and wellbeing: evidence from Australian data, AHURI Final Report No.201*. Melbourne: AHURI.
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5. Bath, J., & Biddle, N. (2011). *Measures of wellbeing for Indigenous children, Lecture 12. In: Measures of Indigenous Wellbeing and Their Determinants Across the Lifecourse, 2011 CAEPR Lecture Series*. Canberra: CAEPR, ANU.
6. Dockery, A. M. (2013). *Housing and children's development and wellbeing: evidence from Australian data, AHURI Final Report No.201*. Melbourne: AHURI.
7. Brandrup, J. (2013). How do housing conditions affect the health of Indigenous Australian children over time? *Footprints in Time. The Longitudinal Study of Indigenous Children, Report from Wave 4*. Canberra: FaHCSIA, Australian Government.

8. Biddle, N. (2011). *An Exploratory Analysis of the Longitudinal Survey of Indigenous Children. Working paper No. 77*. Canberra: Australian National University, Centre for Aboriginal Economic Policy Research.
9. Shepherd, C., Jianghong, L., Mitrou, F., & Zubrick, S. (2012). Socioeconomic disparities in the mental health of Indigenous children in Western Australia. *BMC Public Health*, 12(756).
10. Silburn, S. R., Blair, E., Griffin, J. A., Zubrick, S. R., Lawrence, D. M., Mitrou, F. G., & De Maio, J. A. (2007). Developmental and environmental factors supporting the health and well-being of Aboriginal adolescents. *International Journal of Adolescent Medicine and Health*, 19(3), 345-354
11. Zubrick, S., Silburn, S., De Maio, J., Shepherd, C., Griffin, J., Dalby, R., Mitrou, F., Lawrence, D., Hayward, C., Pearson, G., Milroy, H., Milroy, J. and Cox, A. (2006). *The Western Australian Aboriginal Child Health Survey: Improving the Educational Experiences of Aboriginal Children and Young People*. Perth, Curtin University of Technology and Telethon Institute for Child Health Research.
12. Shepherd, C. J., Li, J., & Zubrick, S. (2012). Socioeconomic disparities in physical health among Aboriginal and Torres Strait Islander children in Western Australia. *Ethnicity & Health*, 1-23. doi:10.1080/13557858.2012.654768.

1.9.2 Studies of housing and health in combined remote and non-remote

Aboriginal populations

In the absence of further specific studies of housing and health with urban Aboriginal people, those which include participants from both remote and non-remote areas offer some insight. Due to the small body of research in this space, studies of the health of Aboriginal children and adults are included. All of the research discussed in this section uses self-reported survey data from three sources: LSIC, WAACHS and the 2008 NATSISS. More than one paper has been written from each source (see Table 1.1 for more detail). Most of the analyses of LSIC data are longitudinal, while analyses based on NATSISS 2008 and WAACHS are cross-sectional.

Although the definitions of remoteness vary between studies, roughly half of the participants in each are from urban areas (major cities and inner regional areas, or areas of no or low isolation, as per Table 1.1). An issue with each of the studies discussed in this section is that health associations are not reported separately for Aboriginal people who live in urban (or non-remote) areas. While most analyses adjusted for level of remoteness, this does not allow us to determine to what extent results are attributable to those people living in urban versus remote areas. These studies, which reported housing and health associations for Aboriginal people in all areas of remoteness together (i.e. remote and non-remote areas combined), will be referred to as 'combined studies' in this section. The way in which housing factors have been conceptualised and measured differs between studies, as do the health and wellbeing factors examined, an overview of the key findings is provided below, organised by the broad category of housing issue examined.

All three combined study sources collected data about aspects of self-reported dwelling quality (see Table 1.1). Poor dwelling quality was generally associated with poorer mental health for adults and children and poorer outcomes on some, but not all, physical health measures. Aboriginal adults who reported major structural problems in the 2008 NATSISS were more likely to report poor/fair general physical health status and poor mental health outcomes than those in homes with no major structural problems reported (Biddle, 2011b). Non-functioning facilities were associated with poor

mental health outcomes but not with physical health (Biddle, 2011b). Amongst children participating in the 2008 NATSISS, major structural problems were associated with poorer carer-reported physical health, reduced school attendance and carer concern about aspects of child health interfering with their learning (Bath and Biddle, 2011). A cross-sectional study of WAACHS children found significant associations between self-reported dwelling conditions and mental health, but no clear pattern of effect on physical health problems overall, although having 3 or more indicators of poor quality housing was associated with a higher odds of carer-report of ear infection and lower odds of asthma and oral health problems (Shepherd, Li et al., 2012). A cross-sectional analysis of Wave 1 LSIC data found that carers who reported their home needed major repairs were more likely to report poor mental health on one measure but not another (Biddle, 2011a). Living in a home in need of major repairs was also associated with parental concern about children's social skills, behaviour and learning/development and, surprisingly, with better general health in a longitudinal analysis of LSIC data (waves 1-2) (Dockery, 2013). Another longitudinal analysis of LSIC data (waves 1-4) found that children living in homes in need of major repairs had higher odds of diarrhoea/ intestinal problems and chest infection, but not of poorer general health or seven other common health issues (Brandrup, 2013).

Household crowding was measured in all three combined study sources, albeit using different definitions. Findings about the links between crowding and health and wellbeing in these studies are mixed. Crowding was not associated with physical or mental health outcomes in Aboriginal adults or children in cross-sectional analyses of 2008 NATSISS data, but it was associated with reduced child school attendance and having less informal learning time with their carer (Bath and Biddle, 2011, Biddle, 2011b). Cross-sectional analyses of WAACHS data likewise found that crowding was associated with reduced school attendance (Zubrick, Silburn et al., 2006), but also found that children and adolescents in crowded homes had higher odds of good mental health than those in homes that did not meet crowding criteria (Shepherd, Jianghong et al., 2012, Silburn, Blair et al., 2007). In longitudinal studies of LSIC data, crowding was associated with increased odds of ear infection in children, but no other child physical health issues (Brandrup, 2013) or social/behavioural and learning/developmental

outcomes (Dockery, 2013). In carers of children participating in LSIC, crowding was associated with a significant decline in mental health between data collection waves 1 and 2 (Biddle, 2011a).

Both of the cross-sectional combined studies found associations between residential mobility and health in Aboriginal Australians (Biddle, 2011b). WAACHS children and adolescents who had lived in five or more different homes since birth were more likely to be at high risk of clinically significant emotional or behavioural difficulties than children who had lived in four or fewer homes (Shepherd, Jianghong et al., 2012, Zubrick, Silburn et al., 2005). Children participating in the 2008 NATSISS who had moved in the past 5 years were more likely to have their parents report a physical health condition, along with concern that their health was interfering with their learning (Bath and Biddle, 2011). Adults participating in the 2008 NATSISS who reported having moved in the past 5 years reported poorer mental health than those who had not moved (Biddle, 2011b). However, longitudinal studies of LSIC data did not find associations between frequent residential moves and measures of general health, social and emotional wellbeing or learning outcomes in children (Dockery, 2013) or with mental health in carers of children participating in LSIC (Biddle, 2011a).

All three combined study sources also examined associations between tenure type and health and wellbeing in combined remote and urban Aboriginal populations. Where significant associations were found, owner-occupied housing tended to be associated with better health and wellbeing. In WAACHS, children in owned homes had higher odds of good mental health, school attendance and academic performance than those in rented homes (Shepherd, Jianghong et al., 2012, Zubrick, Silburn et al., 2006). Children in owned homes also had lower odds of asthma than those in other tenure types, but they also had higher odds of recurrent chest infection and oral health problems than those in homes being paid off. Adults participating in the 2008 NATSISS who were renting from a state housing authority were more likely to report poorer general physical health and poorer mental health in cross-sectional analyses than those in owner occupied dwellings (Biddle, 2011b). They were also more likely to report poor or fair health than those renting from an Indigenous or other Community Housing

Provider (Biddle, 2011b). A study of LSIC data (waves 1-2) found that children in social housing had better carer-reported general health and learning outcomes than those renting privately or in owned homes, though there was no significant association between tenure type and mental health (Dockery, 2013). Tenure type was not associated with mental health for carers of LSIC children (Bath and Biddle, 2011).

LSIC also used a composite housing measure, asking carers if they had 'any housing problem or event in the past year', which could include moving house, feeling crowded where they live or any other housing problem (Brandrup, 2013). This measure was associated in longitudinal analyses with ear problems and skin infection in children (Brandrup, 2013) and with a decline in mental health for the carers of children participating in LSIC between data collection waves 1 and 2 (Biddle, 2011a).

1.10 Summary of knowledge gaps regarding urban Aboriginal housing and health

There are several key gaps in the knowledge base about the relationship between housing and health for urban Aboriginal Australians. Very little research has been conducted in this space. Most of what is known comes from three urban studies based on self-report data, two of which have relatively small samples and employ nebulous housing measures. The data used in two of these three studies are cross-sectional (Spurling, Askew et al., 2014, Williamson, D'Este et al., 2016), while the other is longitudinal (Dockery, 2013).

What else is known about housing and health for urban Aboriginal people is fragmented and, importantly, is largely inferred from combined studies that do not report findings for Aboriginal people from remote and urban areas separately. This is problematic because housing is partly an issue of place. The availability and quality of housing is determined by local factors including housing markets, policies, services and cultural factors (Biddle, 2012b, Keall, Baker et al., 2010) and the way in which housing impacts on health will also differ from place to place (Howden-Chapman, Crane et al., 2011). For instance, poor housing in a cold climate may be different in some respects to what constitutes poor housing in a tropical environment and will expose residents to

different health issues in these different settings (Howden-Chapman, Crane et al., 2011, Ormandy and Ezratty, 2012, Wilson, Gerard Morgan et al., 2013). Australia is a large country, within which there are vastly diverse climate zones, environmental, social and economic settings (Randolph and Holloway, 2005, Sanders, 2008). Thus findings from studies in remote communities are not necessarily directly applicable to Aboriginal people living in urban areas. These studies have also tended to use high-level, general measures of dwelling quality. Thus, we have remarkably scant data about how housing may impact the health and wellbeing of urban Aboriginal people or the role that specific housing factors may play. Moreover, there is very little qualitative data available to provide insights into how urban Aboriginal people view their housing conditions, what the critical issues are for them, or if they think housing may relate to their health and wellbeing. There have been no detailed examinations of housing conditions in urban Aboriginal communities integrated with peoples' views about their housing.

It is not yet known to what extent findings about housing and health in other populations or contexts may also apply to Aboriginal people living in urban NSW, or what the most appropriate targets for housing improvement may be in relation to health. The knowledge that is available suggests that dwelling conditions, crowding, mobility and tenure type are associated with some aspects of health and wellbeing for Aboriginal people in urban areas. But there has been no detailed, focused examination of the housing conditions and experiences of urban Aboriginal people in relation to health. This thesis aims to add detailed, granular information about the extent to which different types of housing problems and cumulative housing disadvantage are experienced by a cohort of urban Aboriginal families and whether and how housing disadvantage is associated with health in this sample. This includes an examination of what urban Aboriginal people believe are the most crucial housing problems to examine. This information is urgently required to build an evidence base about what the issues are and what the most appropriate targets for housing improvement may be in relation to health.

1.11 The Study of Environment on Aboriginal Resilience and Child Health (SEARCH)

This thesis builds on and extends a large program of work examining the health of urban Aboriginal children to investigate the housing situation of urban Aboriginal families in NSW. The Study of Environment on Aboriginal Resilience and Child Health (SEARCH) is the largest cohort study of urban Aboriginal children in Australia, with 1467 children aged 0-17 years from 620 families taking part. It is the result of collaboration between the Aboriginal Health and Medical Research Council of New South Wales (AH&MRC), researchers, and four Aboriginal Community Controlled Health Organisations (ACCHOs) located in major cities and inner regional areas in NSW, where participants are recruited:

- Aboriginal Medical Service Western Sydney, Mount Druitt - *major city*
- Tharawal Aboriginal Corporation, Campbelltown - *major city*
- Riverina Medical and Dental Aboriginal Corporation, Wagga Wagga - *inner regional*
- Awabakal Newcastle Aboriginal Cooperative, Newcastle - *part major city, part inner regional* (Australian Government, 2017)

Ethics approval was obtained from the Aboriginal Health and Medical Research Council (reference 586/06) and the University of Sydney (reference, 12-2003/9429).

In accordance with the wishes of participating communities, SEARCH aims to investigate the factors associated with health and illness in urban Aboriginal children in NSW over time. Data on child health outcomes are collected using carer report surveys and direct clinical measures. The health outcomes of interest include infectious disease (gastrointestinal, ear, skin and chest), injury, asthma, developmental delay, speech and language, obesity and social and emotional wellbeing. Data about a range of environmental, social, cultural and behavioural factors are also collected (information about recruitment, participation and measures used are provided in **Chapter 4**, and in Appendices G and H). Aboriginal leaders in NSW who were consulted during the planning phase of SEARCH nominated housing as a key research priority (The SEARCH Investigators, 2010) and thus it has been an integral component of the program from the outset.

1.12 Thesis aims and structure

This thesis aims to provide the first detailed, systematic study of urban Aboriginal housing in identified communities by examining people's views about their housing along with survey data about their housing conditions. It also begins to explore whether housing is associated with urban Aboriginal child health in relation to one common health problem, gastrointestinal infection. It employs qualitative and quantitative research methods as described within each analysis chapter.

Chapter 2 of this thesis (*Study One*) examines the views of Aboriginal people in Western Sydney about their housing experiences and what effects, if any, housing issues have for Aboriginal people in their community.

Chapter 3 (*Study Two*) explores participant beliefs about why so many urban Aboriginal people experience the housing disadvantage they described, and how they make sense of and feel about their experiences in Sydney's housing market.

Chapter 4 (*Study Three*) describes the housing conditions of the SEARCH cohort using carer-reported survey data and examines differences in exposure to housing problems by tenure type. It also defines the housing factors examined in the SEARCH survey, namely: tenure type, crowding, residential mobility, affordability and several aspects of physical dwelling conditions.

Chapter 5 (*Study Four*) examines the cross-sectional associations between housing conditions and recurrent gastrointestinal infection in SEARCH children.

Chapter 6 discusses key learnings, limitations and policy implications of this body of work, along with suggestions for future research.

CHAPTER 2: *STUDY ONE*, FOCUS GROUP ACCOUNTS OF URBAN ABORIGINAL HOUSING AND HEALTH

2.1 Preamble

As outlined in **Chapter 1**, there is evidence that Aboriginal people living in urban parts of Australia have poorer quality housing than non-Aboriginal Australians. Little is known, however, about how urban Aboriginal people perceive their housing or the extent to which they consider it problematic in regard to health and wellbeing. The few existing qualitative studies that have included urban Aboriginal people's perspectives have chiefly focussed on issues to do with social housing service provision and the housing careers and aspirations of urban Aboriginal people (Birdsall-Jones and Corunna, 2008, Milligan, Phillips et al., 2011b).

This study took place at the Aboriginal Medical Service Western Sydney, an Aboriginal Community Controlled Health Service participating in SEARCH. Western Sydney is a relatively disadvantaged part of Sydney, approximately one hour's drive from the Central Business District. The clients and staff of this service were well placed to provide detailed answers to questions not yet addressed through existing research, including how Aboriginal people in disadvantaged urban areas describe their housing, whether they consider their housing to be problematic or satisfactory and whether they believe links exists between housing and health.

2.2 Copyright statement

I certify that this publication was a direct result of my research towards this PhD, and that reproduction in this thesis does not breach copyright regulations.

Andersen, M., Williamson, A., Fernando, P., Redman, S. and Vincent, F. (2016).

‘There’s a housing crisis going on in Sydney for Aboriginal people’: focus group accounts of housing and perceived associations with health.’ *BMC Public Health* 16(429).

Signed

A handwritten signature in dark ink, appearing to be 'Melanie Andersen', with a long horizontal stroke extending to the right.

Melanie Andersen

September 2017

2.3 Study One, 'There's a housing crisis going on in Sydney for Aboriginal people': focus group accounts of housing and perceived associations with health.

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Study One has been published in *BMC Public Health* (Andersen, Williamson et al., 2016)

2.4 Author contributions

Study conception and design: **MA**; AW; PF; SR; FV. Acquisition of data: **MA**; PF; FV. Data analysis and interpretation: **MA**; AW; PF. Writing of manuscript: **MA**. All authors read and gave critical feedback on the manuscript and approved the final manuscript.

2.5 Abstract

Background: Poor housing is widely cited as an important determinant of the poor health status of Aboriginal Australians, as for indigenous peoples in other wealthy nations with histories of colonisation such as Canada, the United States of America and New Zealand. While the majority of Aboriginal Australians live in urban areas, most research into housing and its relationship with health has been conducted with those living in remote communities. This study explores the views of Aboriginal people living in Western Sydney about their housing circumstances and what relationships, if any, they perceive between housing and health.

Methods: Four focus groups were conducted with clients and staff of an Aboriginal community-controlled health service in Western Sydney (n=38). Inductive, thematic analysis was conducted using framework data management methods in NVivo10.

Results: Five high-level themes were derived: the battle to access housing; secondary homelessness; overcrowding; poor dwelling conditions; and housing as a key determinant of health. Participants associated their challenging housing experiences with poor physical health and poor social and emotional wellbeing. Housing issues were said to affect people differently across the life course; participants expressed particular concern that poor housing was harming the health and developmental trajectories of many urban Aboriginal children.

Conclusions: Housing was perceived as a pivotal determinant of health and wellbeing that either facilitates or hinders prospects for full and healthy lives. Many of the specific health concerns participants attributed to poor housing echo existing epidemiological research findings. These findings suggest that housing may be a key intervention point for improving the health of urban Aboriginal Australians.

2.6 Background

Poor housing can affect health directly and indirectly and can have both short and long term health impacts (Dockery, Kendall et al., 2010, Marsh, Gordon et al., 2000, Thomson, Thomas et al., 2013). Housing is often named as a key determinant of the health and life expectancy gap between Aboriginal and Torres Strait Islander Australians (hereafter Aboriginal) and non-Aboriginal Australians (AIHW, 2015). 'Healthy

Homes' are one of seven action areas in the Coalition of Australian Governments' 'Closing the Gap' Campaign (Council of Australian Governments, 2009), a recognition both of Aboriginal housing disadvantage and of the growing body of international evidence about the associations between housing conditions and human health (Thomson, Thomas et al., 2013, Ware, 2013a, WHO, 2006).

Studies in remote Aboriginal communities in Australia have found major problems with housing quality and availability (Bailie and Runcie, 2001, Torzillo, Pholeros et al., 2008). Associations have been demonstrated between poor remote housing and specific health problems, e.g. poor overall functional condition of housing and respiratory infection (Bailie, Stevens et al., 2010, NSW Department of Health, 2010). Studies of the health of Aboriginal children living across urban, regional and remote areas have found associations between reported housing problems and ear, skin and chest infections (Department of Social Services, 2013, Silburn, Zubrick et al., 2006). Similar housing and health problems have been documented amongst indigenous peoples living in Canada, North America and New Zealand (Anderson and Collins, 2014, Riva, Plusquellec et al., 2014).

As is the case with Aboriginal health research in Australia (Eades, Taylor et al., 2010, Priest, Mackean et al., 2009), the majority of Aboriginal housing research and policy has focussed on Aboriginal people in remote communities (Biddle, 2012b, Ware, 2013a). However, approximately 79% of Aboriginal Australians live in urban areas or major regional centres (AIHW, 2015) and 60% of the burden of illness amongst Aboriginal people is accounted for by those living outside remote areas (Vos, Barker et al., 2009). The data available suggest urban Aboriginal households also experience significant housing disadvantage and they are more likely to live in unaffordable housing than those in remote areas (Biddle, 2012b). A qualitative study with Aboriginal people in Perth and regional Western Australia described housing careers characterised by poverty, difficulty accessing affordable housing, racism, insufficient social housing, difficulty navigating the social housing system, overcrowding, forced evictions and insecure tenure (Birdsall-Jones and Corunna, 2008). Aboriginal leaders have called for

greater recognition of the housing needs of urban Aboriginal people (Koziol, 2014, 14th April, Narushima, 2009, October 8), yet direct research and policy activity in this space remains limited (Biddle, 2012b, McDonald, 2011, Milligan, Phillips et al., 2011b).

The current study examines the housing experiences of Aboriginal people living in Western Sydney. It is part of the Study of Environment on Aboriginal Resilience and Child Health (SEARCH), a cohort study of 1482 urban Aboriginal children in New South Wales, Australia (The SEARCH Investigators, 2010). Housing is a focus area in SEARCH, having been nominated by urban Aboriginal community leaders as a key concern in relation to health. SEARCH is the result of a long-term collaboration between the Aboriginal Health and Medical Research Council of New South Wales, the Sax Institute, University of Sydney, Australian National University, Sydney Children's Hospital Network, policy and program agencies and four Aboriginal community-controlled health services (ACCHS) located in Western Sydney, South Western Sydney, Newcastle and Wagga Wagga.

2.7 Methods

2.7.1 Setting

This research took place at the Aboriginal Medical Service Western Sydney (AMSWS) in the Blacktown Local Government Area of Sydney, Australia. This residential area, 40km west of the Sydney Central Business District, is home to more urban Aboriginal Australians than anywhere else in Australia, approximately 31% of the total urban New South Wales (NSW) Aboriginal population (ABS, 2011b, Biddle, 2012b). Western Sydney is classified as a disadvantaged area with high rates of unemployment and public housing and low educational attainment and incomes (Pawson and Davison, 2014, Randolph and Holloway, 2005). The majority of dwellings are detached houses, with some semi-detached houses and relatively few apartment blocks (ABS, 2011b).

2.7.2 Ethics

This study was approved by the AMSWS, the Aboriginal Health and Medical Research Council (686/09) and the University of New South Wales (10083). All data collected as

part of SEARCH are owned by the participating health service. Focus group participants were provided with participant information sheets and verbal explanation was given about the study purpose, the voluntary nature of participation, confidentiality procedures and how data would be recorded and used prior to consent forms being signed.

2.7.3 Study design

Focus groups were used to capture the breadth and richness of community views. They provide a culturally appropriate social space for building on ideas and discovering agreement or disagreement on a topic (Willis, Pearce et al., 2005). In this setting it is possible both to discover social norms and explore variation and complexity in views (Ritchie and Lewis, 2003).

2.7.4 Participant selection

Participants were purposively selected to include people of particular ages, genders, life stages, health and socioeconomic circumstances. After discussions with FV, CEO of the AMSWS, and other key members of staff, groups were formed based on the clinical services provided in order to recruit relevant groups while creating a degree of homogeneity to help participants feel comfortable. Staff and clients were invited to participate by the team leaders of each targeted service. Four groups were held:

- child and family (n = 12), 6 staff, 4 young mothers, 1 father and 1 grandmother
- chronic care (n = 9), 1 staff and 8 older men (2) and women (6) with chronic health issues
- social and emotional wellbeing (n = 11), 5 staff (4 male, 1 female) and 6 clients (4 female and 2 male, ages ranging from 20-60 years)
- staff (n = 11), 6 female, 4 male. Five staff had also attended the group relevant to their clinical speciality.

Thirty five of the thirty eight participants were Aboriginal. Participants had a range of levels of education and differed in terms of employment and housing status. The mix of staff and client participants in the groups occurred organically and reflects the relative

lack of division between these social groups in many Aboriginal communities, as compared with the distinction normally observed in mainstream health services.

2.7.5 Research process

Focus groups were facilitated by MA (female Caucasian PhD candidate with a health background) and PF (male Aboriginal researcher with a background in community-controlled health service provision) in late 2010. Three broad trigger questions were asked: Are Aboriginal people in Western Sydney having problems concerning housing? If so, what sorts of problems? What sort of effects are housing issues having on people? A conversational space was created where participants discussed housing issues of concern to them and facilitators probed for detail (Habibis, Taylor et al., 2016). Through this process additional domains were identified and explored. Groups ranged from 62 – 150 minutes in duration.

2.7.6 Analysis

Dialogue was recorded and transcribed verbatim. Transcripts were coded manually by MA using open coding techniques from a realist stance. AW conducted independent open coding on a transcript; the codes and thematic categories derived were very similar. Where minor conceptual differences arose, they were resolved through discussion. The codes were organised into a conceptual framework, with higher-level themes and an index of subthemes. PF reviewed these initial analyses. A community feedback session at the AMSWS was held in August of 2011 and attended by 4 Aboriginal focus group participants, 2 staff and 2 clients. Feedback was positive; some suggestions for additional inclusions and the prioritisation of certain themes over others were made, but no suggestions of omissions or misinterpretation.

Deeper analysis was then conducted using the Framework method, a case and theme-based approach to data management, in NVivo 10 (QSR International, 2010).

Framework matrices enabled clear visualisation of the data and facilitated analyses of associations between themes, and of the variation and agreement between and within focus group cases. COREQ guidelines for reporting qualitative studies have been

followed. Explanatory accounts have mostly been limited to the explicit reasons for phenomenon given by participants (Ritchie and Lewis, 2003).

2.8 Results

The majority of participants (20) lived in state-owned and managed public housing. Of these, nine were in mainstream public housing managed through Housing NSW. Eleven lived in state-owned and managed Indigenous housing (SOMIH), housing allocated exclusively to Aboriginal people through the Aboriginal Housing Office (AHO). Two lived in Aboriginal community housing owned by the local Aboriginal Land Council. Five participants lived in privately rented homes (4/5 were AMSWS staff, 1/5 a client). Four participants were homeless (2/4 staying with family or friends, 2/4 in emergency accommodation provided by the state), two participants had a mortgage (both staff, one Aboriginal and one non-Aboriginal). Five participants did not specify their housing situation. AMSWS staff participants were embedded in the community. Most lived locally, had experience of living in social housing themselves and regularly assisted their clients with housing issues. These experiences, combined with their health knowledge, made them key informants in this study. There was a high level of agreement between the views of AMSWS staff and clients, hence findings have been combined and presented thematically.

Five high-level themes were derived from the data: the battle to access housing; secondary homelessness; overcrowding; the poor condition of available housing; housing as a crucial determinant of health across the life course. Participants also discussed broader contextual issues surrounding housing problems, detailed in a separate paper.

2.8.1 The battle to access housing

Participants indicated that most Aboriginal people living in Sydney had limited housing options, with housing affordability described as a constant and pressing concern for many. Home ownership was described as unfeasible for most of the Aboriginal community and rarely discussed by participants. Sydney's private rental market was

also considered inaccessible to many Aboriginal people, particularly young people, due to prohibitive costs and/or their uncompetitive tenancy or work histories.

Discrimination from real estate agents and landlords was repeatedly described as another key barrier. Some participants recounted being falsely told there were no rental properties available, others submitted countless unsuccessful applications.

'to get a rental house – it's almost impossible for an Aboriginal person... there's proof of income, there's good tenancy records... you have got to compete with about 30 or 40 other people in all reality, except for black housing and subsidised NSW Housing, you wouldn't have a house, you just wouldn't have a house'

Middle-aged male AMSWS staff

Participants said social housing was the only option for much of the Aboriginal community. However, social housing was described as hard to access, with waiting periods of up to 15 years reported. Homes owned by the local Aboriginal Land Council were also said to be in short supply. This chronic shortage of affordable housing also meant people felt unable to insist that their housing met basic standards. Some also lived in housing that was inappropriate for their needs, for example frail aged people living up several flights of stairs.

'that's why they put up with sub-standard housing ... because they've got nowhere else to go.... when you're vulnerable, you get it and that's it. If you had money, you wouldn't be putting up with it'

Middle-aged female AMSWS staff

2.8.2 Secondary homelessness

While primary homelessness (rooflessness) was not described as common amongst Aboriginal people in Western Sydney, secondary homelessness (transient or emergency accommodation) was. Homelessness was mostly attributed to the long wait for social housing or forced evictions, often due to falling behind in rental payments. Participants said some people experiencing homelessness were eligible to stay in temporary state-provided accommodation, including low-cost motels, caravan parks or boarding houses. However, this was described as incredibly stressful, often involving frequent

moving between poorly located placements (no transport, services) that were often described as unsuitable for children,

'She can't take baby to the doctors, she can't go to the shops to get milk if she needs it. Some of the places that they're putting the Mums haven't got cooking facilities... she's got a young baby, and she can't even warm up a bottle of milk, and that's where a lot of them are'

Young female AMSWS staff

Participants reported that most Aboriginal people instead rely on their social networks to avoid primary homelessness, often living with family and friends for extended periods of time.

'One of the family members will get a house, and because we are very family-orientated, you won't leave family on the street, we'd all rather pack in'

Middle-aged female client

Participants said staying with others often entailed moving from house to house ('house-hopping'), sometimes with children in tow. One participant and her four children had been hopping for six years while awaiting social housing and applying unsuccessfully for private rental properties. Participants of both genders in all focus groups said this was common,

'A lot of our young Mums are like that. They have babies, they're house hopping... going from family to family to family. The babies aren't settled and the young mums aren't settled... it's just no good.'

Middle-aged female AMSWS staff

Participants said even families with stable employment and housing were not ensured good living conditions, as they may be called upon to share their housing with extended family and friends who would otherwise be homeless. Older participants were more likely to have housing but many had extended family either living or staying with them. Those hosting people reported feeling anxious their neighbours may complain about occupancy levels or noise and those in social housing were worried they may be charged higher rent or evicted for breaking tenancy agreements. Some hypothesised

that official measures of homelessness and overcrowding must underestimate the true scale of these problems, as many Aboriginal people are cautious about disclosing who lives with them for fear of these consequences.

2.8.3 Overcrowding

'Some of these families are living in overcrowded homes just beyond the ridiculous. Twenty people and more in a three bedroom place... because they just can't get housing'

Middle-aged female AMSWS staff

Participants reported that *'overcrowding is a big problem in a lot of the houses'*. The term *'overcrowding'* was spontaneously used by participants, not introduced by researchers. Several factors were believed to lead to overcrowding. Firstly, Aboriginal families are often large and there are insufficient affordable homes to appropriately accommodate them. Secondly, the community's efforts to accommodate homeless family and friends often resulted in multi-family households,

'my brother, he's living in a two bedroom and there's three families in there... they're sleeping on floors ... Having that many people in a two bedroom, it kills you, you know?'

Young male AMSWS staff

Thirdly, participants said Aboriginal people were often called upon to host extended family who were visiting to access services, visit family and friends or attend community events.

Participants described households struggling to cope with insufficient access to space, privacy and basic amenities,

'Imagine meal times, washing clothes, food preparation, all those things... we're forced to live in a communal situation... however, the facilities are not there to cater for that'

Middle-aged male AMSWS staff

Participants said significant numbers of Aboriginal children in Western Sydney lived in overcrowded housing; many without adequate space to sleep, play or do homework.

Overcrowded households were also described as interpersonally stressful environments, with people '*walking on eggshells to keep the peace*'. Participants believed overcrowding was inherently problematic, compounding other housing problems and a determinant of health in and of itself,

'If you've got a house that's overcrowded, there's a health issue. That's a health issue within itself. It's got nothing to do with the actual house'

Young female AMS staff

2.8.4 The poor condition of available housing

'All the houses here are inadequate, all the [state-owned public housing] homes are inadequate. Because they're that ancient, they don't get maintained properly...'

Middle-aged female AMSWS staff

Participants described the social housing in Western Sydney as generally old and in poor condition. They said the houses were often built from asbestos or other fibreboard, with poor insulation. Problems such as mould, damp, broken amenities, leaking rooves, structural problems, faulty plumbing and electrics, vermin infestation, and poor temperature control were reportedly common.

'I could sit here for months and listen to stories that would horrify anybody'

Older male AMSWS staff

With few exceptions, participants said public housing tenants experience difficulty obtaining repair and maintenance services. When maintenance or repairs were done, the quality of the work was reportedly often poor, '*just Band Aid jobs*'. Homes owned by the local Aboriginal Land Council were generally described as being in reasonable condition. However, some participants indicated that Land Councils also had insufficient funds to provide good maintenance services. Most participants who rented their homes privately said their housing was not of a particularly high standard, despite being expensive.

2.8.5 Housing a crucial determinant of health across the life course

'There are major, major health problems associated with that housing'

Older male AMSWS staff

Participants repeatedly expressed the belief that housing problems negatively affected the physical health and social and emotional wellbeing of the Aboriginal community in Western Sydney. Housing was said to affect the health of *'the whole community here'*, though some health issues and their sequelae were said to manifest in different ways across the life course.

In regard to physical health, participants believed a key driver for high rates of communicable disease (namely cold and flu, gastroenteritis, ear, chest and skin infections) in their community was overcrowding,

'In the overcrowded houses, if one of the kids gets sick the whole family gets sick'

Young female AMSWS staff

People associated mould and damp with the exacerbation of asthma and respiratory conditions. Injury risk posed by broken or faulty household fixtures was also a concern. Physical health problems were said to be of particular concern for children, the elderly and those with existing chronic health conditions.

In terms of social and emotional wellbeing, participants used words such as *'stressed'*, *'depressed'*, *'worried'*, *'frightened'* and *'terrified'* when describing housing problems. Housing was described as a pervasive source of stress affecting peoples' lives daily. Some said the physical condition of their housing contributed to feelings of depression. Others reported feeling *'hopelessness'*, powerless to change their housing situation or that of people close to them. People believed housing problems, particularly secondary homelessness and overcrowding, placed strain on couple and family relationships, which in turn affected individual emotional wellbeing.

'when you're living around twenty people, your stresses are up and the mental illness comes along quite quickly'

Young male AMSWS staff

Participants considered childhood a time of peak vulnerability for poor housing to affect health. They described pathways by which poor housing affected the life trajectories of many Aboriginal children in Western Sydney. They said children who are regularly sick have patchy school attendance. Otitis media was emphasised as a housing-related illness of particular concern due to its prevalence and potential effects on hearing, speech, language, behaviour and education. Inadequate playing spaces were said to limit social and developmental opportunities for some. Frequent relocation, particularly due to homelessness, was said to be unsettling for children and to cause further disruption to schooling. Participants considered the effects of poor housing on child health and development as a key mechanism in the maintenance of generational disadvantage,

*'How can your kids move on and build a life? And change or break that cycle?...
They're set up to fail from the beginning'* *Elderly female client*

Parents, especially young and sole parents, were another group for whom housing issues were said to cause significant health and wellbeing problems. Participants said they were disproportionately exposed to chronic and pervasive stress, particularly those unable to access stable housing,

'... and that is obviously impacting on [client's] emotional state, and her child, and that is having a great deal of impact on health. Not being able to get decent accommodation, worrying about it all the time'

Middle-aged female AMSWS staff

Participants said precarious housing was disempowering, making it more difficult for young parents to gain employment or complete higher education, in turn making it harder to secure decent housing. Secondary homelessness, house-hopping, overcrowding and even poor dwelling conditions were seen to make parenting difficult in multiple ways including the ability to: store and cook nutritious food; get children to school and medical appointments; provide consistent parenting (e.g. comfort or discipline); and keep children safe from various forms of harm, particularly in households where they were *'not the boss'*. These difficulties were said to heighten

stress and have further implications for child health. Staff expressed frustration that while recent health campaigns meant parents and carers were often knowledgeable about the value of healthy environments for their children, many were unable to control their home environment,

'I think that housing is one of the major issues for these families in keeping the children safe, having appropriate housing'

Middle-aged female AMSWS staff

Participants said living in crowded, stressful households sometimes meant older people were less able to attend to their own health needs. Older participants believed that both their current housing and poor housing during their childhood affected their health, particularly through the exacerbation of chronic illnesses now being experienced. They also expressed strong concern about the damage they believed poor housing was doing to the health of new generations of Aboriginal children,

'It's affected our health, and it's gonna affect our kids' health - you can see it now with our kids that have got kids, the problems they're having. We wonder what's going to happen to them and what's going to happen to their kids in housing?'

Elderly female client

Participants regarded the link between housing and health as common sense. They considered housing a crucial and under-resourced determinant of health,

'We are covering health, we are covering education... but it's housing that's just lagging far, far behind and until they address that one, you know, it's...' (holds up hands)

Middle aged female AMSWS staff

Participants asserted that while so many Aboriginal people experience the housing problems described, the health, education and employment gaps between Aboriginal and non-Aboriginal Australians would remain,

'Because housing affects the rest of your life... it's so important'

Middle-aged female AMSWS staff

(many say 'yeah')

2.9 Discussion

While this study is not the first to call attention to the unmet housing needs of urban Aboriginal Australians (Biddle, 2009b, 2012b, Birdsall-Jones and Corunna, 2008, Ware, 2013a), these findings add new insights into how Aboriginal people in this disadvantaged part of Sydney perceive their housing situations. Housing was described as a pivotal and far-reaching determinant of health for Aboriginal people in Western Sydney and a key mechanism for the maintenance of intergenerational disadvantage. Participants were particularly concerned about the poor living conditions of children and the impact they have on health and developmental trajectories. While young people and families were said to be most likely to experience difficulty securing appropriate housing, the burden of this difficulty was spread across the life course and to some extent also across the socioeconomic spectrum, as those with more secure housing were called upon to assist extended family and friends experiencing hardship.

The extreme difficulty participants experienced when trying to access housing is perhaps unsurprising given Sydney's current housing landscape. Housing NSW acknowledges 'a shortage of suitable accommodation for local communities in most areas' (Housing NSW). Expected waiting times for social housing in most Western Sydney suburbs were listed as '10+ years' for general applicants at the time of writing (NSW Government). A recent audit of available rental properties in Sydney, including outer Western Sydney, found that almost none were affordable for low income households (Kemp, Paleologos et al., 2014). In the current study, difficulty accessing suitable housing was reported to be exacerbated for Aboriginal people due to discrimination from private housing providers. Evidence of racial profiling affecting housing opportunities has been found in Australia and overseas (Equal Opportunity Commission, 2011, Memmott, Chambers et al., 2005, Nelson, MacDonald et al., 2015, Turner, Santos et al., 2013).

Participants spoke emphatically about the health and social problems they associated with 'overcrowding'. This is a noteworthy finding as the notion of overcrowding is controversial. Some suggest that the term 'overcrowding' is inappropriately laden with negative meaning as Aboriginal people may have a cultural preference for living in extended family households (Biddle, 2011b, Memmott, Long et al., 2004, Shelter SA, 2014). High household occupancy has even been associated with better emotional wellbeing in Aboriginal children in some remote communities (Silburn, Zubrick et al., 2006). However, participants in this study expressed a clear preference for living near but not with extended family, particularly as available housing is not designed for multi-family households. High household occupancy was considered inherently problematic, negatively affecting people's health and wellbeing. This view is in keeping with research, overseas and in remote Australia, that demonstrates significant associations between high household occupancy and health problems, particularly infectious disease (Baker, McNicholas et al., 2000, Jacoby, Carville et al., 2011, Shaw, 2004). Participants felt the combination of housing unaffordability, homelessness and kinship obligations were the main drivers for overcrowding in Aboriginal households, a relationship which has been documented elsewhere (Birdsall-Jones, Corunna et al., 2010). Both the value of such social capital (Browne-Yung, Ziersch et al., 2013) as protection against rooflessness and the high cost paid by hosts in crowded households have been noted previously (Birdsall-Jones, Corunna et al., 2010).

The poor condition of the ageing social housing stock in New South Wales is also widely acknowledged, as are the maintenance affordability problems this poses for housing providers (Jacobs K, Atkinson R et al., 2010, Kenley, Chiazor et al., 2010). Poor public housing conditions and difficulty getting required maintenance performed has also been reported in other urban parts of Australia (Birdsall-Jones and Corunna, 2008, Mallett, Bentley et al., 2011). Another finding of note is that participants in this study invariably expressed the wish to obtain stable housing. They believed a key driver of homelessness for Aboriginal people in Western Sydney was the lack of accessible, affordable housing. This differs from the situation in remote communities, where it has been suggested that homelessness is driven by factors beyond inadequate housing

supply such as the need for mobility to access services and significant places and cultural or personal factors (Memmott, Long et al., 2004).

A deep and broad knowledge of environmental health was evident in participants' discussion of housing. Many of the specific links participants posited between housing and health echo existing epidemiological research findings (Shaw, 2004, Ware, 2013a, WHO, 2006). Household crowding is associated with infectious disease, including otitis media (Jacoby, Carville et al., 2011). Otitis media in turn is associated with hearing loss, speech and language problems in children (Winskel, 2006). Damp and mouldy houses are independently associated with asthma, other acute and chronic respiratory conditions, depression, anxiety and recurrent headaches (Keall, Crane et al., 2012, Shorter, Crane et al., 2017). Poor dwelling conditions also increase injury risk, particularly for children and the elderly (Keall, Baker et al., 2008). Unstable housing tenure, particularly homelessness, has been shown to negatively affect physical and mental health, child development, and social and economic participation (Dockery, Kendall et al., 2010). Moreover, the kind of chronic, pervasive stress participants described experiencing due to housing problems has been described as in the literature as 'toxic' (Shonkoff, Garner et al., 2012). Such pervasive stress in childhood is associated with lasting health effects, including chronic disease and mental ill health (Miller, Chen et al., 2011). Similarly, the kind of racism participants described experiencing is associated with psychological distress, mental ill health and poor physical health (Larson, Marisa et al., 2007, Paradies, 2016, Priest, Paradies et al., 2011, Taylor, Williams et al., 2007, Ziersch, Gallaher et al., 2011). Study participants also identified that children, young families, the elderly, those living in poverty and those with existing health conditions are most vulnerable to housing problems; that is they are most likely to experience housing problems and are most susceptible to the ill effects of poor housing (Curtis, Corman et al., 2010, Dockery, Kendall et al., 2010, Mallett, Bentley et al., 2011, Marsh, Gordon et al., 2000, Oswald, Wahl H et al., 2007, Swanson-Ernst, Meyer et al., 2004).

The detailed information given by participants and their ability to address current knowledge gaps or areas of controversy in the literature highlights the value of working with Aboriginal communities to identify problems, potential causal pathways and ultimately solutions to the sorts of complex problems with which they are intimately familiar. Their lived experiences unsurprisingly renders them experts in Aboriginal affairs (Anderson, 2010). Participants in this study expressed a holistic view of health, considering health to be intrinsically linked with environmental and social factors. The compatibility between Aboriginal conceptualisations of health and the social determinants of health has been noted elsewhere (National Aboriginal Health Strategy Working Party, 1989), as have the ethical, moral and practical imperatives of listening to Aboriginal voices (Anderson, 2010, Habibis, Taylor et al., 2016). Qualitative research methods offer a particularly appropriate means of exploring and communicating Aboriginal knowledge and world views (Habibis, Taylor et al., 2016).

Participants of this study were unanimous in believing that if Australia is serious about 'closing the gap', more investment in Aboriginal housing, including urban public housing, is required. While federal and state governments have established a National Partnership Agreement on Remote Indigenous Housing and committed billions of dollars to improve remote housing (McDonald, 2011), there is no comparable agreement on urban Indigenous housing. Instead the housing needs of urban Aboriginal people are addressed under mainstream social housing and homelessness agreements (Milligan, Phillips et al., 2011b). Study participants expressed the belief that housing problems in the Aboriginal community went beyond those experienced by other low income groups. Many additional systematic factors were said to affect housing prospects and conditions for Aboriginal people, including discrimination and cultural responsibilities to extended family. Along with the participants of this study, academic Nicholas Biddle warns that the closing the gap campaign will not be successful unless the issues facing city-dwelling Aboriginal people are specifically addressed,

'To close the gaps, all levels of government will have to have one eye on remote Australia with the other on indigenous gaps in the cities' (Biddle, 2009b).

While housing may seem beyond the scope of the health sector, there is a long-standing relationship between public health and housing (Krieger and Higgins, 2002). Public health professionals have an obvious role to play in describing the scale and health impacts of housing problems. Public health can also engage in a range of other activities to improve housing conditions, including advocacy and awareness raising, collaboration with the housing sector, the provision of direct services and evaluation of the effectiveness of housing improvement programs. For example, New South Wales Health (NSWH) have long conducted 'Housing for Health', a housing intervention designed to improve aspects of housing known to affect health, chiefly for households in Aboriginal community-controlled housing in rural and remote areas (NSW Department of Health, 2010). Amongst other benefits, residents of households who received Housing for Health had 40% lower rates of hospital separation for infectious diseases than comparable rural and remote Aboriginal communities who did not receive the program (NSW Department of Health, 2010). Housing for Health was recently piloted with 44 Aboriginal households living in state-owned social housing in Western Sydney (Auld, Noonan et al., 2015). This involved a unique collaboration between the Western Sydney Public Health Unit, NSW Health Aboriginal Environmental Health Unit, Housing NSW, the NSW Land and Housing Corporation and the AMSWS (Auld, Noonan et al., 2015). This cross-sectoral collaboration, which was assisted by SEARCH researchers, took many years and much determination from the Western Sydney Public Health Unit and good will from all parties to negotiate, but may provide a viable model for the ongoing improvement of existing social housing conditions for urban Aboriginal households.

In New Zealand, a public health research group has produced a large body of high quality evidence demonstrating the relationships between housing and health and the cost-effectiveness of investment in housing improvement programs (Grimes, Denne et al., 2012, Howden-Chapman, Matheson et al., 2007, Howden-Chapman, Pierse et al., 2008). This evidence has been successfully used to lobby the government to fund widespread housing improvement programs and to influence public discourse about the importance of social housing stock as a key part of the nation's infrastructure

(Grimes, Denne et al., 2012, Howden-Chapman, 2012). This group has also developed an evidence-based, standardised housing assessment for use to determine if housing meets basic health, safety and energy efficiency standards (Gillespie-Bennett, Keall et al., 2013). Trials are underway to test the feasibility of making the obtainment of this 'Warrant of Fitness' compulsory for homes leased in the private sector. The current study reports the views of clients and staff of the Aboriginal Medical Service Western Sydney. They are not necessarily reflective of the views of other Aboriginal people in Sydney or elsewhere. This study reports the housing and health issues that study participants were aware of and concerned about. It is not intended to comprehensively capture all potential pathways by which housing conditions may be materially affecting health and wellbeing. It may be useful to conduct focus groups with urban Aboriginal people who own or are paying off their own homes or those who are sleeping rough, as these groups may have a different range of housing experiences and perspectives.

2.10 Conclusion

This study has several implications. Housing appears to be a major issue for urban Aboriginal people, meriting targeted research and policy attention. Further inquiry into urban housing conditions and their health association is also indicated. These findings will inform quantitative research to be conducted by the study team. At an individual level, health professionals and educators working in urban settings should consider discussing housing with Aboriginal clients as part of holistic service provision. More broadly, public health has played an important role in advocating for improved housing in remote Aboriginal communities. A similar public health approach to housing may also benefit the many Aboriginal Australians living in our cities and suburbs.

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CHAPTER 3: *STUDY TWO*, URBAN ABORIGINAL PERSPECTIVES ABOUT THE REASONS FOR HOUSING DISADVANTAGE

3.1 Preamble

Chapter 2 presented the findings of focus groups conducted with Aboriginal people in Western Sydney, where a range of housing problems were described as common and inextricably linked to health and wellbeing. But much of what participants also discussed during these groups related to the housing disparity they saw between Aboriginal and non-Aboriginal people and their beliefs about how and why this disparity exists. This information also merits analysis as it informs conversations about how to improve the housing situations of disadvantaged Aboriginal people in urban areas.

The data presented in **Chapter 3** are novel and the analysis extends the discussion of urban Aboriginal housing disadvantage beyond the descriptions of housing problems outlined in **Chapter 2**. No research to date has examined how non-homeless urban Aboriginal people explain and conceptualise the housing disparity they experience, or what impact they perceive social and systems-level factors to have. The study presented in **Chapter 3** documents and examines urban Aboriginal people's views about how and why so many Aboriginal people continue to experience housing disadvantage in Australia's cities and towns.

3.2 Copyright statement

I certify that this publication was a direct result of my research towards this PhD, and that reproduction in this thesis does not breach copyright regulations.

Andersen, M., Williamson, A., Fernando, P., Eades, S. and Redman, S. (accepted 2017). "They took the land, now we're fighting for a house': Aboriginal Perspectives about Urban Housing Disadvantage.' *Housing Studies*.

Signed

A handwritten signature in black ink, appearing to be 'Melanie Andersen', with a long horizontal stroke extending to the right.

Melanie Andersen

September 2017

3.3 Study Two, 'They took the land, now we're fighting for a house':

Aboriginal Perspectives about Urban Housing Disadvantage.

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Study Two has been published in *Housing Studies* (Andersen, Williamson et al., 2017a)

3.4 Author contributions

Study conception and design: **MA**; AW; PF; SR; SE. Acquisition of data: **MA**; PF. Data analysis: **MA**; AW; PF. Interpretation of data: **MA**; AW; PF; SE; SR. Writing of manuscript: **MA**. All authors read and gave critical feedback on the manuscript and approved the final manuscript.

3.5 Abstract

Aboriginal Australians experience substantial housing disadvantage on a range of measures, yet relatively little is known about how urban Aboriginal people perceive their housing circumstances. While most Aboriginal people live in urban or suburban areas, research and policy attention has tended to focus on remote housing issues. This paper draws on focus groups conducted with Aboriginal people at an Aboriginal Medical Service in Western Sydney (n=38) about their housing experiences and beliefs about why many Aboriginal people experience the housing disadvantage they described. Participants described a landscape in which their housing experiences were materially affected by their Aboriginality and inextricably linked to racial discrimination, poverty, marginalisation, the lack of social and affordable housing and disempowerment, all with negative implications for their psychosocial wellbeing. Participant views aligned with critical race theory, with race described as a fundamental structural force that created and deepened housing disadvantage beyond economic hardship alone.

3.6 Introduction

The housing situations of Aboriginal and Torres Strait Islander (hereafter Aboriginal) Australians differ markedly from those of non-Aboriginal Australians. Aboriginal Australians are four times more likely to live in social housing (Milligan, Phillips et al., 2011b, Ware, 2013b), four times more likely to experience crowded living conditions (Biddle, 2011b, 2012b), three times more likely to live in derelict dwellings (Baker, Lester et al., 2016), fourteen times more likely to experience homelessness than the general population (AIHW, 2014a) and half as likely to own a home (Biddle, 2011b). Poor housing is cited as a key determinant of the health disparity experienced by Aboriginal Australians (AIHW, 2014c, Bailie, Stevens et al., 2010), as is the case for Indigenous peoples elsewhere (Anderson and Collins, 2014, Webster, 2015).

Aboriginal people are also disproportionately exposed to many other forms of disadvantage. They live, on average, a decade less than other Australians and experience significantly higher rates of chronic disease, poverty, unemployment and have lower rates of educational attainment (AIHW, 2015, Biddle, 2010, Helme and Lamb, 2011). These disparities are particularly large in Australia but are otherwise similar to those experienced by indigenous peoples in other wealthy nations with histories of colonisation and dispossession, including Canada, New Zealand and the United States of America (Anderson and Collins, 2014, Equal Opportunity Commission, 2011).

Housing circumstances are known to affect health, education, employment and child development outcomes (Baker, Lester et al., 2016, Biddle, 2007, Dockery, Kendall et al., 2010, Thomson, Thomas et al., 2013). Improved housing is a key pillar of the 'Closing the Gap' campaign, a collaborative initiative of federal and state governments that aims to reduce the disparities between Aboriginal and non-Aboriginal Australians (Council of Australian Governments, 2009). Research on the links between Aboriginal housing and wellbeing has largely focused on physical health outcomes like infectious disease (Bailie, Stevens et al., 2010) and conceptualisations of how specific housing factors such as crowding relate to psychological stress (Memmott, Birdsall-Jones et al., 2012) and

Chapter 3: *Study Two*, Urban Aboriginal perspectives about housing disadvantage has almost exclusively been conducted in remote communities (Andersen, Williamson et al., 2016).

While the majority of Aboriginal people live in major cities and large regional centres (AIHW, 2011), relatively little research has been conducted into urban Aboriginal housing disadvantage, its consequences and causes (Birdsall-Jones and Corunna, 2008, Memmott, Chambers et al., 2005, Milligan, Phillips et al., 2011b). Anderson and Collins (2014) conducted a scoping review of literature about the prevalence and causes of urban Indigenous homelessness – the most extreme form of housing disadvantage – in Canada, New Zealand and Australia. They identified a ‘limited’ body of literature examining causal factors that explained how and why Indigenous people were more likely to be homeless. Most factors named were structural, including the fraught, unequal relationships between settler states and Indigenous peoples, racial discrimination, different cultural perceptions about housing and mobility, poverty, violence, abuse and interaction with the child welfare system. ‘General social indicators’ such as differences in education, employment and health status were also often linked to Indigenous homelessness in the literature, though Anderson and Collins highlighted that these are general risk factors for homelessness and do not help explain why Indigenous peoples are consistently more likely to experience homelessness than non-Indigenous people.

Much of the Australian research on housing disadvantage has centred on Aboriginal peoples’ housing careers and experiences of housing service provision, though many insights can be gleaned from this work about the underlying drivers of housing disparity, including but not limited to poverty, discrimination, the inadequate supply of social and affordable housing and the cultural disconnect between social housing services and Aboriginal tenants resulting in difficulties accessing and maintaining tenancies (Cooper and Morris, 2005, Flatau, Cooper et al., 2005, Habibis, 2013, Memmott, Chambers et al., 2005, Milligan, Phillips et al., 2011b, Moran, Memmott et al., 2016).

Theories about how and why disadvantage exist are important in that they frame discussion about how to create change. The opening statement of the 2015 Closing the Gap report by then Prime Minister Abbott read, 'It's hard to be literate and numerate without attending school; it's hard to find work without a basic education; and it's hard to live well without a job' (Commonwealth of Australia, 2015, p. 1). While the value of education in reducing Aboriginal disadvantage is undisputed, as noted by Walter (2016) this statement shifts the focus away from the role of the state in the disruption of social patterns of disparity towards one of blame for individual failures. Discourses of individual responsibility associated with neoliberal paradigms are common in Australia; the relative importance of social structure versus individual agency is the subject of debate in mainstream politics, and to some extent within the Aboriginal community, as is the role of the state in achieving social change (Pearson, 2011, Sanders, 2009). Aboriginal perspectives on the reasons for disparity offer vital insights based on lived experiences, understandings and value systems that can be quite different to those of the dominant white settler culture (Habibis, Taylor et al., 2016).

This paper arose from focus groups conducted with Aboriginal people in Western Sydney about their housing experiences and their views on the relationships between housing and health. Those findings related to the direct impact of poor housing on health have been published elsewhere; in brief, housing problems - including difficulty accessing housing, crowding, unaffordability, instability and poor dwelling conditions - were described as prevalent and said to have a substantial negative impact on the health and wellbeing of Aboriginal people in Sydney (Andersen, Williamson et al., 2016). However, it became apparent during analysis that a significant and central component of what participants disclosed related to their beliefs about the underlying causes of the housing disadvantage so prevalent in their communities. Participants discussed the key role of race relations in shaping Aboriginal peoples' housing opportunities and experiences, along with the impact of racism and other structural social forces on both individual and collective psychosocial wellbeing, traversing broader terrain than existing research about links between Aboriginal housing and health. This is significant because Aboriginal definitions of health encompass 'not just the physical well-being of an individual but refers to the social, emotional and cultural

Chapter 3: *Study Two*, Urban Aboriginal perspectives about housing disadvantage well-being of the whole Community in which each individual is able to achieve their full potential as a human being, thereby bringing about the total well-being of their Community'(AH&MRC Website).

The explanatory framework participants proffered fit within the realm of critical race theory, which highlights the mechanisms of power that create and maintain racial disparity (Haynes Writer, 2008). Critical race theory has origins in legal studies and is concerned with the forces that maintain white privilege, many of which it argues are invisible, socially normalised processes and structures (Banivanua-Mar, 2007, p. 57). While it originated from attempts to explain how white dominance remained in America despite the many apparent achievements of the civil rights movement, critical race theory has many useful parallels in countries like Australia, where oppressive forces are no longer necessarily explicit acts 'committed by bad people, bad laws or bad states who actively engage in oppressive or discriminatory behaviour' (Banivanua-Mar, 2007). Indeed, Australian Aboriginal people have had equal citizenship rights since 1967 (Dutton, 2002), laws exist to prevent overt racial discrimination, the state funds many programs that attempt to reduce Aboriginal disadvantage and many Aboriginal organisations provide effective front-line services and advocacy, yet a wide gulf persists on many fronts; in some areas, such as criminal justice, the gap is widening (Commonwealth of Australia, 2017). Critical race theory highlights the less visible and sometimes unconscious forces at play in the continuity of privilege and oppression, including the default preferencing of white norms and values, the role of law and policy as instruments of white domination and how dominance is reinforced through everyday interactions, particularly with state and other institutions (Habibis, Taylor et al., 2016). As highlighted by Haynes-Writer (2008), one of the ways critical race theory aims to disrupt these patterns is by provoking a 'cognitive conflict to jar white dysconscious racism' (Ladson-Billings, 1998, p. 16), that is, to enable white people to 'grasp what it is like to be nonwhite' (Delgado & Stefancic, 2001, p. 39).

The purpose of this paper is to give voice to participants' views by answering the questions: what explanatory frameworks do urban Aboriginal people have for the housing disadvantage they experience? How do they make sense of and feel about

their experiences in Sydney's housing market? We take a realist perspective and employ an inductive approach in order to privilege the voices of Aboriginal participants about their lived experiences. Scholars have previously drawn on critical race theory to help explore Aboriginal disadvantage, including housing disadvantage in Australia (Habibis and Walter, 2015); hence, this study does not necessarily break new theoretical ground. Rather, it continues this conversation and extends it by adding urban Aboriginal perspectives about the impact of race and other structural social forces on housing disadvantage and on individual and collective psychosocial wellbeing. Participants also gave their views on recent changes to the management of urban social housing services and what arrangements might work best. We relate our analysis to existing knowledge about Aboriginal housing disadvantage and discuss the implications for the housing sector in urban Australia and beyond.

3.7 Methods

3.7.1 Setting

This research took place at the Aboriginal Medical Service Western Sydney (AMSWS), an Aboriginal community-controlled health service (ACCHS) in Mt Druitt in the Blacktown Local Government Area of Sydney, in New South Wales (NSW), Australia. Since this research was conducted, the AMSWS was closed by the government and services are now being provided by another ACCHS. The name Blacktown reflects the colonial history of the area, so-named because of the institutions established there in the 1890s to assimilate Aboriginal people from a range of cultural and language groups into European culture (Brook and Kohen, 1991). This residential area, 40km west of the Sydney Central Business District, is home to more Aboriginal Australians than anywhere else, approximately 31% of the urban NSW Aboriginal population and 12% of the total Aboriginal population in NSW (ABS, 2011b, Biddle, 2012b). Despite this, the Aboriginal population in the Blacktown area is geographically dispersed and Aboriginal people remain a minority group in these neighbourhoods (ABS, 2011b, Osborne, Baum et al., 2013).

Blacktown is considered a disadvantaged part of Sydney, with higher rates of unemployment and public housing and lower educational attainment and incomes

Chapter 3: *Study Two*, Urban Aboriginal perspectives about housing disadvantage (Pawson and Davison, 2014, Randolph and Holloway, 2005). The majority of dwellings are detached houses, with some semi-detached houses and relatively few apartment blocks (ABS, 2011b). Declining housing affordability is a major issue in Sydney (Mason, Baker et al., 2013). Recent audits of available rental properties in Sydney (including outer Western Sydney) found that virtually none were affordable for low income households (Kemp, Paleologos et al., 2014, Ting, 2015). There were only five outer suburbs of Sydney (0.1%) where a person working full time on minimum wage can afford to rent a one bedroom apartment, none of which were in the Blacktown area (Ting, 2015).

3.7.2 Ethics

Ethics approval was obtained from the Aboriginal Health and Medical Research Council (686/09) and the University of New South Wales (10083). Focus group participants were provided with participant information sheets and verbal explanation was given as to the study purpose, the voluntary nature of participation, confidentiality procedures and how data would be recorded and used prior to consent forms being signed.

3.7.3 Study design

Focus groups were used to capture breadth and richness in community views. Focus groups provide a culturally appropriate social space for Aboriginal participants to build on ideas and test agreement or disagreement on a topic (Willis, Pearce et al., 2005). In this setting it is possible both to discover social norms and explore variation and complexity in views (Ritchie and Lewis, 2003).

3.7.4 Participants

Participants for each group were purposively selected to include people of particular ages, genders, life stages, health and socioeconomic circumstances. The CEO of the AMSWS recommended forming groups based around the clinical services provided in order to recruit relevant groups while creating a degree of homogeneity to help participants feel comfortable. Staff and clients were invited to participate by the team leaders of each targeted service to ensure compliance with ethics requirements that

potential participants not be directly approached by researchers. Four groups were held:

- child and family (n = 12), 6 staff, 4 young mothers, 1 father and 1 grandmother
- chronic care (n = 9), 1 staff and 8 older men (2) and women (6) with chronic health issues
- social and emotional wellbeing (n = 11), 5 staff (4 male, 1 female) and 6 clients (4 female and 2 male, ages ranging from 20-60 years old)
- staff only (n = 11), 6 female, 4 male. Five staff also attended a group relevant to their clinical speciality.

Thirty five of the thirty-eight participants were Aboriginal. The majority (20) lived in state-owned and managed public housing. Of these, nine were in mainstream public housing, managed by Housing NSW, the state housing authority (SHA). Eleven lived in state housing allocated exclusively to Aboriginal people, owned by the state Aboriginal Housing Office (AHO) but managed by Housing NSW (Milligan, Phillips et al., 2011b). Two lived in housing owned by the local Aboriginal Land Council, an Indigenous Community Housing Organisation (ICHO). Five participants lived in privately rented homes (4/5 were AMSWS staff, 1/5 a client). Four participants were homeless (2/4 staying with family or friends, 2/4 in emergency accommodation provided by the state), two participants had a mortgage (both staff). Five participants did not specify their housing situation. The low number of study participants in home ownership would suggest a relatively disadvantaged sample population. Participants had a range of levels of education and differed in terms of employment status and housing situation.

Staff participation in client groups occurred organically, as staff who helped recruit participants were interested in being involved in the groups. This mix could, in some situations, be considered problematic given the potential for power discrepancies to influence participant discussion. This would obviously be a conflict if the topic of research was health care provision; however, this was unlikely in this study given that AMSWS staff were not responsible for housing provision for clients and thus client comments about housing had no bearing on them professionally. Moreover, our experience was that these staff helped create a safe, supportive space in which clients

could feel comfortable telling their stories, which were personal and at times painful, to unfamiliar researchers. We also noted a relative lack of division between these social groups in terms of their housing histories and close personal dealings with housing disadvantage, which was somewhat surprising given the differences in employment status between staff and many clients. Several AMSWS staff participants either currently or previously lived in social housing and all reported regularly assisting their clients with housing issues. Most staff lived locally, were deeply embedded in the community and had family and friends experiencing housing difficulties. Thus, they were key informants in this study.

3.7.5 Research process

Four focus groups were facilitated by MA (female Caucasian PhD candidate with a health background) and PF (male Aboriginal researcher with a background in community-controlled health service provision) in late 2010. Three broad trigger questions were asked: Are Aboriginal people in Western Sydney having problems concerning housing? If so, what sorts of problems? What sort of effects are housing issues having on people? Participants raised and discussed issues related to their housing. The broad interview schedule allowed facilitators to follow lines of discussion raised by participants and probe for detail. Through this process, additional domains beyond the trigger questions were explored, many of which formed the themes in this paper, including why are so many urban Aboriginal people are experiencing housing problems? Groups ranged from 62 – 150 minutes in duration.

3.7.6 Analysis

Dialogue was recorded and transcribed verbatim. Transcripts were coded manually by MA using open coding techniques. AW conducted independent open coding on a transcript; the codes and thematic categories derived were very similar. Where minor conceptual differences arose, they were resolved through discussion. The codes were organised into a conceptual framework, with higher level themes and an index of subthemes. PF reviewed these initial analyses. A community feedback session at the AMSWS was held in August of 2011, facilitated by MA and PF and attended by four Aboriginal focus group participants, two staff and two clients. Feedback was positive;

some suggestions for additional inclusions and the prioritisation of certain themes over others were made, but no suggestions for omissions or misinterpretation.

Deeper analysis was then conducted using the Framework method, a case and theme-based approach to data management (Gale, Heath et al., 2013), in NVivo 10 (QSR International, 2012). Framework matrices enabled clear visualisation of the data and facilitated analyses of associations between themes, and of the variation and agreement between and within focus group cases. There was a high level of agreement across the groups and between AMSWS staff and clients; hence, findings have been combined and presented thematically. Explanatory accounts have mostly been limited to the explicit reasons for phenomenon given by participants.

3.8 Results and discussion

Participants described significant difficulty accessing housing in Western Sydney. Housing instability and hidden homelessness were described as commonplace, as were overcrowding and poor dwelling conditions (Andersen, Williamson et al., 2016). The current study focuses on participant discussion about the factors they believed drove these and other housing problems. Five high-level themes were derived from this data: racism; poverty; neighbourhood marginalisation; an insufficient government response; and disempowerment. These findings are not only about housing, but also about participants' experiences of being Aboriginal in Australia's largest city, where they perceived their opportunities to be strongly and adversely affected by their Aboriginality

3.8.1 Racism and social exclusion

Racial discrimination was said to have a profound effect on the housing experiences of Aboriginal people in Western Sydney. The racism described was sometimes overt and explicit and sometimes more subtle, indirect or inadvertent, including institutionalised racism (Berman and Paradies, 2008, Jones, 2002).

Many participants reported experiencing discrimination when attempting to obtain housing, particularly when applying for rental properties through private real estate

agents. This was said to be particularly the case for those who 'look black' or were most readily identifiable as Aboriginal. Participants said racism could be exemplified by falsely being told there were no properties available, or submitting high numbers of applications with no success. Several participants reported being discriminated against on the basis of their Aboriginality despite their good income and work history,

'I went to rent a house in town. Me and my husband are both working, on big wages. We went in, 'Oh no, they're all gone'. So I went to see a mate of mine, she's on the pension and she's white... and I said, 'Can you go and see this real estate?' and they said, 'Oh when did you want to move in?'. And she's on a pension!' (Middle-aged female staff)

These reports of racism in Sydney's private housing market echo those in studies in other parts of Australia (Equal Opportunity Commission, 2011, Gallaher, Ziersch et al., 2009, Milligan, Phillips et al., 2011b) and the high prevalence of racism reported more broadly by both Aboriginal and non-Aboriginal Australians (Berman and Paradies, 2008, Beyond Blue, 2016, Ziersch, Gallaher et al., 2011). There is strong evidence that race can materially affect access to housing and that whiteness is associated with preferential treatment in Australia and overseas. For example, large 'mystery shopper' studies in America found that while overt discrimination was rarely displayed, real estate agents informed African American applicants of significantly fewer properties than their Caucasian counterparts (Turner, Santos et al., 2013). Moreover, participants from minority groups whose non-Caucasian ethnicity was more readily identifiable experienced more discrimination than those who could be mistaken as white, a finding that accords with reports by participants in the current study. Similar research in the Sydney housing market likewise found that white renters received preferential treatment by real estate agents compared to renters from ethnic minority groups (Indian and Muslim Middle Eastern) even though all were well educated and spoke clear English; these differences were measurable and statistically significant (Macdonald, Nelson et al., 2016).

Participants attributed much of the racism they experienced in the housing market to a pervasive negative stereotype that Aboriginal people make bad tenants,

'There seems to be this generalisation that they're going to trash the homes...that's why they get knocked back all the time, they're never a chance.'

(Middle-aged female staff)

In addition to presenting a barrier to accessing housing, once housed, participants also reported racism from some non-Aboriginal neighbours. Several groups spoke of Aboriginal tenants whose neighbours launched organised campaigns against them to their landlords. On occasion this was said to contribute to a household's eviction.

'They're good at doing petitions, good at getting support, and the Aboriginal people have got to suffer from that, you know? And I've seen that happen a lot.'

(Elderly male client)

Some described feeling simultaneously '*invisible*' and intrusively monitored by non-Aboriginal neighbours, particularly when family and friends visit.

'My daughter lives in a townhouse. Now on a daily basis, from my observation, she's invisible to the rest of the [neighbours], but as soon as family starts coming there, they say, 'Hey, look at all these fellas!' [others nod and say 'yeah'] ... It affects us. So I have to say to my family, 'Don't go there too much' because it's bad for her' (Elderly female client)

There are parallels to be drawn between some participants' expressed sense of invisibility at an individual level and the higher-level invisibility of the unmet housing needs of many Aboriginal people living in urban areas. As with many other issues, urban Aboriginal housing has historically attracted significantly less media, research and targeted policy attention than remote housing (Biddle, 2009b, Eades, Taylor et al., 2010, Osborne, Baum et al., 2013). While federal and state governments have established a National Partnership Agreement on Remote Indigenous Housing and committed \$5.5 billion dollars over ten years to improve remote housing, there is no comparable agreement on urban Indigenous housing (McDonald, 2011).

There are several potential explanations for this, including geographical dispersement of the urban Aboriginal population and the misguided mythology that Aboriginal

people who live in urban areas have no legitimate Aboriginal identity or culture (Behrendt, 2005, Browne-Yung, Ziersch et al., 2013, Osborne, Baum et al., 2013, Scrimgeour and Scrimgeour, 2008). Some of the housing problems in remote communities are particularly acute and visually shocking, but larger absolute numbers of Aboriginal Australians affected by housing disadvantage live in urban areas (Osborne, Baum et al., 2013). For instance, while severe overcrowding is more prevalent in remote communities, the majority of overcrowded Aboriginal households are located in urban areas and unaffordability is more prevalent for city-dwellers (Biddle, 2012b). It is also possible that non-Aboriginal people turn a 'blind eye' due to racist beliefs, ambivalence, shame (Farrelly, 2009) or predominant narratives of individual merit as legitimate mediators to scarce resources in competitive markets (Banivanua-Mar, 2007).

The receipt of racial discrimination was described as distressing and humiliating. In addition to materially affecting housing prospects, it was said to have a cumulative, harmful impact on people's wellbeing. The language participants used to describe their experiences of discrimination evoked images of physical violence. Phrases such as '*it's a kick in the guts*', being '*knocked back*' or '*knocked right down*' appeared frequently through the transcripts. This phenomenon, which has been noted elsewhere, is likely to have physiological foundations (Macdonald and Leary, 2005). Neuroimaging studies have demonstrated that social exclusion activates the same regions of the brain activated by physical pain (Cristofori, Moretti et al., 2013, Eisenberger, Lieberman et al., 2003). Moreover, consistent with the views of participants in the current study, racism - and even the anticipation of racism - has been shown to negatively affect a range of health outcomes, including cardiovascular health and cancer, in addition to more widely known impacts on social and emotional wellbeing (Beyond Blue, 2016, Brondolo, Love et al., 2011, Larson, Marisa et al., 2007, Paradies, Harris et al., 2008, Pascoe and Richman, 2009, Priest, Paradies et al., 2012, Taylor, Williams et al., 2007, Ziersch, Gallaher et al., 2011). It is also possible that one of the pathways by which racism may affect health is through the sort of housing exclusion participants described, although in one study examining potential links between reported racism, housing conditions and child illness in remote Aboriginal communities no significant associations were found (Priest, Paradies et al., 2012).

3.8.2 Poverty

Entrenched poverty was one of the key drivers of housing disadvantage for urban Aboriginal people. Participants said many Aboriginal people in Western Sydney live on low wages or government benefits, and that poverty caused obvious and significant problems with housing access and affordability. The ramifications of poverty affected even the pragmatics of searching for housing, as many were without access to the Internet to identify suitable properties, a car to travel to view or apply for properties and some lived in areas with poor public transport. Participants were acutely aware of increasing private rental prices in Sydney, including in the Blacktown area. Many Aboriginal people were either absolutely excluded from the market due to high costs or effectively excluded due to an inability to compete with other applicants earning higher incomes,

'These days, if you don't have a high-paying job, there's no way you are going to private rent' (Middle-aged female staff)

Inability to pay the rent, both in private and public housing, was a common reason for forced eviction, homelessness and crowding amongst the Aboriginal community in Western Sydney. While participants said those Aboriginal people who were well educated, employed and financially secure were generally able to obtain suitable housing in the private sector, participants stressed that given the high levels of disadvantage in the Aboriginal community this situation was not the norm. Indeed, employment did not guarantee secure or adequate housing and even those with secure housing were reported to experience problems such as overcrowding when hosting extended family who were experiencing hardship, a situation which is arguably less common amongst white families (Andersen, Williamson et al., 2016).

'My brother, he's living in a two bedroom and there's three families in there. And he doesn't have any other option, and he's going to work and he's trying... but they can't go back to Housing because they've got a bill.' (Young male staff)

This is an important finding both empirically and theoretically, illustrating the role of race in influencing housing security. The obvious role of income in mediating access to housing, the largest single expenditure item for most households and particularly for

low income Aboriginal households, has been well documented elsewhere (Biddle, 2012b, Birdsall-Jones and Corunna, 2008, Milligan, Phillips et al., 2011b). Housing affordability directly affects the type, quality and security of housing individuals can access and disproportionately affects disadvantaged populations (Mason, Baker et al., 2013). The median income of Aboriginal people is 65% of the national median and Aboriginal people are also significantly less likely to inherit wealth, in part due to lower home ownership rates. As evocatively stated by Nova Peris, the first Aboriginal woman elected to federal parliament, 'Aboriginal people have no inherited wealth, they have inherited pain' (Kelly, 2016).

Further, poverty was not said to occur in isolation from other forces. Rather poverty amongst Aboriginal people was created in the context of current and historical experiences of dispossession, racism and marginalisation. That is to say, racism, in addition to directly affecting access to housing in the ways discussed above, also often affects Aboriginal peoples' education and employment prospects, which in turn affect income, social status, social inclusion, health and wellbeing, all of which further affect the ability to obtain and maintain suitable housing. Poor housing conditions then further affect health, education and other non-shelter outcomes. In these ways, study participants held that housing disadvantage in the Aboriginal community was beyond that experienced by other low income groups. These elements of participant discussion accord well with Collins' theory of intersectionality, which exists within the realm of critical race theory, and highlights that forces such as race, class, gender and ability are not discrete entities but rather are reciprocally constructing phenomena which interact to create trajectories of oppression and privilege (Collins, 2015, Ritzer, 2013).

3.8.3 'Strangers in our own Country': neighbourhood marginalisation

Several factors, including poverty and racism, severely limited the choice many participants had about where they lived. The severe shortage of affordable housing, particularly social housing, meant that when social housing of any kind became available, it was accepted regardless of the dwelling's suitability, quality or location.

'You have to live where they put you.' (Elderly female client)

'I had no choice but to take mine... I said, 'Look I'm sick of carrying my kids around, travelling from one place to another, from one refuge to another'. I said, 'Enough is enough, I'll take this place'.' (Middle-aged female client)

Many described a sense of being relegated to live in '*bad neighbourhoods*', areas where others do not want to live. Participants said many neighbourhoods in Western Sydney had problems with drugs, violence, graffiti, theft and racial tensions,

'I don't think anyone'd [choose to live] in the street where I am. I've had shootings out the front of my place, twice. People down the road sell drugs, they've got guns at their house and others down the road have guns... and all coppers raiding the place, helicopters, dogs, the dog squad.' (Elderly female client)

Some said that with gentrification and the rising cost of real estate in Sydney, the disadvantaged were increasingly marginalised to outer and less desirable suburbs with physical and social problems and less proximity to transport, services and employment opportunities,

'The poor people are put in dangerous areas, you know on top of toxic waste dumps, next to the big power transmission lines that give you leukaemia...they're moving them further out of town, you know? Fringe dwellers.' (Middle-aged male staff)

Participants said social problems in many Western Sydney suburbs attracted negative media attention, '*It's always a bad story*'. Some felt the depictions of their neighbourhoods were simplistic, sensationalist and further perpetuated stigmatisation of the area.

'When they do film Mt Druitt around here they show the worst areas. They show the bin area of the shops.' (Young female staff)

While most participants described their neighbourhoods as disadvantaged and marginalised and acknowledged social problems in many local suburbs, a sub-group of participants expressed a more nuanced view. They tended to be those who had stable housing and had lived in the same neighbourhood for a long time. They said many

suburbs near Mt Druitt had good access to public transport, shops and culturally appropriate health and education services. They also described variation between areas at a street level, with some streets described as *'the Bronx'* and others nearby as safe places to raise a family. Despite not having chosen where they lived and feeling they lived in a *'bad area'*, some had nonetheless made their neighbourhoods *'home'* and expressed a sense of belonging in their local community,

'People say, 'What do you love about [suburb]?'. I say, 'I love it'. I made it my own. My kids have grown up and loved it, and they've gone to that one school. And my neighbours... we stand outside and have a yarn... and people are looking out for each other.' (Elderly female staff)

'I like where I am, although it has got a bad name.' (Middle-aged female staff)

These views echo recent research conducted in Mt Druitt about the experience of living in 'disadvantaged' places (Pawson and Davison, 2014). Though Pawson and Davison's work did not have an Aboriginal focus, their participants likewise acknowledged that crime, disaffected youth, graffiti, violence and a lack of employment opportunities were present and problematic to some extent in their neighbourhoods, but felt media reports exaggerated these problems. In an examination of the use of the term 'the Bronx' in Australia, a common signifier of a 'slum' or public housing trouble-spot, Birdsall-Jones argues that this metaphor is as much about stigma and bourgeois imaginations of deprivation as it is about actual neighbourhood attributes (Birdsall-Jones, 2013). As in the current study, Birdsall-Jones likewise noted the role of the media in creating and perpetuating place-based stigma and that the loaded term 'the Bronx' is sometimes adopted by residents and other times rejected. Regardless of their reaction to it, such stigmatising discourse can have real-world consequences for residents, from compromised employment prospects (Pawson and Davison, 2014) to actual displacement, as occurred for residents of one public housing estate in NSW which was demolished - at considerable social and financial cost - due to 'moral panic' after it was labelled as 'the Bronx' and characterised as a 'focal point for poverty' and a 'haven for criminals' (Arthurson, 2004, Birdsall-Jones, 2013). Thus, social representations of places, as well as cultural groups, can be powerful forces that affect resident wellbeing.

Living near other Aboriginal people, particularly extended family, was considered highly desirable to enable people to develop social support networks, access Aboriginal organisations and services and to foster a positive sense of identity and belonging. The importance of local Aboriginal connectedness as an invaluable form of social capital has also been noted in other studies, particularly in the context of racism, marginalisation and unequal access to economic and cultural capital (Browne-Yung, Ziersch et al., 2013, Dockery, 2010). Many spoke of feeling ostracised in more affluent parts of Sydney,

- Elderly female client: *'When my daughter was over at [wealthy suburb], she was in a refuge over there ... one of the white fellas said to her, 'You don't see many of your people around here', as if to say...'*
- Elderly female staff: *'Yeah, 'You're out of your ground'.'*
- Elderly female client: *'It's, 'You stay over there and we'll live over here'.'*
- Middle-aged female client: *'Yes. We're strangers in our own country.'*

This finding has parallels with a study in Winnipeg, Canada, where Indigenous people's sense of place in the city was found to be constrained not only by a shortage of affordable housing but also the 'systemic erasure of Indigeneity from the urban sociocultural and political landscape' (Alaazi, Masuda et al., 2015, p. 30). While explicit segregation policies ended decades ago in Australia (Bailie, 2007), neighbourhood marginalisation remains, maintained by less direct economic and social forces. Those living in urban areas are generally not thought to be geographically isolated from employment, education and housing opportunities, yet as other have also shown, place-based disadvantage exists within cities (Pawson and Davison, 2014), this and other forms of marginalisation are common for urban Aboriginal people (Gallaher, Ziersch et al., 2009).

3.8.4 'It's a basic human right and they have failed in their duty': views about reasons for social housing shortfalls

Social housing was described as an essential service for the Aboriginal community given the barriers faced in the private market. Participants acknowledged the state as

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the main provider of social housing in Sydney and while social housing was desirable in that it provided relative affordability and stability, problems with availability and cultural safety were said to further contribute to Aboriginal housing disadvantage. Participants overwhelmingly expressed the desire for stable housing, with social housing seen as the most feasible way to achieve this as others have previously found (Birdsall-Jones and Corunna, 2008). Commonwealth Rent Assistance (financial assistance for low income renters) was not considered an adequate replacement for physical social housing, as it was not sufficient to make private rental affordable and did not resolve discrimination or insecure tenure.

'You've got to have social housing, because they're not going to cope in private.'

(Elderly Female Client)

Anger was expressed about the major shortage of social housing in Sydney and what appeared to be the widespread sale of public housing,

'If someone moves out of the house, they're selling them. Around my area there's just empty houses with for sale signs.' (Elderly female client)

These observations accurately reflect the changes in Australia's social housing landscape. The widespread sale of state-owned public housing stock, growing social housing waiting lists and declining funding for the maintenance of existing stock are all a matter of public record (Jacobs K, Atkinson R et al., 2010, Milligan, Phillips et al., 2011b, Nethercote, 2014, NSW Audit Office, 2012, Pawson and Davison, 2014). Some academics question the future of public housing in Australia given its chronic underfunding and express concern about the housing futures of disadvantaged populations like Aboriginal Australians (Jacobs K, Atkinson R et al., 2010). Amidst participant concern that an already inadequate social housing sector appeared to be shrinking and fears the housing situation for urban Aboriginal people was worsening, there were calls for housing to be seen through a human rights lens as a pivotal determinant of health and wellbeing for Aboriginal people.

'It's a basic human right and they have failed in their duty.' (Older Male Staff)

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But participants believed that many non-Aboriginal people resent the provision of state services to Aboriginal people, which they felt was the result of inflated imaginings about assistance provided and inaccurate understandings of Aboriginal people's lived experiences,

Middle-aged female client: *'Whitefellas are complaining now about blackfellas getting this, that and the other....'*

Older female client: *'They don't know nothing'*

Middle-aged female client: *'That's right, they don't walk in our shoes'*

As argued by Jones (2002), institutionalised racism often manifests as inaction in the face of unmet need, or, as our participants held, action of an insufficient scale to adequately address need. Existing research has shown that negative opinions of and misunderstandings about the provision of state welfare to Aboriginal people are widespread in the general population; in one NSW survey, over half of respondents believed Aboriginal people were 'treated over generously by the government' (Dunn and McDonald, 2001, Paradies, 2005). In another survey, 65% of Australian participants falsely believed Aboriginal people received more social security benefits than non-Aboriginal people and one third believed that the government paid off Aboriginal people's car loans (Pedersen, Griffiths et al., 2000).

With regard to housing, the common misbelief that Aboriginal people are given free government housing which they then '*trash*' has been discredited through research evidence; in audits of over 9,000 remote Aboriginal houses by independent tradespeople, only 9% of items required repair due to householder damage, overuse, misuse or vandalism (Creative Spirits Website, Lea and Torzillo, 2016). Yet these and other racist beliefs persist (Creative Spirits Website). Participants believed that such misconceptions fuel racist beliefs and weaken political will to invest appropriately in social housing for Aboriginal people.

Despite the expressed need for more social housing, interaction with state and other institutions was a fraught issue. Many found it inherently intimidating and stressful to interact with government, religious and similar institutions. They said Aboriginal people

often come to these services essentially traumatised by a range of painful life experiences associated with colonisation. This was particularly the case for members of the Stolen Generations, those Aboriginal people who were removed from their families as children under previous acts of parliament and placed in government or church institutions, or fostered to non-Aboriginal families (Commonwealth of Australia, 1997, NSW Department of Health, 2004).

'There's a lot of us out there from the stolen generation. You walk into a place like Housing or the Police or anything like that - to us, you know, that's where you shrink right down. Because we've been pushed around, through the homes and all that. That still does have an effect on a lot of our people.' (Older male staff)

There was considerable discussion about the difficulties Aboriginal people experienced navigating housing bureaucracies. Little distinction was made between 'mainstream' social housing (Housing NSW) and the Aboriginal Housing Office (AHO), due mainly to centralised service experiences, so they are grouped for the following discussion,

'I'm in an Aboriginal housing house, but yet I have nothing to do with anybody at all from Aboriginal housing. I pay my rent to normal housing. If I have maintenance issues, it's normal housing. If I fall behind in rent or if there's any problems I ring up normal housing. I do not see anybody at all from Aboriginal housing' (Middle-aged female staff).

Milligan et al. likewise determined that, despite the fact that the AHO has an Aboriginal-controlled governance structure, many existing urban housing policy approaches remain 'undifferentiated and not adequately responsive to the needs and preferences of Indigenous clients', which may in part be due to undifferentiated service delivery models, such that 'in practice, there is no differentiation between these two service options for clients' (2011b, p. 36).

Some expressed concern about an observed shift towards housing service provision by non-government organisations (NGOs); that housing services may become less accessible, transparent, culturally sensitive, efficient, accountable, or that service gaps may emerge if the priorities of individual charities do not match the Aboriginal community's needs. Others felt that, given the extreme shortages, all social housing

was to be welcomed regardless of the providing organisation. Remaining on the social housing priority list was said to require unreasonably burdensome and demoralising *'jumping through hoops'*, including providing written weekly evidence of numerous unsuccessful applications for private rental signed by real estate agents and demonstrating their homelessness by calling a hotline each day. These and other requirements saw the most vulnerable applicants regularly fall off this list; one participant had, as a result, been *'house-hopping'* for six years with her four children. Those living in social housing spoke of feeling very conscious of living under state control, which intruded into the intimate space of the family home. *'The rules'* – inflexibly applied and often culturally inappropriate social housing policies – limited where people lived, how much rent they paid, what repairs or maintenance were done, the ability to host others, relocate and myriad other considerations. *'The rules'* were often in direct opposition to important cultural obligations, including the responsibility to host family and friends in need,

'You need to understand the dynamics of how the culture is, how the families work together, how the kinship is, all that sort of stuff. Because that's what matters to us and that's the rules we've got to go by, you know? We can't go by, 'You're not allowed to have Fred or Harry in your house', because you know what will happen if you do that? Well then, you know, you're off the Christmas list, and then you're back on your own.' (Young male staff)

'Yes, break the rules, but all you need is one inspector to come around and say 'oh look at this' and you're out in the street.' (Middle-aged male staff)

Thus *'the rules'* regularly put Aboriginal tenants in impossible situations, having to balance the risk of breaking two sets of rules, both with significant consequences – social ostracism or eviction. In this way, uniform housing rules did not always result in housing equity (Berman and Paradies, 2008).

Recognition of the role of policy and the law as instruments that legitimise white cultural dominance is a key feature of critical race theory (Banivanua-Mar, 2007, Delgado and Stefancic, 2012). It argues that law and policy are not neutral constructs, but are generally created by the privileged majority and - unconsciously or otherwise -

favour the norms, values and assumptions of the average white experience. The dominance of state tenancy law over Aboriginal cultural obligations has been tested to some extent in case law in Western Australia, where the Supreme Court ruled against an Aboriginal tenant evicted due to neighbours' complaints of acts of nuisance (Western Australian Parliamentary Debates, 2005). The tenant claimed any acts of nuisance were committed due to the pressures of living in very overcrowded conditions and that she was culturally obliged to house family who were otherwise homeless.

None of this is to suggest that all tenancy rules or their enforcement are in themselves inherently considered problematic by Aboriginal tenants. Indeed, in a nuanced examination of the role of housing 'rules' in remote Aboriginal communities, tenants in some situations found housing rules helpful in setting boundaries to prevent antisocial behaviour in their homes (Moran, Memmott et al., 2016). This was, however, highly dependent on genuine collaboration and trusting relationships between tenants and housing providers and tended to occur in cases where housing was provided by Indigenous Community Housing Organisations, which are more likely to be culturally safe organisations (Moran, Memmott et al., 2016).

Participants in the current study acknowledged efforts to improve the cultural competence of state housing services, including the employment of frontline Aboriginal staff and cultural training for non-Aboriginal staff. However, these efforts were described as insufficient and even tokenistic; too few frontline Aboriginal staff were said to be employed to ensure availability and cultural training programs did not always translate into respectful interactions. Some spoke of feeling '*talked down to*'. This comports with recent research in Queensland, Australia, which found that many frontline social housing service staff had poor knowledge of Indigenous culture, with some considering Indigenous cultural practices problematic to tenancy sustainment (Proudfoot, 2015). While Aboriginal housing staff improved the customer service experience, which was described by participants as important, some expressed frustration that Aboriginal staff had '*no real clout*' as they were constrained by the policies and resource shortages of the employing organisation. Some felt frontline

Aboriginal staff were put in a difficult position through their work. This was also the case for those Aboriginal people in senior positions in housing organisations,

'The Aboriginal people that are in the system... they're in a mainstream system that has policies. And we think that because they're there, they can change policies, and make things happen, you know? They're just feeding Aboriginal people who work in the system to their own people, who then want to eat them up, and they're powerless.' (Elderly female client)

Indigenous Community Housing Organisations (ICHOs) were seen as culturally safe organisations, despite expressed resentment over perceived top-down '*mainstreaming*' of ICHOs, including then-recent moves to standardise rental policies across NSW. However, ICHOs were said to have too few properties in Sydney to be a major player and some believed they should constitute a larger piece of Sydney's community housing sector,

'Our own housing companies have a shortage of houses and a shortage of funds, because what should have been allocated from governments, both state and federal, has been swallowed up by non-government agencies.' (Middle-aged male staff)

As will be discussed in the next theme, recent years have seen ICHOs play a reduced role in the provision of housing in Australia due to shifts in government support towards other providers, a policy approach very different to that being adopted in Canada (Milligan, Phillips et al., 2011b, Moran, Memmott et al., 2016, Walker, 2008).

Just as government policy can be an instrument for direct and indirect oppression, it can also be a tool for intervention and remedy. For example, when the Western Australian (WA) Substantive Equality Unit uncovered widespread racism towards Aboriginal people in the WA private rental system (2011), the Department of Housing in WA abolished past requirements for Aboriginal people to demonstrate their attempts to apply for private rental properties in order to be eligible for priority public housing. This requirement, also reported by participants in the current study, was deemed to be 'not only unrealistic in many circumstances due to the relatively high

Chapter 3: *Study Two*, Urban Aboriginal perspectives about housing disadvantage cost, it was humiliating for them to face often blatant discrimination from agents or owners' (Equal Opportunity Commission, 2011, p. 26). Thus this kind of proactive enquiry and anti-racist policy has the potential to directly improve housing services and social and emotional wellbeing for Aboriginal people (Berman and Paradies, 2008).

3.8.5 'We don't have a voice anymore': the struggle against loss and disempowerment

An overarching theme that flavoured much of the participant discussion was that of disempowerment. Participants described a housing landscape in which Aboriginal people had limited control at both individual and community levels. Experiences of poverty, racism and marginalisation, which often necessitated seeking help from government and other institutions, were said to culminate in a general sense of disempowerment for many Aboriginal people. Disempowerment in turn was said to engender housing disadvantage for all but the most financially secure and well-educated in their community.

At the individual level, housing disadvantage and frequent upheaval was said to create uncertainty and limit the extent to which individuals could control other aspects of their lives, including the ability to complete higher education, seek or maintain employment and provide optimally for their children's needs. Conversely, stable, affordable housing was described as an empowering force in Aboriginal people's lives. Participants' beliefs about the importance of housing to '*break the cycle*' of disadvantage reflected Maslow's hierarchy of needs (Gorman, 2010); where until people have their needs for secure shelter met, they are impaired in their ability to raise their families, work, study, parent or reach their full potential.

Participants also described a pervasive sense of unease about their vulnerability to changes in government and institutional policies. Even those with long-term public housing tenancy said they felt persistently apprehensive about the possibility of losing their home if housing policies changed.

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This sense was reinforced by the perception that, at a collective level, Aboriginal people have insufficient influence over urban housing policy and housing service delivery, particularly as organisations that ostensibly aimed to increase Aboriginal political influence had been shut down for various reasons over time.

- Elderly male client: *'We had the Loans Commission... the ADC [Aboriginal Development Commission], and we came down to ATSIC [Aboriginal and Torres Strait Islander Commission], and now it's gone. And we're basically left with, as far as housing's concerned, AHO [Aboriginal Housing Office] and Land Councils [bodies that represent Aboriginal land interests that sometimes operate as ICHOs] as organisations. So we really don't have....'*
- Elderly female client: *'So we don't have a voice anymore.'*
- Elderly male client: *'No, it's been taken away.'*

Underpinning this was the notion that Aboriginal people were not genuinely included in political decision-making and that some existing consultation processes only really served to mask a reality of exclusion and withholding (Habibis, Taylor et al., 2016). State-funded Aboriginal community-controlled organisations, for instance, were said to be given limited power, their existence was precarious and at the discretion of the state,

'They only give you a little bit not a lot. They put it on a string and then take it back. They're not stupid.' (Middle-aged female client)

Such discussions touched on critical race theory's principle of 'interest convergence', which contends that dominant racial groups will support or tolerate advances for racial justice and equity while it is in their mutual interest – for instance, promotion of the narrative that a nation is fair and democratic - but only to the point where it begins to substantively compromise their position of privilege (Banivanua-Mar, 2007, Castagno and Lee, 2007).

Some suggest that this kind of cultural disempowerment may be as destructive as material poverty. Choo (1990, p. 11) argues that for Aboriginal people, 'material poverty, which can be measured through social indicators such as income, employment, housing, health, education and criminality, is secondary to the more deep-seated deprivation that is the consequence of cultural invasion, racism and oppression'.

Despair and disengagement were frequently expressed,

'Look I've been a long time, well over 30 years, fighting for Aboriginal rights ... and I'm very disillusioned with where we're going. I think we've got worse. At least in the old days, we had the older people. They'd stand out the front and they'd give it to em. Today ... the fire in the belly's gone out.' (Older male client)

This is not to suggest that participants' responses to feelings of disempowerment were that of passive resignation; rather that attempts to secure appropriate, stable housing was a continuous uphill '*battle*' against the odds. This battle was a modern, urban symbol of the ongoing effects of colonisation and dispossession,

'They took the land, now we're fighting for a house to put on it.'

(Middle-aged female client)

Despite a predominant sense of frustration and powerlessness, critical praxis, agency and resistance were evident in several ways (Collins, 2015, Petray, 2012). More an expression of exasperation than real suggestions were calls for a class action against the state for substandard social housing and exposing people to health hazards like mould and damp, or collective action such as tenants '*standing together*' refusing to pay rent until maintenance was done. There were several reports of local Aboriginal people with knowledge and skills providing informal advocacy to help more vulnerable community members access and negotiate with the housing bureaucracy. Support included acting as spokespeople, assistance completing forms, obtaining required documents, negotiating to have applications triaged appropriately or to have repair work done. These services were also said to be routinely provided by AMSWS health professionals, though technically outside their role, given the crucial impact they believed housing had on health. There were calls for the creation of local specialist Aboriginal housing advocate positions to meet this community need, employed

through health or another agency outside of the housing sector to avoid conflicts of interest. ACCHS staff are valuable intermediaries as their trusted status, their personal and professional experiences with housing problems and their knowledge of the local community and culture combined with their familiarity working with government and other agencies mean they can communicate effectively with both groups.

In the context of empowerment, discussions about the symbolic and pragmatic importance of the governance of housing services held particular significance. As noted in the previous theme, some called for more social housing services to be provided through ICHOs, yet others considered the state a more stable, albeit imperfect, provider. Participant discourse about the role of the state in Aboriginal housing touched on conceptual work by Sanders about self-determination and the policy tensions between philosophies of equality, choice and guardianship in Indigenous affairs (Sanders, 2009). In Australia, since the folding of ATSIC, the trend has been towards mainstreaming the delivery of Aboriginal social housing through government (AHO) and non-government (CHP) providers, rather than ICHOs (Milligan, Phillips et al., 2011b, Moran, Memmott et al., 2016, Walker, 2008). The shift away from ICHOs towards state-managed social housing has occurred 'at a time when national [mainstream social housing] policy was operating in the opposite direction, towards increasing the housing management role of community housing providers [CHPs]' (Habibis, Phillips et al., 2015, p. 1). In contrast, the approach in Canada has been for the state to provide funding and support (albeit short term and insufficient) to local Indigenous housing providers (Walker, 2008). All participants in this study believed culturally appropriate housing services were essential, many considered ICHOs desirable providers, and most held a view similar to the argument made by Walker, that self-determination is not in itself enough to alleviate urban Aboriginal housing disadvantage unless it is accompanied by adequate state resources. Participant distress about the pressing need for more social housing was unmistakable; government action and resources, along with genuine Aboriginal community engagement, were described as crucial for improving the status quo.

Aside from obvious potential implications for housing outcomes, these housing policy decisions also have potential implications for health and wellbeing. Australian Aboriginal tenants of state housing authorities have been found to be significantly more likely to report fair or poor health compared to those who rent their dwelling from an Indigenous or Community Housing Provider after adjustment for socioeconomic and demographic factors (Biddle, 2011b). In Canada, an inverse relationship has been demonstrated between suicide rates and the number of Indigenous community-controlled organisations (health, education, housing or justice) present in a community (Chandler and Proulx, 2006). Along with culturally appropriate services, Chandler and Proulx posited that such organisations generate community-wide benefits beyond the services they provide, including a sense of joint responsibility, purpose and control that was protective against the disruption and despair often left in the wake of colonisation (Anderson, 2010, Chandler and Proulx, 2006). Empowerment - the ability to control one's life - is increasingly being recognised as a determinant of health in its own right, particularly in regard to Aboriginal health and wellbeing (Anderson, 2010, Tsey, 2008, Wallerstein, 2006).

3.8.6 Generalisability, limitations and implications

This paper offers insights to aid understandings of the notable disparity in housing statistics between Aboriginal and non-Aboriginal Australians, based on the views of urban Aboriginal people experiencing and witnessing this disadvantage. Participants associated many factors with urban Aboriginal housing disadvantage, with the key message that housing disadvantage was chiefly the result of the underlying structural force of unequal race relations. This explanatory framework differs significantly from discourses of individual responsibility (Pearson, 2011). While critical race theory provides a useful platform for understanding racial inequalities, a danger of this macro-view lens is that it can overlook the agency, resistance, resilience, achievements and responsibilities of Aboriginal people (Lane, 2007, Petray, 2012). As Petray argues, 'even in the most oppressive situations, Aboriginal people continue to exert agency' (2012, p. 3). While we agree that the actions of individuals also matter, we concur with the participants of this study that for Aboriginal people, the oppressive situation is the fundamental problem which must be addressed.

Chapter 3: *Study Two*, Urban Aboriginal perspectives about housing disadvantage

This study is based on the views expressed by the clients and staff of the Aboriginal Medical Service Western Sydney. Findings are not necessarily generalisable to Aboriginal peoples in other geographical areas and social circumstances. For instance, in studies with Aboriginal people living in remote communities, traditional cultural values such as mobility and connection to Country more strongly influenced housing preferences than in the current study (Habibis, 2013, Memmott, Birdsall-Jones et al., 2012).

While this work focuses on urban Aboriginal housing, the shared histories underpinning remote and urban housing issues, including colonisation, dispossession, racism and poverty, explain the many parallels between these findings and those conducted in remote Australian communities and with first nations peoples in other colonised countries (Anderson and Collins, 2014, Bailie, 2007, Habibis, 2013, Milligan, Phillips et al., 2011b, Moran, Memmott et al., 2016, Paradies, 2016). The findings may also have resonance for other marginalised and disadvantaged ethno-racial groups including minority migrant and refugee communities attempting to find housing in Sydney. Findings related to neighbourhood and housing service provision may vary in their applicability in other settings given differing housing market environments and service provision models.

We are also conscious that this paper was created within institutional contexts that participate in the very power relations we are examining (Castagno and Lee, 2007); the appropriation of Aboriginal knowledge, interpreted through a theoretical lens and written in academic parlance by a team with a white lead author for a well-educated audience. Furthermore, a paper about the systemic forces behind Aboriginal housing disadvantage based on the accounts of those experiencing and witnessing this disadvantage may also be accused of contributing further to the simplistic stereotyping of Aboriginal lives. We hope the faithfulness with which we have endeavoured to convey the voices of study participants, the contributions of Aboriginal co-authors, collaborations with Aboriginal organisations and the processes in place to ensure that this publication is acceptable to the Aboriginal community allay these concerns. SEARCH was established to provide high quality research information to participating

AMSs about issues of concern to them; this information is then used by AMSs for service delivery planning and for advocacy purposes.

Our analyses have several implications for the Australian housing sector and beyond. We join other scholars in calls for more investment in social and affordable housing to adequately address high levels of unmet need, along with moves to make housing services more accessible and culturally safe for urban Aboriginal people (Biddle, 2009b, 2012b, Birdsall-Jones and Corunna, 2008, Milligan, Phillips et al., 2011b). Improving the cultural safety and accessibility of limited, state-funded housing services is complex and there are no quick or simple fixes. Milligan et al. (2011b) make many constructive suggestions which are likely to address many of the concerns expressed by our participants, including: ongoing partnerships between Aboriginal and government organisations which operate in a genuinely respectful intercultural space strengthening the capacity of local Aboriginal community-controlled organisations; specialist culturally appropriate service delivery modes, including outreach programs; specialist programs and support for at-risk Aboriginal tenancies; and the adoption of key performance indicators that include improving successful Aboriginal tenancy sustainment.

The specific suggestion for housing liaison positions to be funded within urban ACCHS is compatible with the holistic view of health held by ACCHS and would no doubt help improve institutional interactions and potentially also tenancy outcomes. It may also enable the provision of appropriate social and emotional support if, as described by our participants, distress arises while navigating housing challenges. But improved service delivery alone will not improve urban Aboriginal housing disadvantage unless accompanied by more resources for social and affordable housing (Walker, 2008).

Housing markets, including Sydney's, are not race-neutral spaces (Equal Opportunity Commission, 2011, Macdonald, Nelson et al., 2016, Turner, Santos et al., 2013). Thus a race-conscious approach is appropriate to remedy existing urban housing disparity; distributional inequity, or affirmative action, is required to level the playing field

(Habibis, Taylor et al., 2016, Paradies, 2005). In addition to social justice arguments, a strong economic rationalist case can be made for investment in supportive housing and improved housing conditions, with evidence that downstream savings on health and other government services are recouped in relatively short timeframes (NSW Department of Health, 2010, Parsell, Petersen et al., 2016). Particularly high direct returns have been demonstrated for the provision of permanent supportive housing to youths and families with young children (Chase, Da'ar et al., 2012).

Given the core role of racial discrimination – overt, covert and unintended – in the creation and maintenance of disadvantage, action is also required to proactively address racism, both within the housing sector and well beyond, including in the realms of education, employment, health care and criminal justice. We concur with Berman and Paradies' call to 'bring anti-racism praxis to the fore via policies and programs that focus on broader community attitudes and social systems' (Berman and Paradies, 2008, p. 6) p.6. They advocate a proactive, whole of government approach with explicit focus on mainstream community attitudes (Berman and Paradies, 2008, Beyond Blue, 2016).

3.9 Conclusion

This paper adds urban Aboriginal people's voices to existing evidence about the central role of race power relations in the creation and perpetuation of urban Aboriginal housing disadvantage. In keeping with critical racial theory, racial discrimination was said to manifest in reduced access to both material goods and power. The relationships between poor housing and poverty, discrimination, marginalisation and disempowerment were described as multi-directional. That is, housing disadvantage results from these phenomena and in turn, poor housing situations play a central role in the perpetuation of ongoing poverty, racial stereotypes, disempowerment and marginalisation. The impact of these forces was exacerbated by Sydney's increasingly competitive housing market and struggling social housing system. The paper also contributes new empirical insights about the impact of these forces, along with the resultant housing disadvantage, on individual and collective psychosocial wellbeing, broadening existing literature about the links between Aboriginal housing and wellbeing. For Aboriginal people experiencing housing disadvantage, their housing

difficulties are both a result and a symbol of the historical and ongoing effects of colonisation.

Our findings support existing literature calling for increased government investment in targeted, culturally appropriate social and affordable housing for urban Aboriginal people commensurate with the scale of unmet need. Action to address racism within and beyond the housing sector is also indicated. All such actions will require political will and respectful intercultural exchange to ensure real and sustained progress.

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CHAPTER 4: *STUDY THREE*, HOUSING CONDITIONS OF URBAN ABORIGINAL HOUSEHOLDS BY TENURE TYPE

4.1 Preamble

In **Chapter 2**, participants reported that housing problems such as instability, unaffordability, crowding and poor dwelling conditions were common. Dwelling conditions were said to be poorest in social housing, yet social housing was still considered a desirable tenure type due to the relative stability and affordability it provides. While empirical research also indicates that differences in housing attributes (crowding, affordability, quality and mobility) exist by tenure type, the data reported for urban Aboriginal housing often lack detail or are not reported separately for urban Aboriginal people and examinations of these correlates are not often controlled for sociodemographic confounders.

This study provides granular detail about the prevalence of self-reported housing problems in the SEARCH cohort and examines differences in exposure to housing problems reported by SEARCH carers according to tenure type.

4.2 Copyright statement

I certify that this publication was a direct result of my research towards this PhD, and that reproduction in this thesis does not breach copyright regulations.

Andersen, M., Williamson, A., Wright, D., Fernando, P. and Redman, S. (2017).
'Housing conditions of urban households with Aboriginal children in NSW
Australia: tenure type matters.' BMC Public Health 18(70).

Signed

A handwritten signature in black ink, appearing to read 'Melanie Andersen', with a long horizontal stroke extending to the right.

Melanie Andersen

September 2017

4.3 Study Three, Housing conditions of urban households with Aboriginal children in NSW Australia: tenure type matters

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Study Three has been published in *BMC Public Health* (Andersen, Williamson et al., 2017b)

4.4 Author contributions

Study conception and design: **MA**; AW; PF; DW; SR. Acquisition of data: **MA**; PF; DW. Data analysis: **MA**. Interpretation of findings: **MA**; AW; PF; DW; SR Writing of manuscript: **MA**. All authors read and gave critical feedback on the manuscript and approved the final manuscript.

4.5 Abstract

Background: Housing is a key determinant of the poor health of Aboriginal Australians. Most Aboriginal people live in cities and large towns, yet research into housing conditions has largely focused on those living in remote areas. This paper measures the prevalence of housing problems amongst participants in study of urban Aboriginal families in New South Wales, Australia, and examines the relationship between tenure type and exposure to housing problems.

Methods: Cross-sectional survey data were provided by 600 caregivers of 1406 Aboriginal children aged 0-17 years participating in Phase One of the Study of Environment on Aboriginal Resilience and Child Health (SEARCH). Regression modelling of the associations between tenure type (own/mortgage, private rental or social housing) and housing problems was conducted, adjusting for sociodemographic factors.

Results: The majority (60%) of SEARCH households lived in social housing, 21% rented privately and 19% either owned their home outright or were paying a mortgage ('owned'). Housing problems were common, particularly structural problems, damp and mildew, vermin, crowding and unaffordability. Physical dwelling problems were most prevalent for those living in social housing, who were more likely to report three or more physical dwelling problems than those in owned (PR 3.19, 95%CI 1.97, 5.73) or privately rented homes (PR 1.49, 1.11, 2.08). However, those in social housing were the least likely to report affordability problems. Those in private rental moved home most frequently; children in private rental were more than three times as likely to have lived in four or more homes since birth than those in owned homes (PR 3.19, 95%CI 1.97, 5.73). Those in social housing were almost half as likely as those in private rental to have lived in four or more homes since birth (PR 0.56, 95%CI 0.14, 0.77). Crowding did not vary significantly by tenure type.

Conclusions: The high prevalence of housing problems amongst study participants suggests that urban Aboriginal housing requires further attention as part of efforts to reduce the social and health disadvantage experienced by Aboriginal Australians. Particular attention should be directed to the needs of those renting in the private and social housing sectors, who are experiencing the poorest dwelling conditions.

4.6 Background

There is a large body of international evidence that housing environments affect human health, productivity and wellbeing (Baker, Lester et al., 2016, Dockery, 2013, Dunn, 2002, Howden-Chapman, Matheson et al., 2007, Marsh, Gordon et al., 2000, Thomson, Thomas et al., 2013). Housing disadvantage can take many forms, including poor physical dwelling conditions, crowding, instability and unaffordability (Baker, Lester et al., 2016, Howden-Chapman, 2004); thus, it can affect people through myriad direct and indirect pathways (Saegert, Klitzman et al., 2003). For instance, dampness is associated with respiratory illness, crowding with stress and infectious disease, frequent residential moves with poor child education and unaffordability with poor mental health (Dockery, 2013, Howden-Chapman, 2004, Phibbs and Thompson, 2011). Multiple forms of housing problems can also coexist and have a compounded, cumulative impact on physical and mental health, particularly after prolonged exposure during childhood (Baker, Beer et al., 2017, Baker and Lester, 2016, Howden-Chapman, 2004, Marsh, Gordon et al., 2000).

Aboriginal Australians experience significant disadvantage on many social indicators compared to non-Aboriginal Australians, including health, life expectancy, education, employment, imprisonment and housing (Steering Committee for the Review of Government Service Provision, 2014). Inadequate housing has long been considered a key determinant of the poor health status of Aboriginal and Torres Strait Islander Australians (Australian Housing Ministers' Conference, 2001, Dowling and Ward, 1976, Gracey, Williams et al., 1997) (hereafter Aboriginal). Similar relationships between poor housing and poor health have been noted for first nations peoples in other wealthy countries with histories of colonisation and dispossession, such as Canada, New Zealand and the United States of America (Anderson and Collins, 2014, Riva, Plusquellec et al., 2014, Webster, 2015). Many Aboriginal communities in remote parts of Australia experience high rates of severe overcrowding, homelessness and very poor dwelling conditions. In many remote communities, basic amenities required to engage in 'Healthy Living Practices' (HLPs), including flushing toilets, facilities required to bathe, wash clothes or prepare and store food adequately, have been found missing or non-functional in a substantial proportion of households (Bailie, Stevens et al., 2010, Bailie

and Runcie, 2001, Bailie and Wayte, 2006, Gracey, Williams et al., 1997, Pholeros, Rainbow et al., 1993, Torzillo, Rainow et al., 1993, Torzillo, Pholeros et al., 2008).

While the housing problems experienced by many Aboriginal people in remote communities are of obvious and pressing concern, the majority (79%) of Aboriginal Australians live in major cities and large regional centres (ABS, 2016). Yet few studies have specifically examined the housing conditions experienced by urban Aboriginal people. This parallels a broader dearth of research about the health of urban Aboriginal Australians, even though their burden of illness is higher than that of remote Aboriginal people (Eades, Taylor et al., 2010, Silburn, Blair et al., 2007, Vos, Barker et al., 2009). Moreover, Baker et al. cite a more widespread under-acknowledgement of housing problems in the general Australian population (Baker, Lester et al., 2016). Recent research found that the 'hidden fraction' of Australians living in poor quality housing is actually quite substantial; over 100,000 Australians are estimated to live in housing classified as 'very poor-derelict' and Aboriginal Australians were three times more likely than non-Aboriginal Australians to live in dwellings meeting this classification (Baker, Lester et al., 2016).

The existing body of research into urban Aboriginal housing conditions is scant, but what is known suggests the need for further attention. Qualitative research highlights housing as an issue of significant concern for urban Aboriginal Australians (Andersen, Williamson et al., 2016, Birdsall-Jones and Corunna, 2008, Equal Opportunity Commission, 2011, Milligan, Phillips et al., 2011b). Urban Aboriginal people fare notably worse on most available housing indicators than their non-Aboriginal neighbours in national surveys, with higher rates of household crowding, homelessness and need for repairs (AIHW, 2009, 2014c). Aboriginal-specific surveys provide greater detail about dwelling conditions and reveal that the proportion of urban Aboriginal households experiencing crowding and poor dwelling conditions is lower than for those in remote communities (AIHW, 2014c, Department of Social Services, 2015, Silburn, Zubrick et al., 2006). However, in absolute terms, higher numbers of those Aboriginal people experiencing crowding live in cities and towns and some housing issues such as unaffordability, homelessness and frequent residential moves are more prevalent for

urban Aboriginal people (Biddle, 2012b, Silburn, Zubrick et al., 2006). Over 8% of the Perth metropolitan homes surveyed in the Western Australian Aboriginal Child Health Survey (WAACHS) were classified as being in poor condition, having failed three or more of the eight indicators of basic household functioning required to perform HLPs (Silburn, Zubrick et al., 2006).

Tenure type describes the nature of the legal right a householder has to occupy the dwelling in which they live (ABS, 2000a). In Australia, private home ownership is the dominant tenure type. At the 2011 Census, 68% of non-Aboriginal households owned their home, either outright (33%) or with a mortgage (35%), and less than a third (29%) were renting in some capacity (AIHW, 2014c). Aboriginal households are much less likely to own their home outright (11%) or be paying off a mortgage (25%) and are instead much more likely to be renting (59%). Aboriginal households are also six times as likely to be renting their home from a social housing provider as other Australian households (26% vs 4% respectively) (AIHW, 2014c). That said, home ownership rates are higher for Aboriginal people in urban than remote areas, with rates slowly rising amongst a relatively small but growing number of professional and middle-income Aboriginal households (Lahn, 2013, Langton, 2012).

As noted by Bentley et al, tenure type has particular significance in Australia where, 'there is a long history of a preference for home ownership, while private rental is widely regarded as a tenure of transition towards homeownership and social housing is solidly seen as a welfare 'safety net' for those unable to own or rent in the private market.' p5 (Bentley, Pevalin et al., 2015, p. 5).

Home ownership in Australia brings many social and financial benefits but is not an option available to everyone (Biddle, 2012b). In qualitative research with Aboriginal residents of Western Sydney, participants described social housing as the only feasible tenure type for many urban Aboriginal people, as neither home ownership nor private rental were financially accessible and additional barriers such as racial discrimination were experienced in the private rental market (Andersen, Williamson et al., 2016). While social housing was generally described as a desirable tenure type for the relative stability and affordability it offered, participants living in social housing reported poor

dwelling conditions (Andersen, Williamson et al., 2016). These reports accord with existing evidence which suggests that tenure type and landlord type are associated with significant differences in housing conditions in both Aboriginal and general populations (Baker, Lester et al., 2016, Department of Social Services, 2015, Sartbayeva, 2016, Silburn, Zubrick et al., 2006).

The limitations of existing urban Aboriginal housing data sources include the under-identification of Aboriginal people in population surveys (ABS, 2012, AIHW, 2014c), small urban sub-populations in the two main Aboriginal child health studies that include housing questions (Silburn, Zubrick et al., 2006, Thurber, Banks et al., 2015) and varying levels of detail about housing conditions (Brandrup, 2013). For instance, in one of these studies, only three housing variables were used: carer response to, 'in the last year have you felt too crowded where you live, moved house or had housing problems' (y/n) ; 'overcrowding', (more than two persons per bedroom); 'home needs major repairs' (y/n) (Brandrup, 2013). These measures were described as insufficiently precise (Brandrup, 2013). More detailed information about the type and number of housing problems can be important when examining the interactions between housing and health (Bailie, Stevens et al., 2010, Baker, Beer et al., 2017, Brandrup, 2013).

Understanding the prevalence and distribution of the particular housing problems facing urban Aboriginal people is vital for informing housing and health policy aiming that aims to close the gap on Aboriginal disadvantage.

This paper aims to quantitatively describe the housing situations of families participating in the Study of Environment on Aboriginal Resilience and Child Health (SEARCH), the largest urban Aboriginal child health cohort study ever conducted in Australia. Phase one SEARCH data are used to examine cross-sectional associations, firstly between sociodemographic factors and tenure type, then between tenure type and specific housing problems, adjusting for relevant sociodemographic factors.

4.7 Methods

4.7.1 Sampling strategy

SEARCH is investigating the causes of health and illness in urban Aboriginal children, with a particular focus on the health priorities identified by participating Aboriginal communities: infectious disease; otitis media; mental health; injury; developmental delay; obesity; and risk factors for chronic disease (The SEARCH Investigators, 2010). SEARCH is being conducted in partnership with four Aboriginal Community Controlled Health Services (ACCHS) located in urban and large regional centres in the state of New South Wales (NSW): Mount Druitt (Aboriginal Medical Service Western Sydney); Campbelltown (Tharawal Aboriginal Corporation); Wagga Wagga (Riverina Medical and Dental Aboriginal Corporation), and Newcastle (Awabakal Ltd.) (The SEARCH Investigators, 2010).

Aboriginal children aged 0-17 years and their parents or caregivers were recruited through their local Aboriginal Community Controlled Health Services (ACCHS) between 2008 and 2011. All attending Aboriginal children were eligible to participate in the Phase One survey if their parent or caregiver (hereafter carer) was aged 16 years or over and was willing to provide contact information for follow up interviews. Carers of eligible Aboriginal children did not have to be Aboriginal. Families were invited to participate in SEARCH when presenting at a participating ACCHSs by an Aboriginal research officer, or informed about the study by their doctor or health worker (The SEARCH Investigators, 2010). No response rate data were kept. The SEARCH cohort will be followed for twenty years, funding permitting, with data collected on all outcomes and exposures – including housing – every five years, as outlined in the study protocol (The SEARCH Investigators, 2010). The sample for the current study includes all carers who completed a survey about their housing during Phase One of SEARCH.

4.7.2 Ethical approvals

SEARCH is a partnership between researchers, ACCHSs and the Aboriginal Health and Medical Research Council (AH&MRC) the peak body for ACCHSs in NSW. The study was approved by the ethics committees of the Aboriginal Health and Medical Research

Council of New South Wales (reference 586/06) and of the University of Sydney (reference, 12-2003/9429).

4.7.3 Measures

SEARCH carers completed a comprehensive survey about their children's physical and mental health, development, nutritional intake and exercise habits. Carers also completed a questionnaire about themselves covering a range of demographic, social, lifestyle and environmental factors, including their housing (The SEARCH Investigators, 2010) (see Appendix E). Housing questions were drawn from several established sources, including the NATSISS, WAACHS, Australian Housing Survey and New South Wales Child Health Survey, or developed specifically for SEARCH in consultation with Aboriginal community leaders. No existing self-report housing questionnaires were considered appropriate for unaltered use in an urban Aboriginal context.

Tenure type: Three main tenure type categories are examined in these analyses: own/mortgage (or 'owned'), private rental and social housing (See Appendix E). Owned homes include those either owned outright or with a mortgage currently being paid by the carer or any usual member of the household. Private rental homes are rented through a real estate or other private tenancy agreement. Social housing homes are those rented from any social housing provider, including mainstream public housing, state owned and managed Indigenous housing or any community housing provider, Aboriginal or non-Aboriginal.

Other Housing Variables: Survey questions about housing mobility, household size, crowding, affordability, dwelling type and dwelling quality have been categorised for analysis as per Appendix E. Housing mobility is conceptualised in various ways in the literature (Dockery and Colquhoun, 2012). In this study, housing mobility relates to moves between dwellings but not necessarily geographical area. Crowding is a complex construct to quantify in cross-cultural contexts (Memmott, Birdsall-Jones et al., 2012) and is measured disparately in existing Aboriginal health studies (Bailie, Stevens et al., 2010, Brandrup, 2013, Silburn, Zubrick et al., 2006). SEARCH quantifies several dimensions of household size, occupancy level and crowding, including carer subjective

report of feeling crowded and the objective measure persons per bedroom, used as a continuous ratio and as a binary measure. Homes with more than two persons per bedroom (PPB) are considered crowded as this violates the first condition of the Canadian National Occupancy Standard (Brandrup, 2013, Canadian Mortgage and Housing Corporation, 1991, Gray, 2001). The presence of specific physical dwelling problems was reported by carers within eight key domains: structural problems, major electrical problems, major plumbing problems, damp and mildew, poor physical security, vermin, inadequate temperature control and the absence of functioning smoke alarm. A tally of the total number of physical dwelling problem domains was created, with each home receiving a score of 0-8; this was examined as a binary exposure (3+ physical dwelling problems indicating poor physical dwelling conditions) and separately as numeric score (Silburn, Zubrick et al., 2006).

4.7.4 Statistical analysis

Sample characteristics are presented as frequencies and percentages or medians and quartiles, as most numeric measures were non-normally distributed. Regression analyses were conducted to examine the relationships between tenure type, housing conditions and socio-economic circumstances. Firstly, multinomial logistic regression models were used to calculate the associations between sociodemographic covariates and tenure type, as this dependent variable had three nominal categories: social housing; private rent; and own/mortgage. The adjusted Odds Ratios of living in each of the three tenure types were calculated for each carer sociodemographic covariate (age, sex, Aboriginality, ACCHS, employment status, qualifications, fortnightly income), adjusting for all sociodemographic covariates to estimate independent associations (Table 1).

Secondly, a series of generalised linear models were used to estimate the adjusted Prevalence Ratios of having each housing characteristics (outcome variable) by tenure type, adjusting for age, sex, ACCHS, Aboriginality and income (Tables 2 and 3). Analyses were conducted firstly with ownership, then private rental as the referent group to specifically examine differences between private rental and social housing, a potentially policy-relevant query. Prevalence Ratios were calculated in favour of Odds Ratios where

possible, as they provide a more conservative estimation of effect size where event outcomes are common (>10%) (Zou, 2004), which was the case for most housing variables. In the case of vermin and the categorical 'number of houses lived in' variable, binary logistic regression models were instead performed due to issues with convergence. Hence the associations reported for vermin and 4+ homes lived in are adjusted Odds Ratios, as marked in Table 3. Univariate analyses were conducted with all available cases and complete case analysis was conducted with multivariable modelling. All analyses were conducted in SPSS 22.0 (IBM SPSS Statistics for Windows).

4.8 Results

4.8.1 Participants

Of the 627 SEARCH carers who completed the carer survey, 600 (96%) provided data on their housing and tenure type and were included in the analyses. There were no statistically significant demographic differences between carers who provided housing data and those who did not. The 600 participants in the current study were the carers of 1406 SEARCH children aged between 0-17 at the time of recruitment.

The majority of SEARCH carers were female (91%) (Table 1) and most identified as Aboriginal (78%). Median carer age was 33 years (Q1 27, Q3 39). A total of 30% of carers were employed (full time or part time), 54% performed home duties, 13% were unemployed or unable to work. Most had no formal qualifications (52%).

4.8.2 Tenure type

Most SEARCH carers lived in some form of social housing (60%), with 21% renting privately and 19% in homes owned by a usual member of the household (3.3% owned outright and 16% being paid off) (Table 1). Income was substantially associated with tenure type; those in the lowest income bracket had 7.33 (95%CI 2.95, 18.16) times the odds of living in social housing rather than an owned home, compared to those in the highest income bracket. Similarly, those carers who were not working (OR 3.20, 95%CI 1.16, 8.83) or who performed home duties (OR 3.50, 95%CI 1.85, 6.65) had significantly higher odds of living in social housing than owned homes, compared with those who were employed.

For every additional 10 years of age, carers had significantly lower odds of living in private rent (OR 0.51, 95%CI 0.36, 0.71) or social housing (OR 0.70, 95%CI 0.52, 0.93) compared to an owned home. After adjusting for all other demographic factors, Aboriginal carers had higher odds than non-Aboriginal carers of living in social housing rather than an owned home (OR 4.17, 95%CI 2.25, 7.74) and of living in social housing rather than in a privately rented home (OR 2.79 (95%CI 1.60, 4.86). There was no significant difference in the odds of owning and renting privately for Aboriginal versus non-Aboriginal carers (Table 1). There was some significant variation in tenure type by ACCHS; carers recruited from ACCHS D had over four times the odds of living in social housing rather than an owned home (OR 4.44, 95%CI 2.03, 9.73) when compared with carers from ACCHS A.

Table 4.1: Sociodemographic characteristics of carers who completed Phase One SEARCH carer survey: prevalence and adjusted Odds Ratio by tenure type ^h

Characteristic	Overall ^{a c}	Prevalence by tenure type (%)			aOR (95% CI) ^h		
		Own/ Mortgage _{b c}	Private Rent _{b c}	Social Housing _{b c}	Social Housing vs Own/Mortgage	Social Housing vs Private rent	Private Rent vs Own/Mortgage
Total	600	116 (19%)	125 (21%)	359 (60%)			
Gender							
Male	9.3%	12%	9.6%	8.4%	^e	^e	^e
Female	91%	88%	90%	92%	1.02 (0.44, 2.37)	1.03 (0.45, 2.36)	0.98 (0.39, 2.52)
Age (years) ^{d ***}	33 (27, 39)	35 (30, 43)	31 (26, 37)	33 (27, 39)	0.70 (0.52, 0.93) * ^f	1.37 (1.04, 1.80) * ^f	0.51 (0.36, 0.71) *** ^f
Aboriginal Status ***							
Non-Aboriginal	22%	37%	30%	15%	^e	^e	^e
Aboriginal &/or Torres Strait Islander	78%	64%	70%	86%	4.17 (2.25, 7.74) ***	2.79 (1.60, 4.86) ***	1.50 (0.80, 2.80)
Health Service ***							
ACCHS A	24%	33%	22%	22%	^e	^e	^e
ACCHS B	21%	23%	34%	16%	2.05 (0.94, 4.50)	0.50 (0.25, 0.98) *	4.12 (1.83, 9.30) **
ACCHS C	27%	24%	21%	30%	2.02 (0.97, 4.24)	1.27 (0.64, 2.52)	1.59 (0.70, 3.62)
ACCHS D	28%	20%	24%	32%	4.44 (2.03, 9.73) ***	1.59 (0.80, 3.13)	2.80 (1.18, 6.66) *
Employment Status ***							
Employed	30%	54%	38%	19%	^e	^e	^e
Studying	3.5%	3.4%	4.0%	3.4%	2.22 (0.60, 8.28)	2.38 (0.70, 8.14)	0.93 (0.22, 3.96)
Home duties	54%	34%	48%	63%	3.50 (1.85, 6.65) ***	2.11 (1.19, 3.75) *	1.66 (0.84, 3.30)
Not working ^g	13%	8.6%	11%	15%	3.20 (1.16, 8.83) *	2.18 (0.94, 5.03)	1.47 (0.48, 4.48)
Qualifications *							
Bachelor/post graduate degree	7.5%	15%	11%	3.9%	^e	^e	^e
Trade, certificate, diploma	41%	63%	47%	31%	0.86 (0.32, 2.33)	1.33 (0.49, 3.66)	0.65 (0.24, 1.74)
None	52%	23%	42%	65%	3.50 (1.21, 10.15) *	2.45 (0.87, 6.91)	1.43 (0.48, 4.28)
Fortnightly Income ***							
\$2000+	9.8%	26%	11%	4.4%	^e	^e	^e
\$800-1999	43%	52%	49%	37%	2.95 (1.27, 6.86) *	1.33 (0.54, 3.29)	2.21 (0.95, 5.17)
\$0-799	48%	22%	41%	58%	7.33 (2.95, 18.16) ***	1.95 (0.78, 4.89)	3.75 (1.47, 9.59) **

^a Percentage of carers overall with each characteristic; ^b Percentage of carers within each tenure type with each characteristic (column percentages) ; ^c Percentages may not add up to 100 due to rounding; ^d Median (Q1, Q3); ^e Referent group; ^f Odds of living in tenure type are for each additional 10 years of age; ^g Not working; included carers who reported being unemployed, unable to work or retired ; ^h Adjusted for all demographic characteristics: sex, age, ATSI Status, ACCHS, employment status, qualifications and income; * p<0.05 ** p<0.01 *** p<0.001.

4.8.3 Housing and household characteristics

Tables 2 and 3 show housing characteristics reported by SEARCH carers and the associations between each housing factor and tenure type, after adjustment for age, sex, ACCHS, Aboriginality and income. Most dwellings were houses (94%) rather than apartments (6.5%). Small cell counts prevented statistical analysis of difference by tenure type, though the proportion of apartment-dwellers in private rental was highest at 12%, with apartments accounting for only 1% of owned homes and 7% of social housing homes.

4.8.4 Mobility

Households renting privately had lived in their homes for fewer years (median 1.1yrs) than those in social housing (median 3.7yrs) and owned homes (median 5.0yrs) (Table 2). Likewise, SEARCH children in private rental at the time of the survey had lived in significantly more homes than those in owned homes or social housing. A SEARCH child living in private rental had 3.31 times the odds (95%CI 2.14, 5.13) of having lived in 4+ houses since birth compare to those living in owned homes. One in eight SEARCH carers reported that they had been forced to move out in the past twelve months; this did not vary significantly by tenure type.

Table 4.2: Housing and household characteristics reported by SEARCH carers and adjusted Prevalence Ratio of each characteristic by tenure type ^g

Characteristic	Overall ^{a c}	Prevalence by tenure type n (%)			aPR (95% CI) ^g		
		Own/ mortgage ^{b c}	Private Rent ^{b c}	Social Housing ^{b c}	Social Housing vs Own/mortgage ^e	Social Housing vs Private rent ^e	Private Rent vs Own/mortgage ^e
Total	600	116 (19%)	125 (21%)	359 (60%)			
Dwelling structure [*]							
House	94%	99%	89%	94%			
Apartment	6.5%	0.9%	12%	6.5%			
Years in current dwelling *** ^d	3.0 (1.0, 7.0)	5.0 (1.4, 10.0)	1.1 (0.5, 2.7)	3.7 (1.0, 7.3)	0.84 (0.67, 1.05)	2.28 (1.72, 3.04) ***	0.37 (0.27, 0.49) ***
Forced to move out in past year	12%	9.5%	14%	13%	0.94 (0.47, 1.89)	0.88 (0.51, 1.55)	1.07 (0.49, 2.34)
Affordability problems ** ^f	32%	39%	40%	27%	0.65 (0.48, 0.91) **	0.61 (0.46, 0.82) **	1.07 (0.77, 1.49)
No. of usual residents ** ^d	5 (4, 6)	5 (4, 6)	4 (3, 6)	5 (4, 6)	1.02 (0.93, 1.12)	1.12 (1.03, 1.23) **	0.91 (0.82, 0.99) *
No. of bedrooms ***							
0-2	6.7%	3.4%	19%	3.4%			
3	59%	45%	54%	65%			
4+	35%	52%	27%	32%			
Median *** ^d	3 (3, 4)	4 (3, 4)	3 (3, 4)	3 (3, 4)	0.96 (0.91, 1.01)	1.10 (1.04, 1.16) ***	0.87 (0.82, 0.93) ***
People Per Bedroom (PPB) ^d	1.3 (1.0, 1.7)	1.3 (1.0, 1.7)	1.5 (1.0, 1.8)	1.3 (1.0, 1.7)	1.02 (0.94, 1.11)	0.97 (0.89, 1.06)	1.05 (0.96, 1.16)
> 2 People Per Bedroom (CNOS) ^h	9.0%	6.9%	9.8%	9.4%	0.97 (0.45, 2.37)	0.95 (0.50, 1.92)	1.03 (0.43, 2.60)
Felt crowded in past 12 months	30%	21%	30%	33%	1.26 (0.93, 1.89)	1.07 (0.78, 1.50)	1.19 (0.76, 1.92)
Home too small [*]	42%	35%	35%	46%	1.33 (1.00, 1.83)	1.39 (1.06, 1.87) *	0.96 (0.67, 1.39)
Home too big	1.7%	0.9%	1.6%	2.0%			
Children of carers in study	1406	244 (17%)	276 (20%)	886 (63%)			
Homes lived in since birth *** ^d	2 (1, 4)	2 (1, 3)	3 (2, 5)	2 (1, 4)	1.19 (1.05, 1.35) **	0.82 (0.75, 0.90) ***	1.45 (1.27, 1.67) ***
1-3 homes	65%	74%	54%	67%	^e	^e	^e
4+ homes *** ⁱ	35%	26%	46%	33%	1.87 (1.25, 2.78) **	0.56 (0.41, 0.77) ***	3.31 (2.14, 5.13) ***

^a Percentage of households with each housing characteristic overall; ^b Percentage of households within each tenure type with each housing characteristic;

^c Percentages may not add up to 100 due to rounding; ^d Median (Q1, Q3); ^e Referent group *p<0.05 **p<0.01 ***p<0.001;

^f Affordability problems if reported yes to rent, rates or mortgage too high; ^g Adjusted for age, sex, ACCHS, Aboriginality and income; ^h Households considered crowded as per the first Canadian National Occupancy Standard, having more than 2 people per bedroom; ⁱ Adjusted Odds Ratio not Prevalence Ratio.

4.8.5 Affordability

Affordability problems were reported by a high proportion of carers and while income was not significantly associated with housing affordability problems, tenure type was (Table 2). Those in social housing were less likely to report housing affordability problems compared to those in their own homes (PR 0.65 95%CI 0.48, 0.91) and renting privately (PR 0.61, 95%CI 0.46, 0.82).

4.8.6 Household size, density and crowding

Overall, 30% of carers reported having felt too crowded where they live, with no significant difference by tenure type. Very few carers reported that their home was too big (1.7%, small cell counts prohibited modelling), while 42% of carers reported that their home was too small. Those in social housing were more likely to report that their home was too small than those renting privately (PR1.39, 95%CI 1.06, 1.87).

SEARCH homes had a median of 3 bedrooms and 5 people who normally slept there, with a median household density of 1.3 Persons Per Bedroom (PPB). Measures of household density, PPB and crowding according to the CNOS, did not differ significantly according to tenure type (see Table 2). Overall, 9% of SEARCH households failed the first occupancy standard of the CNOS, having more than two persons per bedroom.

Table 4.3: Physical dwelling problems reported by SEARCH carers and adjusted Prevalence Ratio of each characteristic by tenure type ^f

Housing Problem Present (Yes)	Overall ^{a c} n=600 (%)	Prevalence by tenure type n (%)			aPR (95% CI) ^f		
		Own/ mortgage ^{b c} n=116 (%)	Private Rent ^{b c} n=125 (%)	Social Housing ^{b c} n=359 (%)	Social Housing vs Own/mortgage ^e	Social Housing vs Private rent ^e	Private Rent vs Own/mortgage ^e
Structural problems ^{**}	40%	23%	32%	48%	1.73 (1.23, 2.60) ^{**}	1.30 (0.99, 1.78)	1.34 (0.88, 2.09)
Sinking/moving foundations [*]	20%	11%	13%	26%	1.80 (1.06, 3.36) [*]	1.75 (1.08, 3.07) [*]	1.03 (0.51, 2.11)
Major cracks in walls/floors [*]	29%	14%	23%	35%	1.85 (1.17, 3.16) [*]	1.27 (0.91, 1.87)	1.45 (0.85, 2.60)
Sagging floors [*]	12%	4.4%	8.3%	16%	3.22 (1.40, 9.37) [*]	1.69 (0.89, 3.64)	1.90 (0.67, 6.14)
Walls or windows not straight ^{**}	17%	7.9%	7.4%	24%	2.66 (1.44, 5.66) ^{**}	2.78 (1.52, 5.85) ^{**}	0.96 (0.39, 2.38)
Wood rot/termite damage ^{**}	17%	4.4%	9.9%	24%	5.72 (2.39, 18.75) ^{**}	2.11 (1.22, 4.01) [*]	2.71 (0.97, 9.53)
Damp and Mildew ^{***}	34%	13%	28%	43%	2.90 (1.83, 5.00) ^{***}	1.53 (1.12, 2.18) [*]	1.89 (1.11, 3.41) [*]
Rising damp ^{***}	19%	6.3%	16%	25%	3.36 (1.68, 7.99) ^{**}	1.44 (0.91, 2.41)	2.34 (1.06, 5.87)
Damp/mildew on walls, ceilings, windows ^{***}	33%	12%	27%	42%	2.92 (1.81, 5.17) ^{***}	1.52 (1.10, 2.19) [*]	1.92 (1.10, 3.56) [*]
Major electrical problems	13%	5.3%	8.3%	17%	2.39 (1.11, 6.24)	1.86 (0.98, 4.00)	1.29 (0.48, 3.76)
Major plumbing problems	16%	5.3%	12%	20%	2.30 (1.10, 5.91)	1.20 (0.71, 2.19)	1.92 (0.80, 5.27)
No functioning smoke alarm installed [*]	6.5%	7.8%	11%	4.3%	0.32 (0.13, 0.83) [*]	0.37 (0.16, 0.84) [*]	0.85 (0.37, 2.11)
Needs to be more secure ^{***}	39%	12%	28%	51%	3.30 (2.03, 5.96) ^{***}	1.67 (1.24, 2.36) ^{**}	1.98 (1.13, 3.72) [*]
Vermin (cockroaches, mice or other) ^{*** g}	43%	20%	34%	54%	4.24 (2.39, 7.52) ^{***}	2.49 (1.53, 4.06) ^{***}	1.70 (0.90, 3.25)
Temperature Control ^{**}	27%	9.5%	25%	34%	3.26 (1.78, 6.83) ^{**}	1.30 (0.92, 1.92)	2.50 (1.29, 5.43) [*]
Unable to make home warm enough in winter [*]	18%	7.8%	16%	22%	2.05 (1.10, 4.33) [*]	1.26 (0.82, 2.05)	1.63 (0.80, 3.61)
Unable to make home cool enough in summer ^{***}	22%	6.9%	18%	28%	3.95 (1.90, 10.10) ^{**}	1.46 (0.95, 2.37)	2.71 (1.20, 7.23) [*]
No. of physical dwelling problems ^{*** d h}	1 (0, 4)	0 (0, 1)	1 (0, 3)	2 (1, 4)	2.29 (1.63, 3.21) ^{***}	1.46 (1.18, 1.80) ^{***}	1.57 (1.09, 2.27) [*]
0	31%	56%	34%	22%	^e	^e	^e
1	19%	22%	22%	17%	^e	^e	^e
2	13%	9.5%	15%	13%	^e	^e	^e
3 or more ⁱ	37%	12%	29%	49%	3.19 (1.97, 5.73) ^{***}	1.49 (1.11, 2.08) [*]	2.15 (1.24, 4.01) [*]

^a Percentage of households with each housing characteristic overall; ^b Percentage of households within each tenure type with each housing characteristic; ^c Percentages may not add up to 100 due to rounding; ^d Median (Q1, Q3); ^e Referent group; ^f adjusted for age, sex, ACCHS, Aboriginality and income; ^g Adjusted Odds Ratio not Prevalence Ratio; ^h No. of physical dwelling problem domains: structural, damp, electrical, plumbing, no smoke alarm, security, vermin and temperature control; ⁱ Binomial category 3+ physical housing problems vs 0-2 problems;

*p<0.05 **p<0.01 ***p<0.001.

4.8.7 Physical dwelling conditions

Physical housing problems were most prevalent for those in social housing, who reported a median of 2 problem domains (Q1 1, Q3 4), followed by those in private rental (1 (Q1 0, Q3 3)), while those in owned/mortgaged homes reported the fewest problems (0 (Q1 0, Q3 1) (Table 3). Social housing tenants were more than three times as likely to report 3+ dwelling problem domains than those in their own homes (PR 3.19, 95%CI 1.97, 5.73). Those in private rental were 2.15 (95%CI 1.24, 4.01) times as likely to report 3+ problem domains than those in owned homes.

Vermin was the most commonly reported dwelling problem; 43% of carers reported problems with cockroaches, mice or other vermin. Those in social housing had 4.24 (95%CI 2.39, 7.52) times the odds of reporting a vermin problem than those in their own home (Table 3).

Forty percent of carers reported at least one major structural problem with their dwelling, the most common of which were major cracks in the walls or floors (29%) and sinking or moving foundations (20%). Again, each form of structural problem was significantly more likely to be reported by those in social housing than those in their own home; some were also significantly more likely for those in social housing than those in private rental.

The need for housing to be made more secure was reported by 39% of carers, with those in social housing 3.30 (95%CI 2.03, 5.96) times as likely to report this problem as those in their own home, and 1.67 (95%CI 1.24, 2.36) times as likely as those in private rental.

Damp and mildew was also prevalent in SEARCH households (34%), but disproportionately so for those in social housing (43%) compared to those in their own home (13%, PR 2.90, 95%CI 1.83, 5.00) or private rental (28%, PR 1.53, 95%CI 1.12, 2.18). Those in private rental were also more likely to report damp and mildew than those in owned homes (PR = 1.89, 95%CI 1.11, 3.41).

Over a quarter of carers reported some problem with temperature control (27%). Those in social housing were twice as likely to report being unable to make their homes warm enough in winter (PR 2.05, 95%CI 1.10, 4.33) and 3.95 (95%CI 1.90, 10.10) times as likely to be unable to make their homes cool enough in summer than those in owned homes.

Those in social housing reported the lowest rates of broken or absent smoke alarms (4.3%), the only measure of physical housing function in which social housing was reported to perform better than other tenure types. Both carers in private rental and home ownership were less likely to report having a functioning smoke alarm than those in social housing (PR 0.32, 95%CI 0.13, 0.83 and PR 0.37, 95%CI 0.16, 0.84) respectively.

4.8.8 Associations between other sociodemographic variables and housing factors

Overall, tenure type had more substantial and significant independent associations with housing outcomes than other sociodemographic variables in the models. There were some exceptions, however; the most notable of which was the association between income and home heating, with those in the lowest income bracket 10 times as likely as those in the highest income bracket to report being unable to keep their home warm enough in winter (PR 10.0 95%CI 2.3, 17.6). Those in the lowest income bracket were also 2.5 times as likely to report feeling crowded than those in the highest bracket (PR 2.5 95%CI 1.2, 6.2). Carers with the lowest household income also reported more physical dwelling problems than those in the highest income bracket (PR 1.6 95%CI 1.2, 2.1). Yet income was not significantly associated with housing affordability problems, the ability to keep home cool enough in summer or objective measures of household crowding. Carer age was associated with the number of years lived in current home, although even an additional decade of age (PR 1.5, 95%CI 1.3, 1.6) did not have as substantial an effect as tenure type.

4.9 Discussion

Housing problems were common in this large sample of urban Aboriginal families. The pattern of variance in housing circumstances according to tenure type is striking and paints a clear picture of the pressure points of each tenure type. Home ownership was associated with the fewest physical dwelling problems and the most stable housing;

however, housing affordability problems were significantly more prevalent than for families in social housing. Conversely, social housing tenure was associated with the lowest prevalence of affordability problems and similar occupancy duration to home ownership, but a significantly higher number of physical dwelling problems. In many respects, those in private rental experienced 'the worst of both worlds'. Private renters were just as likely as those in their own home to report housing affordability problems yet they reported significantly more physical dwelling problems than those living in their own homes and the most housing instability. These findings generally comport with what is known about the relationships between housing tenure type and other forms of housing need.

Consistent with international literature, home ownership amongst SEARCH participants was associated with life course and socioeconomic factors and increased with both age and income (Crawford and Biddle, 2016). Carers in social housing were also significantly older than those in private rental, perhaps reflecting the long waiting lists for social housing, which can be over 10 years in many parts of urban NSW (NSW Government). There was no significant difference in income for those in private rental versus social housing, which may reflect the growing and substantial pockets of concentrated poverty in Australia's private rental market given the contraction of the social housing sector in recent decades (Hulse, Burke et al., 2012). State housing providers recently estimated that they are only able to meet 44% of social housing need in NSW (NSW Audit Office, 2012). Indeed in a qualitative study with Aboriginal people in Western Sydney, several families reported paying unaffordable rent in the private market to avoid homelessness while awaiting social housing (Andersen, Williamson et al., 2016). The proportion of SEARCH households living in social housing (60%) is slightly higher than in other studies of Aboriginal child health (50%) (Department of Social Services, 2009, Silburn, Zubrick et al., 2006) and more than double that of Aboriginal households in the 2011 Census (26%) (AIHW, 2014c, Department of Social Services, 2009, Silburn, Zubrick et al., 2006). However, the most stark contrast is observed in relation to non-Aboriginal Australian households, of whom 4% were renting from a social housing provider in the 2011 Census (AIHW, 2014c). The proportion of SEARCH households in

home ownership (19%) is also lower than that of Aboriginal households in the 2011 Census (36%) (ABS, 2016).

Around a quarter (25%) of SEARCH children had lived in five or more homes since birth. Similar rates of high residential mobility were found amongst urban families participating in WAACHS (29%) (Silburn, Zubrick et al., 2006). As has been observed elsewhere (ABS, 2000a, Department of Social Services, 2015, Taylor and Bell, 2012), housing instability was more common amongst those renting privately than those living in social housing or in their own home. While this is to be expected given the tenuous right to occupancy offered by Australia's private rental system (Hulse, Burke et al., 2012), the implications for SEARCH children in private rental are concerning.

Frequent residential moves in childhood are linked with poorer child health, social and emotional wellbeing and educational outcomes; and the long-term negative health and wellbeing effects of childhood residential instability into adulthood have been demonstrated in longitudinal studies in Australia and internationally (Cotton, 2016, Dockery, 2013, Jellayman and Spencer, 2008, Mok, Webb et al., 2016, Tseliou, Maguire et al., 2016, Webb, Pedersen et al., 2016).

While residential moves can occur when families choose to move to different locales for employment or for positive housing reasons, such as entering home ownership, the experience of lower income families is often characterised by a lack of choice and control (Andersen, Williamson et al., 2016, Silburn, Zubrick et al., 2006, Stone, Parkinson et al., 2016). The relatively high proportion of SEARCH families who report being forced to move from where they live in the past 12 months is evidence of unwanted mobility. Housing mobility is often associated with adverse family events such as separation or family violence, though existing research indicates that the main drivers for Indigenous mobility, particularly in urban areas, are housing-related (Department of Social Services, 2015). That is to say, the main reasons families move is to seek more appropriate housing (for instance leaving crowded, unaffordable or poor quality dwellings), being evicted or asked to leave by landlords (Biddle, 2012c, Department of Social Services, 2015). This would suggest that housing policy and economic interventions can

potentially have a particularly significant impact on the housing instability of urban Aboriginal families.

SEARCH households had more usual residents yet a similar number of bedrooms to the average non-Aboriginal Australian household (AIHW, 2014c, Biddle, 2011b), resulting in higher household density rates. As SEARCH households consist only of families with children, it is perhaps more meaningful to compare them with other households with children; LSIC households had a similar number of usual residents (mean of 5.2), while a representative sample of non-Aboriginal Australian households with children had fewer residents (mean of 4.4) (Department of Social Services, 2015). There are many reasons why Aboriginal households tend to be larger than non-Aboriginal households, including higher birth rates and other social and cultural factors; however, housing factors including attempts to cope with high housing costs, poor housing availability and the accommodation of homeless family and friends by have also been documented as drivers for large household size and crowding (Andersen, Williamson et al., 2016, Biddle, 2011b, Prout and Biddle, 2015).

The proportion of SEARCH households with more than two persons per bedroom (violating the first standard of the Canadian National Occupancy Standard (9.0%) is almost triple that of the general Australian population (3.4%), though it is lower than that observed in LSIC households (17%) and Aboriginal households in the 2011 Census (12.9%) (AIHW, 2014c, Sartbayeva, 2016). These differences are likely to be partly due to SEARCH's urban population, as crowding is known to increase substantially with increased relative isolation (AIHW, 2014c).

While significant differences in crowding by tenure type have been noted elsewhere (AIHW, 2014c, Department of Social Services, 2015, Silburn, Zubrick et al., 2006), this was not the case amongst SEARCH participants. This accords with existing evidence that affordability issues in the private housing market can squeeze Aboriginal families into homes too small for their needs (Stone, Parkinson et al., 2016) and that even households with good incomes and stable housing situations can experience crowding when called on to host family and friends in need (Andersen, Williamson et al., 2016).

The sizeable discrepancy between the proportion of households who reported having felt too crowded (30%) or that their house was too small (42%) and the relatively low rates of crowding as defined by the CNOS (9%) is a finding of interest. For this and other reasons, crowding measurement is being further scrutinised by the research team elsewhere. The relationship between crowding and health and wellbeing for Aboriginal Australians is complex; while some studies have found mixed or positive associations between crowding and social and emotional wellbeing (Biddle, 2011b, Silburn, Blair et al., 2007), many others show clear associations between crowding and infectious disease, poor school attendance and performance, family violence and risk of eviction (Brandrup, 2013, Silburn, 2014, Silburn, Zubrick et al., 2006).

The high prevalence of housing affordability problems reported here accords with the high cost of housing in Australia, particularly in metropolitan areas. SEARCH carers living in social housing were the least likely to report housing affordability problems. While most low income Australian households in private rental are eligible for Commonwealth Rent Assistance (government contributions towards rental costs) the amounts provided have been described as insufficient to make housing affordable for many low income families (Andersen, Williamson et al., 2016, Stone, Parkinson et al., 2016).

Housing affordability stress has been shown to affect mental health over and above general financial hardship and can also affect health through reduced funds for nutritious food, access to health care and numerous other requirements (Mason, Baker et al., 2013). There is evidence that those renting privately in Australia spend the highest proportion of their income on housing costs (ABS, 2000a) and experience more psychological distress than home purchasers experiencing the same levels of housing affordability stress (Bentley, Pevalin et al., 2015, Mason, Baker et al., 2013). Thus, SEARCH households in private rental may experience greater negative impacts due to housing affordability problems than home owners. While this may be due to inherent differences in the characteristics of owners and renters and not necessarily causally related to tenure, the benefits associated with home ownership, including control, stability, prestige and wealth-generation and the relatively weak private rental tenancy

protections available in Australia are likely to play a role (Bentley, Pevalin et al., 2015, Biddle, 2011b, Mason, Baker et al., 2013, Stone, Parkinson et al., 2016).

Poor physical dwelling conditions have traditionally been the main focus of research into the associations between housing and health (Howden-Chapman, Matheson et al., 2007, Thomson, Thomas et al., 2013), particularly in remote Aboriginal communities where significant associations have been found (Bailie, Stevens et al., 2010). The prevalence of major structural problems in SEARCH households was notably higher than in the most recent national survey of Australian housing, the 1999 Australian Housing Survey (AHS)(ABS, 2000a). Major cracks in walls and floors, the most prevalent problem in the AHS, was reported by 7% of respondents, compared to 29% of SEARCH households. Similar discrepancies are noted with other problems including sinking or moving foundations (AHS 5%, SEARCH 20%) and rising damp (AHS 5%, SEARCH 19%).

However, the proportions of major structural problems observed in SEARCH were similar to those in the NATSISS, where 25% of Aboriginal people in non-remote areas were living in a dwelling with major structural problems (ABS, 2016), and in the National *Social Housing Survey*, where major cracks in walls or floors were reported by 21% of mainstream public housing tenants and 33% of State Owned and Managed Indigenous Housing (SOMIH). Similarly, rising damp was reported by 20% of those in public housing and 29% of those in SOMIH (AIHW, 2013b).

These differences may largely be explained by the difference in tenure type between these study samples, just as the differences are explained by tenure type within in the current study. Fifty percent of LSIC participants in social housing reported that their homes needed repairs vs 30% of private renters and 19% of those in their own homes (Sartbayeva, 2016). And while WAACHS did not differentiate between those renting privately or from a social housing provider, households that were being rented had 2.5 times the odds of having three or more indicators of poor housing compared to households with a mortgage (Silburn, Zubrick et al., 2006). Aboriginal participants in a recent study described the social housing in Western Sydney as 'generally old and in poor condition' and reported experiencing difficulty obtaining repair and maintenance

services (Andersen, Williamson et al., 2016), which comports with a recent report from the NSW Audit Office about the inadequacy of current funds to maintain current social housing stock (NSW Audit Office, 2012, p. 2).

It is perhaps unsurprising that owner-occupied homes tend to be in better condition than other dwellings (Biddle, 2011b). This trend may reflect better access to economic resources or the greater incentive home owners have to maintain their dwelling (Biddle, 2011b). Incentive and capacity to maintain homes to an adequate standard is perhaps worth considering from a policy stance. The anomaly of smoke alarms being the only physical dwelling condition where social housing performed better than other tenure types may in part be due to the legal requirement for all NSW landlords to install and maintain smoke alarms. This points to the potential power of clear legislation regarding landlord responsibilities in improving housing conditions (University of Otago). It could also be argued that housing standards may play a role. In a recent report of social housing standards, a dwelling could be considered to be of an acceptable standard despite having neither a functioning toilet nor a bath/shower, so long as all other facilities (kitchen sink, laundry tub, fridge and others) were present (AIHW, 2013b). We argue that most Australians would not consider a dwelling without such essential facilities to be acceptable.

This study has several limitations. Firstly causal inference cannot be asserted from cross-sectional studies as the direction of influence cannot be proven (Bailie, Stevens et al., 2010). Also, as previously indicated, SEARCH families are not a representative sample of urban Aboriginal households in NSW (AIHW, 2014c). Thus these findings are best suited for internal comparisons and longitudinal analyses (The SEARCH Investigators, 2010, Thurber, Banks et al., 2015). Recruitment materials did not mention housing problems, so no specific bias is likely with regard to housing outcomes. Study findings are based on self-report survey data, not on the direct or objective observation of homes. There is some evidence to suggest that residents tend to underreport problems with their housing (Byles, Mackenzie et al., 2014) and that new home owners tend to underestimate the cost of repairs and maintenance their homes require (Smith, 1996). Lastly, the Phase One SEARCH survey did not gather data on the significant issue

of family homelessness; one in every 15 Indigenous children in Australia sought homelessness assistance in 2014-2015, most with a parent (Parayiwā and Tierney, 2016). That said, SEARCH offers a detailed account of the housing situations of a large sample of urban Aboriginal families and the current study findings have a number of policy implications.

Government decisions affect housing availability, affordability and conditions in myriad ways (Department of Prime Minister and Cabinet, 2014). Levers available to different levels of government include taxation, tenancy law, zoning law and the provision of various forms of direct housing assistance (Biddle, 2012b). Government policies have a particularly large effect on the housing circumstances of Aboriginal Australians, in part because of their overrepresentation as low-income renters either in social housing or as recipients of Commonwealth Rent Assistance (Biddle, 2012b). While this means that the aging of social housing stock, reduced funding for social housing maintenance and scaling back of social housing availability (Jacobs K, Atkinson R et al., 2010) has undoubtedly disproportionately affected Aboriginal households, it also means that they may potentially benefit greatly from programs to improve housing affordability, stability and quality, provided they are appropriately targeted and accessible for Aboriginal households (Milligan, Phillips et al., 2011b). There are many incentives for governments to act to improve housing for its citizens, with evidence that improved housing conditions decrease health and social services use and associated expenditures (Howden-Chapman, 2012, NSW Department of Health, 2010, Parsell, Petersen et al., 2016).

This study suggests that home ownership for Aboriginal households should be encouraged and assisted where possible and desirable, for example through existing Home Purchase Schemes, such as those available through Indigenous Business Australia or the NSW Aboriginal Housing Office. Nevertheless, some households may still struggle with housing affordability when paying a mortgage and new solutions may be required to support such households (Stone, Parkinson et al., 2016). Importantly though, home ownership is not an option for a significant proportion of the urban Aboriginal community (Andersen, Williamson et al., 2016, Milligan, Phillips et al.,

2011b), as is increasingly the case for a growing proportion of all low and middle-income Australians (Hulse, Burke et al., 2012). Social housing is an important tenure type for urban Aboriginal people, providing much needed, affordable and relatively stable housing. However, a second obvious implication of this study is the need for improved dwelling conditions in social housing (NSW Audit Office, 2012).

Thirdly, the apparent vulnerability of SEARCH households in private rental to multiple forms of housing disadvantage suggests the need for a variety of policy responses, including increasing the number of social housing dwellings to address high levels of unmet need (NSW Audit Office, 2012) and encouraging other forms of affordable housing accessible to urban Aboriginal people (Milligan, Martin et al., 2016). Our findings also support growing calls to strengthen Australian tenant protections around affordability, dwelling conditions and secure tenancy, all of which are weak by international standards (Hulse, Burke et al., 2012, Martin, 2017, Shaw, 2014). Such protections may include rent control, removal of 'without grounds' termination by landlords, better protections against racial discrimination and the enforcement of higher dwelling standards (Shaw, 2014). In New Zealand, one means of improving housing conditions in both social housing and private rental is the trial of a rental 'Warrant of Fitness', requiring rental properties to pass certain health and safety standards in much the same way that a car must to be allowed on the road (University of Otago). Improved dwelling conditions in social housing and increased social housing supply are both likely to require additional public funds to be invested in social housing. This has not been considered desirable in Australia for many decades, where social housing has a problematic public image (Birdsall-Jones, 2013, Jacobs K, Atkinson R et al., 2010). It is possible that as increasing numbers of middle class Australians are priced out of home ownership in metropolitan areas (Bentley, Pevalin et al., 2015), public awareness and support for social and affordable housing, along with the need for improved protections for renters in both the private and social housing sectors, may grow (Martin, 2017, Shaw, 2014).

Lastly, while tenure type is significantly associated with particular forms of housing disadvantage in this study and elsewhere, the fundamental drivers behind Aboriginal

housing disparity must also be kept in mind. Aboriginal people are less likely to own their own homes largely due to the ongoing effects of colonisation and dispossession, which includes intergenerational poverty, marginalisation, and ongoing racial discrimination in employment and housing markets (Andersen, Williamson et al., 2017a, Andersen, Williamson et al., 2016, Berman and Paradies, 2008). Thus efforts to improve housing disadvantage for Aboriginal people will also likely require cross-sectoral collaboration with the education, employment, justice and health sectors, along with programs to actively address racial discrimination (Berman and Paradies, 2008, Equal Opportunity Commission, 2011).

4.10 Conclusion

The high prevalence of housing problems in this large urban Aboriginal cohort suggest the need for public health, housing and other professionals to join with Aboriginal people and organisations in advocating for improved access to decent and affordable housing. The significant discrepancies in the housing problems reported by households in different tenure types suggest the potential need for differentiated policy responses.

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**CHAPTER 5: *STUDY FOUR*, HOUSING
CONDITIONS AND RECURRENT
GASTROINTESTINAL INFECTION IN URBAN
ABORIGINAL CHILDREN**

5.1 Preamble

Chapter 4 described the prevalence of a range of housing problems for SEARCH families and the distribution of these problems by tenure type. These findings closely comported with those reported in **Chapters 2** and **3**, where focus group participants said housing problems were common for urban Aboriginal people and that social housing provided affordable and stable accommodation but was of poor quality. Focus group participants also expressed the belief that housing problems such as crowding and poor dwelling conditions were contributing to infectious disease in urban Aboriginal communities, particularly for children. As noted in **Chapter 1**, as yet there is little evidence about whether and how housing conditions impact the health of urban Aboriginal households.

Study Four examines the associations between housing conditions (physical dwelling conditions and crowding) and gastrointestinal infection in SEARCH children. Data about a range of child health outcomes were collected through SEARCH, including respiratory, skin and ear infection; gastrointestinal infection was selected as the focus for this study due to the known associations between housing conditions and gastrointestinal infection for Aboriginal people in remote communities. Gastrointestinal infection is a common health problem that disproportionately affects Aboriginal children compared to non-Aboriginal children in NSW and across Australia (Carville, Lehmann et al., 2007, Falster, Banks et al., 2016, Yau, Lee et al., 2005). In an evaluation of Housing for Health, a housing improvement program conducted with thousands of Aboriginal households in rural and remote NSW, greater reductions in hospital admission rates were achieved for intestinal infection than any other health outcome (NSW Department of Health, 2010). There is also evidence that gastroenteric illness is associated with housing problems in a longitudinal study with a mixed cohort of remote and non-remote Aboriginal children (Brandrup, 2013), but these associations have not been examined in an exclusively urban population to date.

5.2 Copyright statement

I certify that this publication was a direct result of my research towards this PhD, and that reproduction in this thesis does not breach copyright regulations.

Andersen, M., Skinner, A. Williamson, A., Fernando, P. and Wright, D. (under review). 'Housing conditions are associated with recurrent gastrointestinal infection in urban Aboriginal children in NSW Australia: Cross-sectional findings from the Study of Environment on Aboriginal Resilience and Child Health (SEARCH).'

Signed

A handwritten signature in black ink, appearing to be 'Melanie Andersen', with a long horizontal stroke extending to the right.

Melanie Andersen

September 2017

5.3 *Study Four*: Housing conditions are associated with recurrent gastrointestinal infection in urban Aboriginal children in NSW Australia: a cross-sectional study.

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Study Four is under peer review by the *Australian and New Zealand Journal of Public Health*.

5.4 Author contributions

MA, AW, AS, DW and PF conceptualised the study. AW, DW and PF contributed to data collection. **MA**, AW and AS contributed to the statistical design of the study. AS conducted the data analyses. **MA**, AW, AS, DW and PF interpreted the findings. **MA** conducted the literature review and wrote the manuscript. AS drafted Appendix I. All authors critically revised, read and approved the final version of the manuscript.

5.5 Abstract

Objective: To examine the associations between housing and gastrointestinal infection in Aboriginal children in urban New South Wales.

Methods: 1398 Aboriginal children were recruited through four Aboriginal Community Controlled Health Services. Multilevel regression modelling of survey data estimated associations between housing conditions and recurrent gastrointestinal infection, adjusting for sociodemographic and health factors.

Results: 157 children (11%) had recurrent gastrointestinal infection ever and 37 (2.7%) required treatment for recurrent gastrointestinal infection in the past month. Children in homes with 3+ housing problems were 2.5 (95% CrI 1.10, 2.49) times as likely to have recurrent gastrointestinal infection ever and 6.8 (95% CrI 2.1, 30.2) times as likely to have received recent treatment for it (versus 0-2 problems). For every additional housing problem, the prevalence of recurrent gastrointestinal infection ever increased by a factor of 1.3 (95% CrI 1.1, 1.5) and the prevalence of receiving treatment for gastrointestinal infection in the past month increased by a factor of 1.6 (95% CrI 1.2, 2.5).

Conclusions: Housing problems were independently associated with recurrent gastrointestinal infection in a dose-dependent manner.

Implications for Public Health: The role of housing as a potential determinant of health in urban Aboriginal children merits further attention in research and policy settings.

5.6 Introduction

Gastrointestinal infection is a leading global cause of child mortality and a major public health issue in Australia (Chen, Ford et al., 2016, Hall and OzFoodNet Working Group, 2004). While episodes of gastrointestinal infection are usually mild and self-limiting in wealthy nations, some cases result in serious dehydration, hospitalisation and death (Moorin, Heyworth et al., 2010). Gastrointestinal infection can also affect child growth and development, school attendance and household productivity (Chen, Ford et al., 2016) and is associated with serious health sequelae including a range of cardiovascular, rheumatologic, gastrointestinal, neurological, skin and lung conditions (Burgner, Cooper et al., 2015, Moorin, Heyworth et al., 2010).

Gastrointestinal infection is the second most common cause of avoidable hospital admission for Aboriginal children in New South Wales (Falster, Banks et al., 2016). Aboriginal children are much more likely than their non-Aboriginal peers to be admitted to hospital with gastrointestinal infection (Carville, Lehmann et al., 2007, Falster, Banks et al., 2016, Moore, Manoharan et al., 2013) and, once there, to stay significantly longer and be readmitted for it more quickly (Carville, Lehmann et al., 2007, Moore, Manoharan et al., 2013). Australian studies indicate that children with recurrent gastroenteritis were more likely to also experience recurrent chest, skin and ear infections (Zubrick, Lawrence et al., 2004). Moreover, serious health sequelae are significantly more likely after recurrent gastrointestinal infection rather than a single episode and Aboriginal children are more likely to experience serious health sequelae after recurrent gastrointestinal infection than non-Aboriginal children (Burgner, Cooper et al., 2015, Moorin, Heyworth et al., 2010).

Housing is a well-recognised social determinant of health that is closely linked with social, economic and geographic factors (AIHW, 2014c, Baker, Lester et al., 2016, Baker and Howden-Chapman, 2012, NSW Department of Health, 2010). Poor housing environments can affect health, beyond other forms of deprivation, through myriad direct and indirect pathways (Baker, Lester et al., 2016, Dockery, 2013). The absence of functional facilities can impair engagement in healthy living practices, such as washing

people and clothes or the hygienic storage and preparation of food (Dockery, 2013, Torzillo, Pholeros et al., 2008). Crowding can affect health by increasing household stress, restricting access to facilities and through close contact transmission of infectious disease (Bailie, Stevens et al., 2010, Jacoby, Carville et al., 2011, Riva, Plusquellec et al., 2014). Multiple forms of housing disadvantage can also co-exist and have a cumulative, detrimental effect on health over time (Baker, Beer et al., 2017, Baker and Lester, 2016, Marsh, Gordon et al., 2000). Studies conducted outside of Australia have found significant associations between gastroenteritis and housing factors like crowding and the adequacy of housing facilities in non-indigenous populations (Baker, McDonald et al., 2013, Ferrer, Strina et al., 2008) and in several remote indigenous communities in Canada (Harper, Edge et al., 2015, Hayward, 2008, Pardhan-Ali, Wilson et al., 2013, Varughese, 2010). In Australia, significant associations have been identified between poor housing conditions and gastrointestinal infection for Aboriginal children living in remote communities (Bailie, Stevens et al., 2010, Harper, Edge et al., 2015) and in one Aboriginal child health cohort study with a relatively small proportion of urban children (Brandrup, 2013). The majority of Australian Aboriginal children live in urban areas (AIHW, 2014c) and while housing disadvantage is common for urban Aboriginal families (AIHW, 2014c, Baker, Lester et al., 2016, Biddle, 2012b, Dockery, 2013) little is known about possible links between housing conditions and gastrointestinal infection for urban Aboriginal children (Andersen, Williamson et al., 2016, Brandrup, 2013).

This study examines the relationship between housing conditions and carer report of recurrent gastrointestinal infection amongst children participating in phase one of the Study of Environment on Aboriginal Resilience and Child Health (SEARCH), the largest cohort study of urban Aboriginal child health in Australia to date.

5.7 Methods

SEARCH is a partnership between researchers, Aboriginal Community Controlled Health Services (ACCHS) in urban NSW, and the Aboriginal Health and Medical Research Council of NSW (The SEARCH Investigators, 2010). SEARCH aims to investigate the causes of health and illness in urban Aboriginal children attending participating ACCHS:

Mount Druitt (Aboriginal Medical Service Western Sydney); Campbelltown (Tharawal Aboriginal Corporation); Wagga Wagga (Riverina Medical and Dental Aboriginal Corporation), and Newcastle (Awabakal Ltd.) (The SEARCH Investigators, 2010). The study priorities were established in conjunction with participating Aboriginal community leaders (Andersen, Williamson et al., 2017b, The SEARCH Investigators, 2010) and two of the authors of this paper are Aboriginal.

Carers of eligible Aboriginal children were invited to participate in SEARCH by an Aboriginal research assistant when attending a participating ACCHSs. Carers were provided with a Participant Information Sheet and its contents were discussed.

Aboriginal children aged 0-17 years were eligible to participate if their parent or caregiver (hereafter carer) was aged 16 years or over and was willing to provide contact information for follow up interviews. No response rate data were kept. Survey data were collected between 2007-2011. Phase Two data collection is underway but is not reported in this study.

5.7.1 Ethics

The study was approved by the ethics committees of the Aboriginal Health and Medical Research Council of New South Wales (reference 586/06) and the University of Sydney (reference, 12-2003/9429). Written consent was provided by all participants.

5.7.2 Measures

SEARCH carers completed a survey about themselves covering a range of demographic, social, lifestyle and environmental factors, along with a comprehensive survey about their children's health and wellbeing (The SEARCH Investigators, 2010). In relation to gastrointestinal infection, recurrent infection was examined rather than acute episodes to capture chronic illness associated with higher risk of long-term sequelae (Burgner, Cooper et al., 2015, Moorin, Heyworth et al., 2010, Zubrick, Lawrence et al., 2004).

Carers were asked if their child had: a) 'ever had a recurring gastro infection' (yes/no) to measure lifetime prevalence and b) 'a recurring gastro infection treated in the past month' (yes/no) to measure recent occurrence. Evidence from Australia and overseas indicates that relatively few people seek healthcare for gastrointestinal illness; those

who do are more likely to have illness of greater severity and duration, thus the measure used is likely to capture relatively serious gastrointestinal infection (Hall and OzFoodNet Working Group, 2004, Harper, Edge et al., 2015).

Housing questions were drawn from established sources including the Western Australian Aboriginal Child Health Study, National Aboriginal and Torres Strait Islander Social Survey and Australian Housing Survey, or developed specifically for SEARCH in consultation with Aboriginal community leaders (Andersen, Williamson et al., 2017b). For a full description of the SEARCH housing variables, see Andersen et al. (2017b). The housing variables related to physical dwelling conditions and crowding were the focus of the current study. Physical dwelling problems were measured by carer's yes/no report of the presence of: major plumbing, electrical or structural problems, damp or mildew, vermin and if they are able to make their home warm enough in winter.

Crowding is a complex construct to quantify, particularly in cross-cultural contexts (AIHW, 2014c, Schluter, Carter et al., 2007); the measures we used included the number of people who normally sleep in the home (0-5/ 6 or more), the ratio of people per bedroom (0-2/ >2) (Brandrup, 2013, Canadian Mortgage and Housing Corporation, 1991) and carer's yes/no response to whether they 'felt too crowded where they lived' in the past 12 months. A tally of the total number of physical dwelling and crowding problem domains was created, with each home receiving a score of 0-8 'housing problems' (major plumbing problems; major structural problems; major electric problems; damp or mildew; vermin; unable to keep home warm in winter; felt crowded in past 12 months; and more than 2 people per bedroom). The housing problems variable was examined as a binary exposure (0-2 / 3 or more) and separately as a numeric score. The control variables used are detailed below.

5.7.3 Statistical methods

Multilevel log-binomial regression was used to estimate recurrent infection prevalence ratios for each housing exposure, adjusting for age, sex, recruiting ACCHS, family (modelled via a random effect), and a range of other socio-demographic and health

factors. Regression models were fitted for each exposure separately, first adjusting for age, sex, recruiting ACCHS and family, and then adjusting for all covariates. Additional covariates included in the fully-adjusted models for ever had recurrent gastrointestinal infection were household income, carer psychological distress (Kessler 10 score), prenatal maternal smoking, breastfeeding at 6 months (or current breastfeeding for children aged under 6 months), ever attended childcare or preschool, daily fruit and vegetable intake and current household smoking. For recurrent gastrointestinal infection treated in the past month, we restricted this set of additional covariates to income, breastfeeding at 6 months and childcare or preschool attendance, due to the small number of cases. These factors were chosen as previous analyses indicate they are strongly associated with gastroenteritis; very similar results were obtained using alternative sets of covariates, e.g., household income, carer psychological distress, fruit and vegetable consumption, and household smoking. Children were excluded from regression analyses where they had missing values for one or more explanatory variables. Multiple imputation analyses indicated that this approach to dealing with missing data does not affect our findings (see Appendices G-I).

All models were fitted using the MCMC procedure in SAS ver. 9.3 (SAS Institute, Cary, NC, USA), specifying diffuse normal priors for all regression coefficients, and a non-informative uniform prior for the standard deviation of the family-level errors. The regression models and analytical methods used are described in greater detail in Appendix G.

5.8 Results

Phase one survey data were available for 1467 children from 620 families, of which 1398 children from 602 families had non-missing data for recurrent gastrointestinal infection ever and 1367 children from 595 families had non-missing data for recurrent gastrointestinal infection treated in the past month. One hundred and fifty seven (11%) SEARCH children had ever had recurrent gastrointestinal infection and 37 (2.7%) had been treated for recurrent gastrointestinal infection in the past month (Table 5.1).

Table 5.1: Sociodemographic and health-related patterns of recurrent gastrointestinal infection among urban Aboriginal children in the SEARCH cohort

	Ever had a recurrent gastro. infection		Recurrent gastro. infection treated in the past month	
	Total ¹	% ever had (n)	Total ¹	% treated (n)
Total	1398	11.23 (157)	1367	2.71 (37)
Age at survey (years)				
Less than 1	69	7.25 (5)	68	4.41 (3)
1–4	515	16.50 (85)	501	4.39 (22)
5–11	629	8.59 (54)	616	1.62 (10)
12–17	185	7.03 (13)	182	1.10 (2)
Sex				
Female	672	8.63 (58)	663	1.51 (10)
Male	726	13.64 (99)	704	3.84 (27)
Household income per fortnight				
\$0–\$799	533	11.26 (60)	520	2.12 (11)
\$800–\$1999	570	12.11 (69)	561	3.74 (21)
\$2000 or more	119	8.40 (10)	118	4.24 (5)
Carer Kessler 10 score				
Less than 22	1015	11.03 (112)	990	2.63 (26)
22 or more	256	12.11 (31)	255	3.92 (10)
Prenatal maternal smoking				
No	628	12.58 (79)	617	3.40 (21)
Yes	706	10.20 (72)	688	1.89 (13)
Breastfed for 6 months or more				
No	918	11.55 (106)	898	2.45 (22)
Yes	300	11.00 (33)	291	2.41 (7)
Serves of vegetables per day				
0–1	192	9.38 (18)	186	1.61 (3)
2 or more	1169	11.72 (137)	1144	2.97 (34)
Serves of fruit per day				
0–1	127	10.24 (13)	126	3.97 (5)
2 or more	1226	11.50 (141)	1197	2.67 (32)
Ever attended childcare or preschool				
No	360	10.56 (38)	352	2.56 (9)
Yes	1014	11.64 (118)	991	2.72 (27)
Any household smoking				
No	685	10.95 (75)	673	3.27 (22)
Yes	548	10.58 (58)	537	2.61 (14)
Tenure type				
Mortgage or own	223	7.62 (17)	219	1.83 (4)
Renting	256	12.11 (31)	252	1.59 (4)
Social housing	837	11.95 (100)	819	3.54 (29)
Housing affordability problem				
No	863	10.31 (89)	849	2.24 (19)
Yes	444	13.51 (60)	431	4.18 (18)
Evicted in past 12 months				
No	1144	10.93 (125)	1120	2.86 (32)
Yes	174	14.94 (26)	170	2.94 (5)
Duration of residence in home				
Less than 12 months	292	13.70 (40)	286	2.45 (7)
12 months or more	1038	10.50 (109)	1018	2.95 (30)
Number of houses lived in				
0–3	928	10.88 (101)	907	2.65 (24)
4 or more	362	13.26 (48)	354	2.54 (9)

¹ Number of children with non-missing data on recurrent gastrointestinal infection. Numbers may not add up to total due to missing data.

5.8.1 Individual housing factors associated with recurrent gastrointestinal infection

In models adjusted for all sociodemographic and health factors, recurrent gastrointestinal infection ever was associated with major structural problems (aPR 2.4, 95%CrI 1.6, 3.9), major plumbing problems (aPR 2.0, 95%CrI 1.1, 3.5), damp or mildew (aPR 1.8, 95%CrI 1.1, 2.9) and carer report of feeling crowded (aPR 1.6, 95%CrI 1.0, 2.7) (Table 2). Having six or more people who normally slept in the home was associated with reduced likelihood of child recurrent gastrointestinal infection ever (aPR 0.6, 95%CrI 0.3, 1.0), compared to 0-5 people. Living in a home with major structural problems (aPR 3.7, 95%CrI 1.3, 13.3), vermin problems (aPR 5.1, 95% CrI 1.7, 23.8) or that could not be kept warm enough in winter (aPR 3.9, 95% CrI 1.1, 20.0) was associated with recurrent gastrointestinal infection treated in the past month (Table 5.2).

Table 5.2: Associations between recurrent gastrointestinal infection and housing problems (housing exposures examined separately)

Housing exposure	Ever had a recurrent gastrointestinal infection				Recurrent gastrointestinal infection treated in past month			
	Total ¹	% ever had (n)	PR † (95% int.) adjusted for age, sex, ACCHS	PR † (95% int.) adjusted for all covariates ²	Total ¹	% treated (n)	PR † (95% int.) adjusted for age, sex, ACCHS	PR † (95% int.) adjusted for all covariates ³
Major plumbing problems								
No	1114	10.50 (117)	1	1	1093	2.65 (29)	1	1
Yes	194	17.01 (33)	1.70 (1.09–2.65) *	1.95 (1.10–3.50) *	187	3.74 (7)	1.82 (0.61–4.72)	2.58 (0.69–11.59)
Major structural problems								
No	791	9.48 (75)	1	1	780	1.92 (15)	1	1
Yes	528	14.58 (77)	1.60 (1.11–2.26) *	2.42 (1.56–3.86) *	510	4.31 (22)	2.58 (1.26–5.76) *	3.72 (1.34–13.27) *
Major electrical problems								
No	1118	11.63 (130)	1	1	1095	2.92 (32)	1	1
Yes	177	10.17 (18)	1.00 (0.56–1.75)	1.67 (0.89–3.17)	175	2.86 (5)	1.40 (0.40–4.10)	2.29 (0.56–10.59)
Damp or mildew								
No	846	9.93 (84)	1	1	830	2.29 (19)	1	1
Yes	479	13.57 (65)	1.48 (1.02–2.17) *	1.82 (1.13–2.94) *	467	3.85 (18)	2.06 (0.97–4.79)	2.26 (0.79–7.31)
Vermin								
No	755	12.05 (91)	1	1	736	1.77 (13)	1	1
Yes	574	10.63 (61)	0.97 (0.68–1.41)	1.29 (0.80–2.08)	565	4.25 (24)	2.71(1.27–6.55) *	5.06 (1.68–23.76) *
Unable to keep home warm in winter								
No	1079	10.94 (118)	1	1	1054	2.28 (24)	1	1
Yes	235	12.77 (30)	1.19 (0.73–1.88)	1.73 (0.96–3.08)	232	5.17 (12)	2.36 (0.98–6.08)	3.88 (1.10–19.99) *
Number of usual residents								
0–5	805	13.54 (109)	1	1	784	3.19 (25)	1	1
6 or more	515	7.57 (39)	0.64 (0.42–0.97) *	0.56 (0.31–0.98) *	510	2.16 (11)	0.66 (0.27–1.46)	0.53 (0.11–1.85)
Felt crowded in past 12 months								
No	910	9.89 (90)	1	1	891	2.36 (21)	1	1
Yes	413	15.01 (62)	1.56 (1.07–2.28) *	1.63 (1.03–2.67) *	404	3.96 (16)	1.53 (0.67–3.40)	1.03 (0.28–3.12)
People per bedroom								
0–2	1144	10.75 (123)	1	1	1121	2.68 (30)	1	1
>2	175	13.71 (24)	1.65 (0.94–2.79)	1.27 (0.60–2.63)	172	3.49 (6)	1.32 (0.38–4.00)	0.93 (0.13–5.10)
Number of housing problems								
0–2	748	9.49 (71)	1	1	736	1.63 (12)	1	1
3 or more	423	14.18 (60)	1.64 (1.10–2.49) *	2.51 (1.57–4.21) *	416	5.29 (22)	3.61 (1.62–8.37) *	6.79 (2.11–30.17) *

¹ Number of children with non-missing data on recurrent gastrointestinal infection. Numbers may not add up to total due to missing data.

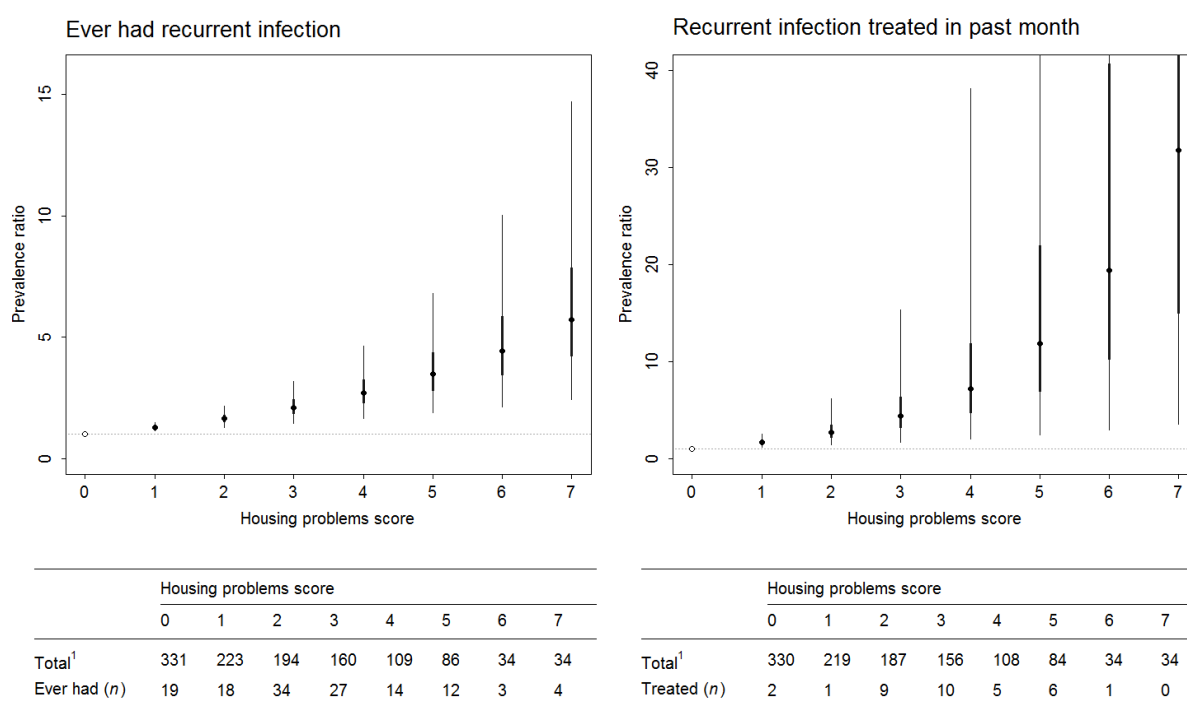
² Adjusted for age, sex, recruiting ACCHS, household income, carer Kessler 10 score, prenatal maternal smoking, breastfed for 6 months or more, serves of vegetables per day, serves of fruit per day, ever attended childcare or preschool, any household smoking. *95% Credible Interval excludes 1.

³ Adjusted for age, sex, recruiting ACCHS, household income, breastfed for 6 months or more, ever attended childcare or preschool. † Prevalence Ratio

5.8.2 Cumulative housing disrepair and trend analysis

Children in homes with three or more housing problems were more than twice as likely to have ever had recurrent gastrointestinal infection as those with 0-2 housing problems (aPR 2.5, 95%CrI 1.6, 4.2). They were also over six times as likely to have had treatment for recurrent gastrointestinal infection in the past month as those in homes with 0-2 problems (aPR 6.8, 95% CrI 2.1, 30.2). When analysed as a continuous variable, the number of housing problems was significantly associated with the prevalence of recurrent gastrointestinal infection ever and treated in the past month, after adjustment for demographic and child health factors (posterior probabilities of an increasing trend > 0.99) (Figure 5.1). For every additional housing problem, the prevalence of recurrent gastrointestinal infection ever increased by a factor of 1.3 (95% CrI 1.1, 1.5) and the prevalence of recurrent gastrointestinal infection treated in the past month increased by a factor of 1.6 (95% CrI 1.2, 2.5) (Figure 5.1).

Figure 5.1: Relationship between number of housing problems and recurrent gastrointestinal infection



¹ Number of children with non-missing data on recurrent gastrointestinal infections.

Figure 5.1 Relationship between the prevalence of recurrent gastrointestinal infection and the number of housing problems (the housing problems score, treated as a continuous predictor). Prevalence ratios were calculated using a problem score of 0 as the reference value (open circle), adjusting for age, sex, recruiting ACCHS, household income per fortnight, breastfed for 6 months or more, and ever attended childcare or preschool. Prevalence ratios for ever had a recurrent gastrointestinal infection were also adjusted for carer Kessler 10 score, serves of vegetables per day, serves of fruit per day, prenatal maternal smoking, and any household smoking. 95% credible intervals are indicated by thin error bars; the heavy error bars correspond to 50% credible intervals. Note different scales on the vertical axes.

5.9 Discussion

This is the first study to our knowledge to examine associations between housing and gastrointestinal infection in an exclusively urban cohort of Aboriginal children. Our results show that the more housing problems a child is exposed to, the greater their risk of recurrent gastrointestinal infection. These relationships existed over and above socioeconomic and other risk factors.

Recurrent gastrointestinal infection was reported for a relatively substantial proportion of children in this urban cohort, although differing case definitions and recruitment strategies between different studies make prevalence comparisons difficult (Hall and OzFoodNet Working Group, 2004). The only other study to our knowledge to have gathered data about the community prevalence of recurrent gastrointestinal infection was the Western Australian Aboriginal Child Health Survey, where 5.6% of children were reported by their carer to have recurrent gastrointestinal infection (Zubrick, Lawrence et al., 2004). The prevalence of housing problems reported by SEARCH carers was notably higher than those reported in studies of non-Aboriginal Australian households, as discussed elsewhere (ABS, 2015, Andersen, Williamson et al., 2017b).

Each of the specific housing problems significantly associated with recurrent gastrointestinal infection in this study have been previously associated with human health (Bonney, 2007). Factors such as vermin and major plumbing problems have relatively obvious plausible biological pathways to gastrointestinal infection (Torzillo, Pholeros et al., 2008). However, it is less intuitively clear how other problems like

mildew, temperature control or major structural problems may increase the risk of recurrent gastrointestinal infection. There is little existing evidence about these specific associations, although inadequate temperature control was associated with skin infection in remote communities (Bailie, Stevens et al., 2010). There is, however, evidence that homes with damp and mildew are more likely to be older, in poor condition and uninsulated; suggesting this may be a proxy for an old or poorly maintained home (Bonney, 2007).

The major finding of this study is the trend association between the *number* of housing problems and risk of recurrent gastrointestinal infection. It seems that housing conditions overall matter more than any one specific housing problem. Multiple housing problems may compound a child's risk of gastrointestinal infection in many ways; each additional problem may present an increased risk of pathogen exposure, impair residents' ability to perform healthy living practices, or be linked to other health and wellbeing issues which may then make a child more vulnerable to infectious disease. The challenges presented to residents attempting to perform their daily tasks in a crowded home are, for instance, potentially greatly exacerbated if the dwelling also has major problems with plumbing, electricity and vermin infestation. Cumulative housing disadvantage may be a particularly useful way to conceptualise and measure the severity and impact of poor housing on health and wellbeing (Baker and Lester, 2016, Marsh, Gordon et al., 2000). In remote communities, the overall score of housing dysfunction has been associated with respiratory infection, though not with gastroenteritis (Bailie, Stevens et al., 2010). Exposure to cumulative housing disadvantage in childhood has been shown elsewhere to relate to poor health outcomes in adulthood, irrespective of adult socioeconomic and housing conditions (Marsh, Gordon et al., 2000).

With regard to crowding, carer report of feeling crowded was significantly associated with ever having recurrent gastrointestinal infection, whereas the objective crowding measure (> 2 persons per bedroom) was not. This may indicate that the subjective crowding question captures issues relevant to health not measured in customary

person per bedroom ratios, such as dwelling size, design, bathroom facilities, family composition and cultural factors (Memmott, Birdsall-Jones et al., 2012, Schluter, Carter et al., 2007). In existing Aboriginal child health studies in remote and mixed settings, objective measures of crowding were likewise not significantly associated with gastroenteritis (Bailie, Stevens et al., 2010, Brandrup, 2013). That having six or more usual residents was protective against having ever had recurrent gastrointestinal infection (though not in the past month) is a somewhat unexpected finding, as exposure to more household members has been associated with increased risk of exposure to infectious disease pathogens, although evidence exists that this risk is moderated by dwelling size (Jacoby, Carville et al., 2011). This finding may be due to chance association or it may reflect existing suggestions that large households are not inherently problematic for health, provided housing facilities afford adequate space and amenity to meet the needs of the people in the home (Biddle, 2011b). Some research suggests larger households may be beneficial for Aboriginal people (Zubrick, Lawrence et al., 2004) for instance by enabling resources and the care of children to be shared (Biddle, 2011b). It is also possible that large households must develop functional routines in order to keep the household healthy.

Given that most Aboriginal people live in urban areas (AIHW, 2014c), that housing disadvantage is common amongst urban Aboriginal people (Baker, Lester et al., 2016, Dockery, 2013), and that the majority of the health gap is attributable to Aboriginal people living in non-remote areas (Vos, Barker et al., 2009), more information is urgently needed about what works to improve the housing situations of urban Aboriginal communities and whether improved housing conditions result in better health outcomes. While no housing intervention studies have been conducted in urban Aboriginal communities, some have been conducted with Aboriginal people in rural and remote areas. A prospective study of 418 children from 10 remote Aboriginal communities in the Northern Territory which received government housing improvement programs did not find that improved housing conditions alone resulted in significant improvement in carer-reported child health outcomes, including gastroenteritis (Bailie, Stevens et al., 2012). Study authors suggested that housing

interventions in remote communities must also do more to address crowding and encompass a broader ecological approach, incorporating hygiene promotion programs and addressing broader community-level environmental health factors in order to maximise improvements to health (Bailie, McDonald et al., 2011, Bailie, Stevens et al., 2012). However, an evaluation of a targeted, health and safety focussed housing repair and maintenance program provided to 9528 people from 71 rural and remote Aboriginal communities across NSW found significant reductions in hospital separations for infectious disease in the intervention group compared to matched communities who did not receive the program (NSW Department of Health, 2010). The largest health improvements, measured using geo-coded hospital separations data, were observed for intestinal infection, which dropped by 43% in the intervention group and increased by 3% in the control group (NSW Department of Health, 2010). The differences in study findings may suggest that geographic factors or the type of housing improvements conducted influence the effectiveness of housing intervention programs. Regardless, findings from these studies are unlikely to be directly applicable to Aboriginal people living in urban communities given the considerable differences in social and environmental circumstances between these settings and specific studies in urban areas are required.

The following caveats should be noted in regard to this study. Associations between housing and gastrointestinal infection are complex and closely linked to a range of other social, environmental and other mediating factors. While this study has used modelling techniques to control for confounding by variables available in the SEARCH survey, many other factors not measured in this study may also be associated with gastrointestinal infection, including but not limited to vaccination against rotavirus, the presence of younger siblings, household hygiene practices and other health behaviours (Bailie, McDonald et al., 2011, Bailie, Stevens et al., 2012, Bailie, Stevens et al., 2010, McDonald, Bailie et al., 2010). As with all studies examining multiple variables, chance associations may occur. Also, causal inference cannot be asserted from cross sectional studies. Once longitudinal SEARCH data become available, examination of the direction of influence between housing and health over time will be possible. SEARCH is not a

representative sample and our results may not be generalisable to other populations. Recruitment through ACCHSs may increase the likelihood of recruiting participants with recent health problems. That said, participants attending ACCHSs are not necessarily unwell, as ACCHSs provide a broad range of preventative health and wellbeing programs and a range of other community services (Panaretto, Wenitong et al., 2014). Participants in SEARCH are a relatively disadvantaged urban Aboriginal sample in terms of socioeconomic status, with lower average household incomes and lower rates of home ownership than the broader Aboriginal population of NSW (ABS, 2017c). This limits the generalisability of findings about the prevalence of housing problems, but does not affect the validity of the internal associations noted between housing problems and gastrointestinal illness, as the models used controlled for socioeconomic status.

Carer self-report data may not be as accurate as objectively measured data. However, as carers completed questions about a wide range of environmental, cultural and behavioural exposures and many child health outcomes, they were not conscious of the particular relationship being examined in the current study at the time of completion; hence, it is unlikely that any inaccuracies were differential with regard to associations between housing and gastrointestinal infection. The data available relate to current housing conditions, not a full history of all homes lived in, a common difficulty in housing research (Marsh, Gordon et al., 2000). There are obvious temporal issues with studying the health effects of housing exposures, including time lag effects as both current and previous housing exposures may be associated with ill health (Dockery, 2013, Marsh, Gordon et al., 2000). Given that clear associations were observed between recurrent gastrointestinal infection ever and current housing conditions, even after controlling for socioeconomic status, we hypothesise that for those who have moved, current housing conditions may be indicative of previous housing conditions.

These caveats notwithstanding, SEARCH is the largest urban Aboriginal child health cohort in Australia to date and this study contributes new information about the links between housing and gastrointestinal infection for urban Aboriginal children, an under-

researched field. The associations found are biologically plausible, substantial, significant and largely consistent with existing knowledge (Andersen, Williamson et al., 2016, Brandrup, 2013, NSW Department of Health, 2010). The findings also support recent qualitative research conducted with Aboriginal people in Western Sydney, who asserted that poor housing conditions were negatively affecting the health of urban Aboriginal children, including through gastrointestinal infection (Andersen, Williamson et al., 2016). Research examining associations between housing and other health outcomes for urban Aboriginal children and adults is indicated, along with high quality housing intervention studies to examine whether improved housing conditions result in improved health outcomes for urban Aboriginal people.

5.10 Conclusion and implications

While most Australians enjoy high quality housing, a sizeable portion of urban Aboriginal people do not (AIHW, 2014c, Baker, Lester et al., 2016) and this study suggests that housing problems may be contributing to the health gap experienced by urban Aboriginal children. Treatment for most infectious disease is readily available in Australian cities (NSW Department of Health, 2010), but infectious disease disparity for Aboriginal people remains (Falster, Banks et al., 2016, Vos, Barker et al., 2009). Unless the underlying drivers of infection are addressed, children who receive treatment simply return to the same conditions that contributed to their illness (Baker and Howden-Chapman, 2012, NSW Department of Health, 2010). Along with social justice arguments, economic arguments can be made for more action to improve the availability of affordable, decent quality housing as a preventative health measure (Baker and Howden-Chapman, 2012, NSW Department of Health, 2010, Parsell, Petersen et al., 2016). This is not to suggest that improved housing is enough in itself to close the urban Aboriginal health gap (Andersen, Williamson et al., 2017a). Rather, housing should be a key part of a broader suite of multi-faceted initiatives that involve governments working with Aboriginal organisations and communities to address underlying social, economic and environmental determinants of health (Andersen,

Williamson et al., 2017a). Importantly, housing needs to be on the agenda as a potential health issue for Aboriginal people in all parts of Australia.

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CHAPTER 6: DISCUSSION

6.1 Summary of key findings and contributions

This thesis is the first body of work to focus on urban Aboriginal housing as it relates to health and wellbeing in Australia. It provides a systematic examination of urban Aboriginal people's beliefs about their housing and a granular description of the housing conditions of a significant sample of urban Aboriginal people in identified communities. It also offers some initial evidence of an association between exposure to housing problems and gastrointestinal infection in urban Aboriginal children. It provides a platform to better understand housing and health in these communities and to design, develop and test housing interventions.

This work has established that housing is an issue of critical concern for many Aboriginal people in urban NSW. The housing disparity between Aboriginal and non-Aboriginal people is complex, but participants in the focus group interviews reported in **Chapters 2 and 3** believed that it was fundamentally underpinned by unequal race relations in Australia. While existing qualitative research has highlighted the difficulties experienced by Aboriginal people in urban parts of Western Australia and South Australia in regard to housing access, affordability and stability (Birdsall-Jones and Corunna, 2008, Gallaher, Ziersch et al., 2009), this thesis confirms that Aboriginal people in Sydney, Australia's most populous and affluent city, are experiencing similar problems. Importantly, this thesis also extends this work thematically to illustrate the perceived central importance of housing for urban Aboriginal people as a determinant of health. Study participants were worried about the quality of their housing and the effect they believed poor housing conditions had on their health, *'It's affected our health, and it's gonna affect our kids' health'*. But in prosperous cities and towns with increasingly unaffordable and competitive housing markets and a contracting social housing sector, many Aboriginal people are falling through the net. Given the reported difficulties accessing good quality housing through the private market, study participants reported having little choice or ability to change their housing situations, despite their concern about adverse health effects, so *'they put up with sub-standard housing... because they've got nowhere else to go'*.

The concerns expressed by focus group participants were validated by the quantitative findings in this thesis, which demonstrate that housing problems were common for SEARCH families and that the more housing problems children were exposed to, the higher their likelihood of having recurrent gastrointestinal infection. The close congruence between the qualitative and quantitative findings – which used different kinds of data, were collected from different study participants and were analysed using different methods – constitute a form of triangulation, which increases the credibility of the findings as a whole (Creswell and Plano Clark, 2003). Considering the qualitative and quantitative findings of this thesis together, viewed in the context of what is known more broadly about the links between housing and health elsewhere, a strong argument can be made for the urgent need for researchers and policy makers to pay closer attention to urban Aboriginal people's housing conditions.

The differences observed in exposure to housing problems by tenure type, independent of sociodemographic factors, support existing evidence that social housing provides an important public good by way of offering affordable and relatively stable housing, both of which are known to improve child health and development outcomes (Dockery, 2013, Phibbs and Young, 2005, Stone and Reynolds, 2016a, Williamson, D'Este et al., 2016). However, the findings in this thesis also suggest the need to improve dwelling conditions for Aboriginal people renting homes in urban areas, particularly from a social housing provider, where the number of dwelling problems were significantly higher than those found in both privately rented and owned homes. The finding of an association between housing problems and recurrent gastrointestinal infection is in keeping with studies of housing and gastrointestinal illness in other populations and locations (Bailie, Stevens et al., 2010, NSW Department of Health, 2010, Thomson, Thomas et al., 2013), but this thesis is the first time this relationship has been examined specifically with urban Aboriginal Australians.

The findings in **Chapters 4** and **5** are subject to the normal limitations inherent in cross-sectional analyses of self-report data noted in **Chapters 1, 4** and **5**. As outlined in **Chapter 5**, while every attempt has been made to control for potential confounders in the analyses conducted, confounding may remain nonetheless. Significant effort was

invested in trying to establish a small housing intervention study, which would have contributed objective housing data for a subsample of SEARCH households to validate the self-reported SEARCH housing data, but unfortunately this proved not to be feasible as part of this thesis.

SEARCH families are not a representative sample of urban Aboriginal households in NSW (AIHW, 2014c). Because recruitment was conducted through Aboriginal Community-Controlled Health Services, it is possible that SEARCH participants may have higher rates of recent illness than the general urban Aboriginal population, or that they may differ systematically from the urban Aboriginal population in other ways. Given that a much higher proportion of SEARCH households live in social housing than do other urban Aboriginal households in NSW, and that dwelling problems were reported at levels comparable with remote communities (AIHW, 2014c, 2017), SEARCH is likely to be a relatively disadvantaged urban Aboriginal cohort. Thus, this thesis provides insights into the housing needs of a high-risk group of urban Aboriginal families. This limits the generalisability of findings about the prevalence of housing problems to the broader urban Aboriginal population but does not affect the validity of the internal associations examined in **Chapters 4 and 5** (Thurber, Banks et al., 2015).

As the first focused study of housing and health in a large sample of urban Aboriginal people, this thesis provides the best available information to date about housing as it relates to health in this hard-to-reach population. Thus this work constitutes an advance, albeit imperfect, to current knowledge in this under-researched space.

6.2 Suggestions for future research

6.2.1 Further descriptive studies

This thesis has built a strong platform to make optimal future use of the SEARCH data. Plans are underway to examine the associations between housing and several other health issues in SEARCH participants, including other kinds of infectious disease (otitis media, chest and skin infection), injury, asthma, social and emotional wellbeing and developmental outcomes. Other housing 'exposures' will also be examined in closer detail, including housing instability and affordability problems. Broader

conceptualisations of cumulative housing disadvantage or 'housing insults' - similar to those proposed by Baker and Bentley, which include dwelling conditions, tenure stability, affordability and a range of other factors - may also be useful (Baker, Beer et al., 2017).

A paper examining the agreement between subjective crowding and commonly used objective crowding definitions, along with an examination of different crowding thresholds and in relation to health outcomes, is currently underway in response to the differences observed in the prevalence and health associations between different crowding measures, but this work will not be included in this thesis. Phase 2 of SEARCH will also include data about experiences of homelessness given its emergence as a key finding in **Chapter 2**. As subsequent waves of SEARCH data become available, longitudinal research will enable an examination of the direction of associations between housing factors and health over time, overcoming some of the limitations of cross-sectional study design.

LSIC is another valuable, longitudinal data source which is currently conducting its tenth annual survey. Recent LSIC surveys have included detailed questions about housing conditions which, to the best of our knowledge, are yet to be analysed in relation to health and wellbeing, aside from the studies previously described that used the high-level housing measures gathered in waves 1-2 and 1-4 (Brandrup, 2013, Dockery, 2013). LSIC has enough participants from urban areas to enable a specific study of urban Aboriginal housing and health to be conducted. The data are accessible to researchers at minimal cost and represents an opportunity to conduct longitudinal research with relative expediency.

6.2.2 The need for intervention research

Some may argue that before intervention studies are conducted, more knowledge is needed about which housing problems are most prevalent and strongly associated with other aspects of health and wellbeing in a representative sample of urban Aboriginal people, or in a study with more robust design. However, given the level of housing problems observed in SEARCH participants, the potential impact it may be having on

child health and the benefits observed from housing improvement programs elsewhere (Howden-Chapman, Crane et al., 2011, NSW Department of Health, 2010), the research most urgently needed is well-designed intervention research to learn what may work best to improve the situation.

'While descriptive research provides valuable information on health patterns and determinants, it does not provide direct evidence on how to create change, and does not produce change as it occurs. Increased focus on intervention research may provide more direct assistance in both understanding how to produce change and in improving Indigenous health outcomes.' (Sanson-Fisher, Campbell et al., 2006, p. 505)

Housing intervention studies can be costly and pragmatically difficult, but they can also provide high level evidence about health determinants and are required to evaluate whether housing improvement programs will work to improve housing, health and other outcomes in this population (Paul, Sanson-Fisher et al., 2010).

Research conducted in partnership with government to evaluate the implementation and outcomes of new policies and programs offer the greatest scope for testing real-world interventions and generating policy-relevant findings. Economic evaluations of housing intervention programs for urban Aboriginal people may prove particularly useful for informing policy and program decisions, particularly given the dominance of neoliberal discourse about government spending on social and affordable housing (Jacobs K, Atkinson R et al., 2010, NSW Audit Office, 2012). A housing intervention study similar to that which evaluated the health impact of the 'Housing for Health' program in rural and remote Aboriginal households, but in urban NSW, may be a valuable, feasible and relatively low-cost option (NSW Department of Health, 2010).

6.2.3 Studies of racial discrimination

The finding in **Chapters 2** and **3** that Aboriginal people in Western Sydney often experience racial discrimination, particularly in the private rental market, highlights the importance of addressing racial discrimination, including through the means outlined in **Chapter 3**. Further examination of racial discrimination, including gathering higher-level evidence, may be required to inform such efforts. Evidence about the scale and

nature of the discrimination being faced by Aboriginal people seeking private rental accommodation may be useful in advocating for and designing policies and programs that aim to actively challenge racial discrimination (Berman and Paradies, 2008). A particularly effective means of quantifying racial discrimination could be through the replication of a novel, 'mystery shopper' study that recently found statistically significant, differential treatment of Anglo-Saxon, Indian and Muslim Middle Eastern renters in Sydney's private housing market (Macdonald, Nelson et al., 2016), this time including Aboriginal 'tenants'.

6.3 Policy implications

'In an environment where 'evidence-based policy' is almost a mantra, the evidence available to support the design of Indigenous policy in Australia is noticeably weak.'

(Biddle, 2012c, p. 153)

Substantial health disparities exist between urban Aboriginal people and their non-Aboriginal neighbours and understanding the factors that underpin this gap is vital for informing policies and programs that aim to close them. Some clear policy implications have emerged from this thesis that have already been tabled with the NSW government. Governments can affect housing quality, affordability and availability through many different mechanisms. The potential for government policy to affect the housing situations of Aboriginal people is particularly great due to their overrepresentation as low-income renters in receipt of housing support, including social housing and housing assistance payments (AIHW, 2014b, Biddle, 2012b). While the importance of research evidence for informing policy is widely accepted, policy-makers must contend with many other complex and competing influences, including limited resources, the legacy of past policies and existing infrastructure, political ideology and priorities, public opinion, the media, stakeholder interests and the economic climate (Redman, Turner et al., 2015).

In recent years, housing has become an extremely topical issue in Australia and beyond. There is now a great deal of media, public and political interest in the dwindling availability of affordable housing and in issues such as tenancy rights for the increasing proportion of long-term renters (Hulse, Burke et al., 2012, Stone and Reynolds, 2016b, Stone, Sharam et al., 2015). There is also growing concern over dwelling conditions in rental accommodation, social housing and about construction standards more broadly, particularly in the wake of the Grenfell tower fire in London and the Lacrosse building fire in Melbourne (Dziedzic, 2017, McKinnon, 2017, National Shelter, CHOICE et al., 2017).

When presented with the option of unstable, unaffordable housing in the private sector and social housing of poor quality, participants in **Chapters 2** and **3** expressed a preference for social housing. However, long waiting lists meant that social housing was not accessible for many people, the result being unaffordable rent, instability, crowding and homelessness. This begs the question of who is responsible for the substantial and growing shortfall in social and affordable housing. In Australia, state governments are responsible for the provision of social housing and homelessness services, along with various community organisations (Milligan, Phillips et al., 2011a). The federal government provides a substantial amount of funding to the states for the provision of these services and spends a considerable amount on rent assistance; unlike in other countries, local governments largely do not have responsibilities for the provision of social housing (National Commission of Audit Website). While state and federal government housing responsibilities, services and programs exist, the insufficient resources being invested in these services within a general climate of economic austerity are resulting in considerable unmet housing need for Australia's most vulnerable residents.

As mentioned in **Chapter 1**, in 2016 the NSW government released a new ten year social and affordable housing strategy named 'Future Directions' (NSW Government, 2016). Several significant changes to the social housing system are planned. While these plans include the delivery of 'up to 23,000 new and replacement social housing dwellings' and improved service experiences for tenants, they also involve targets to

transition some social housing tenants out of social housing and into 'independence' in the private market. Other aspects of the plan include the widespread transfer of social housing stock to Community Housing Providers (CHPs) and increased involvement of the private and non-government sector in the ownership and management of social and affordable housing assets (NSW Government, 2016, Shaw, 2017). These plans, along with similar moves in other Australian states, have been met with reservation by housing academics and tenant and other interest groups (Pawson, 2016a, Phibbs, 2016, Shaw, 2017, Tenants' Union of NSW, 2016). Alongside these proposed changes, there has also been a recent shift away from housing service provision by Indigenous Community Housing Organisations (ICHOs) towards mainstream social housing and non-government Community Housing Providers as discussed in **Chapter 3** (Milligan, Phillips et al., 2011b). The findings of this thesis will be discussed with regard to their potential implications for these strategies and other policy areas.

The results of **Chapters 4 and 5** indicate that improved dwelling conditions for urban Aboriginal people are required, particularly in social housing accommodation. The range of housing problems associated with recurrent gastrointestinal infection in **Chapter 5** and the trend association observed with cumulatively poorer conditions suggests that improvements might best address dwelling conditions overall rather than to target any particular dwelling problem. The Housing for Health Program currently provided through NSW Health may be a good model if it can be adapted for application in state-owned and managed social housing, the main providers of social housing for urban Aboriginal people. This could well be a cost-effective preventative health strategy (Howden-Chapman, 2012, Keall, Pierse et al., 2017, NSW Department of Health, 2010)

The findings in **Chapters 2 and 3** also highlight the key role social housing plays in stability and affordability for urban Aboriginal people, which we know from other research are important for child wellbeing and educational outcomes (Dockery, 2013, Phibbs and Young, 2005, Williamson, D'Este et al., 2016). Australian childhood residential mobility is high by international standards (Bell and Hugo, 2000) and is higher for Aboriginal than non-Aboriginal children (Dockery, 2013). Households with

children in receipt of Commonwealth Rent Assistance in private rental have higher housing affordability stress and less housing stability than those in social housing (Taylor and Edwards, 2012). The shortfall of social housing and the stated aim of Future Directions to transition 'opportunity group' social housing tenants out of social housing and into the private rental system thus pose a potential concern for the wellbeing of children from low income families (Pawson, 2016a, Phibbs, 2016).

A policy response that could improve the dwelling conditions of tenants renting from both private landlords and social housing providers is the introduction of minimum housing standards for rental properties, similar to New Zealand's 'Warrant of Fitness' (Bennett, Howden-Chapman et al., 2016) as discussed in **Chapter 4**. As it stands in Australia, considerable public funds are paid in Commonwealth Rent Assistance, much of which increases profits for private land lords through higher market rents, with little assurance of dwelling quality for tenants in return (Productivity Commission, 2016).

The findings in this thesis also support the need for other improved protections and support for renters in the private system, particularly in light of the goal of Future Directions to shift tenants into the private market. These may include removal of 'without grounds' termination (Martin, 2017, Pawson, 2016a), improvements to Commonwealth Rent Assistance (Hulse, Burke et al., 2012) and policies to prevent racial discrimination in the private rental market, which affects the ability of many Aboriginal people to secure rental accommodation, as discussed in **Chapter 4** (Equal Opportunity Commission, 2011, Macdonald, Nelson et al., 2016).

While general strategies to improve access to social and affordable housing are likely to also benefit Aboriginal households, specific, culturally appropriate programs tailored to the needs of urban Aboriginal people remain vitally important. Mainstream housing policies are not always designed with the needs of urban Aboriginal households in mind; it is important that services are acceptable to and used by all who need them (Milligan, Phillips et al., 2011b, Ware, 2013b). Participants in the studies in **Chapters 2** and **3** highlighted a need to provide some Aboriginal people with better support to navigate the social housing system and to improve the cultural competence of social

housing services beyond efforts currently made in this regard. New approaches suggested by participants included the employment of Aboriginal housing liaison positions within urban ACCHSs. More broadly, participants in these studies believed that both governments and Aboriginal organisations had a valuable role to play in improving housing situations for Aboriginal people in urban areas.

There is some evidence that dwelling conditions in community housing provided by NGOs are better than those in state owned social housing (AIHW, 2013b). But participants in Studies One and Two expressed many reservations about the planned transfers of social housing services to NGOs. These included concerns that the social housing system may become more complex, opaque and difficult to navigate, concerns about the cultural competence of some NGOs, and concerns about the potential for service gaps to emerge if the priorities of individual charities do not match the Aboriginal community's needs. There were also concerns expressed about accountability and how tenant interests may fare under competitive, cost-driven tendering models under Future Directions plans for 'more competition and diversity in the provision of tenancy management services'. The central importance of strong accountability frameworks to be established and enforced have likewise been highlighted by academic commentators and in the Productivity Commission's recent preliminary report into introducing competition into human services (Pawson, 2016b, Productivity Commission, 2016).

The better dwelling conditions and housing stability observed for home owners in **Chapter 4** support the existing notion that home ownership is associated with multiple advantages and thus that programs that support Aboriginal people into home ownership are likely to be beneficial for those who are able to take them up. However, it must be acknowledged that this option is increasingly unattainable for all low to middle income households in Australia, particularly in Sydney, and that home ownership is not always considered desirable by Aboriginal people (Crawford and Biddle, 2016, Sanders, 2008). That 40% of SEARCH households in their own homes reported problems with housing affordability suggests that new solutions may be required to support some households in this situation (Stone, Parkinson et al., 2016).

Existing Aboriginal home ownership schemes appear to be achieving some success given that home ownership rates are slowly rising for Aboriginal households even while they fall in the general Australian population (Biddle and Markham, 2017). This is in contrast to home ownership rates for Maori people in New Zealand, for instance, which have fallen notably in recent decades (Statistics New Zealand, 2016).

Ultimately though, more social and affordable housing is required to address the needs of low and middle income households to prevent homelessness, overcrowding and substandard conditions for urban Aboriginal families, and the broader population (Beer, Baker et al., 2011, Hulse, Burke et al., 2012, Stone and Reynolds, 2016a, b). A 2009 estimation of the number of additional social housing dwellings required to address unmet Aboriginal housing need in Australia found that 10,550 additional dwellings were required in non-remote areas, compared to 4752 required in remote/very remote areas (AIHW, 2009). Biddle further highlights that as urban Aboriginal population growth far outstrips that of non-Aboriginal Australians and that of Aboriginal Australians in remote areas, a large number of additional affordable homes will be required 'just to maintain the unacceptable status quo' (Biddle, 2009b). This is unlikely to be achieved without substantial housing policy change, given that Australia's social housing sector is 'grossly underfunded' (NSW Audit Office, 2012, Pawson, 2016b), that social housing is often depicted as 'a failed policy that reinforces welfare dependency' (Jacobs, 2016) and that housing affordability in Australia is showing little sign of improvement (Demographia, 2017, Kemp, Paleologos et al., 2014).

In 2016, the NSW government announced a new Social and Affordable Housing Fund consisting of a \$1.1 billion investment fund to provide an income stream to deliver new social and affordable housing. This fund aims to enable 3,000 new social and affordable homes to be built over the next few years (Nicholls, 2016, Pawson and Milligan, 2015). However, there are over 60,000 applicants on social housing waitlists in NSW and many more households than this are living in rental affordability stress in NSW (Pawson and Milligan, 2015). Prohibitive cost is often identified as a key barrier to alleviating unmet housing need. While the interest to be earned from the SAHF \$1.1bn seed fund is not insubstantial, it should be viewed in the context of the much larger amounts of money

that Australia currently devotes each year to subsidised home ownership for the wealthy through tax concessions. As stated in a recent report by the Grattan Institute,

'A substantial change to Australia's tax arrangements is long overdue. The interaction of a fifty per cent capital gains tax discount with negative gearing distorts investment decisions, makes housing markets more volatile and reduces home ownership. Like most tax concessions, these tax breaks largely benefit the wealthy. These two measures in combination allow investors to reduce and defer personal income tax, at an annual cost of \$11 billion to the public purse.' (Daley, Wood et al., 2016)

The total amount of revenue forgone annually in Australia for all housing schemes and tax incentives that benefit property owners is estimated at over \$50 billion per year (Jacobs, 2016). By way of comparison, in 2013 just under \$4 billion was spent supporting low income earners through Commonwealth Rent Assistance and a total of \$4.2 billion was spent by governments on social housing.

Governments face a difficult political balancing act in their attempts to address the housing affordability crisis (Gurran and Phibbs, 2015).

'To see Australia's shortage of affordable housing as a failure of government is to misunderstand the politics that underpin housing. The vast proportion of government money spent on housing directly benefits the well-off at the expense of private renters and public housing tenants. Government policy has not, on the whole, failed. It has been a huge success insofar as protecting the opportunities for speculative investment and profit for homeowners and private landlords. If the government was serious in wanting to end the housing crisis it would need to invest in new social housing and pursue measures that choke off, via tax reform, the opportunities for profiteering currently enjoyed by landlords and homeowners. The pursuit of these options would be bitterly opposed – not least by many homeowners and property investors, as it would lead to a fall in house prices.'

(Jacobs, 2016)

These areas of public policy are complex; but fundamentally, inequality and unmet housing need are rising in Australia and these concerns affect some groups, including Aboriginal Australians, more profoundly than others (Stone and Reynolds, 2016a). The extent to which Australians consider housing inequality as inequitable - inequality that is 'unfair, unjust, systematic, avoidable and unnecessary' (Woolfenden, Goldfeld et al., 2013, p. 365) - may, in part, determine the extent to which it is curbed. The participants in **Chapters 2** and **3** of this thesis considered Aboriginal housing disadvantage to be inherently unfair and unjust, a by-product of unequal race relations in Australia.

Given what is known about the social gradient in health, public health professionals have a clear role to play in arguing for social policies that promote the equitable distribution of resources (Shaw, 2004, Wilkinson and Marmot, 2003). This includes advocating for investment in social and affordable housing as essential public health infrastructure (Baker and Howden-Chapman, 2012, Cutts, Meyers et al., 2011, Howden-Chapman, 2012, Krieger and Higgins, 2002). Australia's annual expenditure on health exceeded \$161 billion in 2014-15, of which government spending constituted over \$108 billion (AIHW, 2016). Economic evaluations of various housing improvement programs provide compelling evidence that helping people to access adequate housing can not only alleviate suffering, it is often a cost-effective endeavour (Grimes, Denne et al., 2012, Howden-Chapman, 2012, Keall, Pierse et al., 2017, Parsell, Petersen et al., 2016, Telfar-Barnard, Preval et al., 2011).

6.4 Concluding remarks

This thesis provides a detailed source of information about urban Aboriginal housing in relation to health. The findings suggest the need for further research and policy attention to be directed towards urban Aboriginal housing as a potential determinant of health and offer a platform on which future work may stand. It is hoped that these findings will help inform programs, policies and future evaluation research and ultimately prompt action to improve the housing situations of the many urban Aboriginal Australians who are struggling to secure suitable housing in Australia's increasingly unsympathetic housing markets.

CHAPTER 7: REFERENCES

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CHAPTER 8: APPENDICES

Appendix A – Participant Information Form, Chapters 1 and 2

PARTICIPANT INFORMATION SHEET

Study of Environment, Aboriginal Resilience and Child Health (SEARCH) – Housing Study Focus Groups

What is the housing component of the Study of Environment, Aboriginal Resilience and Child Health (SEARCH)?

SEARCH is a NSW based study that looks at what causes health and illness in Aboriginal children living in urban communities. The part of the study you are currently being invited to participate in is focussed on housing and, in particular, learning more about the housing issues for Aboriginal people in your local community and your ideas about housing in relation to health.

Some general things you might want to know about this research.

You are being asked to take part in a focus group about housing. Participating in this study is voluntary. You may decline to participate, or you may withdraw your consent to be in the study, for any reason, at any time.

It is important that you understand the information on this sheet so that you can make an informed choice about participating in the housing focus groups component of SEARCH. This information sheet is for you to keep and you will also be given a copy of your consent form. If you have any questions about this study at any time, please contact the researchers listed at the end of this form, or speak to your interviewer.

Who is carrying out the study?

SEARCH is led by the Aboriginal Health and Medical Research Council (AHMRC), Aboriginal Medical Services, the Sax Institute, NSW Health, and leading health researchers in NSW. The study is being conducted through four participating Aboriginal Medical Services in NSW. The research team is being led by Associate Professor Jonathon Craig from the University of Sydney and Professor Sandra Eades from the Sax Institute.

What will happen if I take part in a focus group?

There will be at least 4 focus groups held. Each group will be asked some questions to learn more about participants' opinions about a range of issues related to housing. No questions will be directed to you individually, but instead will be posed to the group as a whole. You may choose to respond, or not respond, at any point during the discussion. Some of the issues that may be discussed during the session include:

- Housing issues for Aboriginal people in your community
- If you think housing affects health
- How significant an issue housing is for you and your community

Each focus group will be facilitated by Aboriginal researchers with experience in qualitative research, and have between 6 and 12 participants. The focus group discussion will be tape recorded so we can capture comments in a transcript for analysis.

*SEARCH Housing – Participant Information Sheet
This information sheet is for you to keep*

1 of 2

How much time will the study take?

Your participation in this focus group will last approximately one hour and will take place at your local Aboriginal Medical Service.

Can I withdraw from the study?

Participation in this study is completely voluntary - you do not have to participate. In addition, you are free to withdraw your consent and stop being involved in the study at any time. You do not need to explain why you no longer wish to participate and this will not influence in any way the quality of health care you will receive from the AMS in the future.

Will anyone else know the results?

All aspects of the study, including results, will be strictly confidential and only the researchers will have access to information on participants. No information will be released in a way that would allow an individual to be identified, except as is required by law. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Are there any risks involved?

You will be asked to discuss issues related to housing. You may find thinking about these issues upsetting. Before deciding to take part in the housing focus groups this risk will be fully explained to you, and you will receive information about services available within your AMS to provide assistance, counselling and support should you require it.

Will the study benefit me?

Information given during the focus groups will be used to inform a study being designed to improve the housing situation of Aboriginal people in your community. You may benefit directly by being involved in this housing improvement study, or indirectly by helping to create information on the housing needs of Aboriginal people which may lead to change.

Can I tell other people about the study?

At each focus group it will be emphasised that comments made during the focus group session should be kept confidential. However it is possible that some participants may repeat comments outside of the group at some time in the future. Therefore, we encourage you to be as honest and open as you can, but remain aware of our limits in protecting confidentiality.

What if I require further information?

If you like to find out more about this research program or have any questions or comments about participating in the housing focus group study please contact Melanie Andersen or Peter Fernando at The Sax Institute on Ph: (02) 9514 5950 or Fax: (02) 9514 9551 or email melanie.andersen@saxinstitute.org.au or peter.fernando@saxinstitute.org.au.

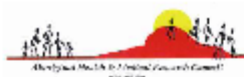
What if I have a complaint or concerns about the research?

Any person with concerns or complaints about the conduct of a research study can contact the AHMRC Ethics Committee (Ph: (02)9212 4777, Fax: (02) 9212 7211 or ethics@ahmrc.org.au) or the Ethics Officer, Research Services at The University of New South Wales (Ph: (02) 9385 7251 Fax: (02) 9385 6648 or email: anna.dsouza@unsw.edu.au).

Appendix B – Participant Consent Form, Chapters 1 and 2



The University of Sydney
School of Public Health
Faculty of Medicine



the sax institute
RESEARCH PARTNERSHIPS FOR BETTER HEALTH

**STUDY OF ENVIRONMENT, ABORIGINAL RESILIENCE AND CHILD HEALTH (SEARCH)
Housing Study**

I,
have consented to participate in the above research project on the following basis:

1. I have received the Participant Information Statement and have had the opportunity to ask questions. I understand the purpose of the research and my involvement in it.
2. I have the right to withdraw my consent and cease any further involvement in the research project at any time without giving reasons and without any penalty. This will not affect any services that I receive.
3. Any information I provide during the course of this research will remain confidential. Where the results of the research are published, my involvement and my personal results will not be identified
4. I understand that if I have any complaints or questions concerning this research project I can contact Peter Fernando (02 9514 5969) or the Chairperson of the AH&MRC or University of Sydney Ethics Committees as follows:

The Chairperson
AH&MRC Ethics Committee
P.O. Box 1565
Strawberry Hills NSW 2012
Telephone: 9212 4777

Ethics Administration
The University of Sydney
Ph: 9351 4811
Fax: 9351 6706
email: gbriody@mail.usyd.edu.au

Name:

Signature **Date**

Witnessed by **Date**

SEARCH Housing Auditor signature :

Date

Appendix C – SEARCH Participant Information Form, Chapters 2 and 3



PARTICIPANT INFORMATION SHEET – CARERS

Study of Environment on Aboriginal Resilience and Child Health (SEARCH)

What is the Study of Environment on Aboriginal Resilience and Child Health (SEARCH)?

SEARCH is a NSW based study that looks at what causes health and illness in Aboriginal children and adolescents living in urban communities. The study focuses on *healthy environments* and *child health problems*. The study will particularly look at injury; ear infections; vaccinations; mental health; asthma; and risk factors for later chronic diseases.

Some general things you might want to know about this research

You are being asked to take part in SEARCH. Participating in this study is voluntary. You may decline to participate, or you may withdraw your consent to be in the study, for any reason, at any time. It is important that you understand the information on this sheet so that you can make an informed choice about participating in SEARCH. This information sheet is for you to keep and you will also be given a copy of your consent form. If you have any questions about this study at any time, please contact the researchers listed at the end of this form, or speak to your interviewer.

Who is carrying out the study?

SEARCH is led by the Aboriginal Health and Medical Research Council (AHMRC), Aboriginal Medical Services, the Sax Institute, NSW Health, and leading health researchers in NSW. The study is being conducted through six participating Aboriginal Medical Services in NSW. The research team is being led by Associate Professor Jonathon Craig from the University of Sydney and Professor Sandra Eades formerly of the Sax Institute and now the Baker IDI Heart and Diabetes Research Institute.

What will happen if I take part in SEARCH?

- 1. Interview** If you take part in SEARCH you will be asked a series of questions by a trained interviewer at a time convenient to you. The interviewer will ask about each child in your family, from newborns to 17 year olds. Questions will concern each child's health and illnesses and emotional and behavioural development. You will also be asked about your own health and wellbeing and the neighbourhood and home that you live in. Children 12 years and older will be asked to fill out a separate questionnaire with assistance from the interviewer.
Must every question be answered? Since participation in SEARCH is voluntary, you can choose not to answer certain questions. However, in order for the results of the survey to be useful and meaningful, you are encouraged to answer all questions as completely as possible.
- 2. Health assessment** The interviewer will also ask to conduct a brief health assessment of your children and yourself. This will involve measuring and recording a few basic medical details such as height, weight and waist circumference. They will also undertake an ear examination using tympanometry and otoscopy.
- 3. Clinical examination** The interviewers will ask to take your children's blood pressure to look for hypertension. An audiologist will then ask to test your children's hearing and examine their ears for signs of middle ear disease (otitis media) after cleaning with tissues or wicks (if needed). Children aged between 1 and 7 years of age will have speech and language testing by a speech pathologist.
- 4. Data Linkage** In order to obtain a complete picture of the health of Aboriginal children in NSW, and to minimise the length of our surveys, the interviewer will ask your permission to access health information about your children from a number of sources: 1. Medical records from your local Aboriginal Medical Services; 2. Medical records from NSW hospitals – information related to your child's birth and any later hospital visits; 3. The Australian Childhood Immunisation Register – information regarding which

immunisations your child has received; 4. The Medicare Benefits Scheme – information on what types of health professionals your child has visited; and 5. The Pharmaceutical Benefits Scheme – information on which medications your child has been prescribed. The researcher will also ask your permission to access health information about you. This information will be used to provide a picture of the health status of the carers of Aboriginal children in NSW. The interviewer will ask permission to access: 1. Medical records from your local Aboriginal Medical Services; 2. Medical records from NSW hospitals; 3. Medicare Benefits Scheme data; and 4. Pharmaceutical Benefits Scheme data.

5. **Follow up** If you agree to participate in SEARCH, the researchers will contact you once a year for the next 5 years to see how your children's health progresses as they grow. This information will help us understand the kind of things that help children grow up to be healthy.

Can I withdraw from the study?

Participation in this study is completely voluntary - you do not have to participate in SEARCH. In addition, you are free to withdraw your consent and stop being involved in SEARCH at any time. You do not need to explain why you no longer wish to participate and this will not influence in any way the quality of health care you will receive from the AMS in the future.

Will anyone else know the results?

The results of the brief medical examination that is part of SEARCH will be provided to you, including information from the ear health assessment and speech and language development assessment. We will also provide a copy of these results to your AMS doctor unless you tell us that you would prefer us not to do this. Apart from this, all information about individuals taking part in the study will be strictly confidential, except, as required by law, if you or your children are considered to be at serious risk of harm and only the researchers will have access to information about participants. No information will be released in a way that would allow an individual to be identified. No reports of the study will identify individual participants.

Are there any risks involved?

Some of the questions you will be asked deal with sensitive issues which may effect the health and wellbeing of yourself and your children. You may find thinking about these issues upsetting. You may also become alerted to a new health problem such as hearing impairment or speech delay in your child. This may be beneficial in the long term, allowing you to engage with appropriate health care services as a result, but in the short term may be stressful. Before deciding to take part in SEARCH these risks will be fully explained to you and you will receive information about services available within your AMS to provide assistance, counselling and support should you require it. Should you become distressed during the interview, a process has been put in place in partnership with the AMS whereby you will receive prompt access to appropriate support.

Will the study benefit me?

You will benefit from this study by receiving feedback on your children's health assessment and your own. Importantly, the SEARCH study will help us to understand the health issues faced by urban Aboriginal children in NSW. It will also help us test some new ways of improving the health of Aboriginal children. Information from this study will help your AMS to better understand the health issues of children in your community and how best to meet their needs.

What if I require further information?

If you would like to find out more about SEARCH or have any questions or comments about participating in the study please contact the Sax Institute and ask for a SEARCH project officer (Tel: 02 9514 5950, Fax: 02 9514 5951 or email: search@saxinstitute.org.au.)

What if I have a complaint or concern about the research?

Any person with concerns or complaints about the conduct of a research study can contact the AHMRC Ethics Committee (phone 02 9212 4777, fax 02 9212 7211 or email ethics@ahmrc.org.au) or the Senior Ethics Officer, Ethics Administration, The University of Sydney (phone 02 9351 4811, fax 02 9351 6706 or email gbriody@mail.usyd.edu.au)

Appendix D – SEARCH Participant Consent Form, Chapters 2 and 3



Study of Environment on Aboriginal Resilience and Child Health (SEARCH)

Consent form – Child 0 - 17 (In confidence)

You are being asked to be part of this important study of the health, education and well-being of Aboriginal children, young people and their families. We are speaking with hundreds of Aboriginal families living in urban communities in NSW to help us understand how health, education and other community services can do a better job for Aboriginal people. The study is being done by the Aboriginal Health and Medical Research Council and the Sax Institute in partnership with Aboriginal Medical Services in NSW. All the information collected will be kept strictly confidential. The information on your family will only be seen by the research team. Published findings will not identify any individual or their family.

My signature shows that I give permission to:

- participate in the Study of Environment on Aboriginal Resilience and Child Health (SEARCH);
- have information about mine and my child's health included in the Study;
- the research team to access my Aboriginal Medical Service records and to follow my health and other records relating to me, including NSW hospital records, cancer records, death records and other health-related records;
- Medicare Australia releasing to the SEARCH research team my details, including Medicare number, and information concerning services provided to me under Medicare, the Department of Veterans' Affairs, the Pharmaceutical Benefits Scheme and the Repatriation Pharmaceutical Benefits Scheme, including past information, until the end of the Study or for the duration of my involvement in the Study;
- being contacted in the future to provide information on changes to my health and lifestyle. I may also be asked to provide further information including questionnaire responses or biological samples; my participation in any of these would be completely voluntary.

I give my consent on the understanding that:

- my information will only be used for the purposes outlined in the Participant Information Sheet, of which I have a copy;
- my information will be kept strictly confidential and will be used for health research only;
- reports and publications from the Study will be based on de-identified information and will not identify any individual taking part;
- my participation in this Study is entirely voluntary and my consent will continue to be valid following death or disablement unless withdrawn by my next of kin or other person responsible. I am free to withdraw from the Study at any time by calling the Sax Institute on 02 9514 5950;
- my decision on whether or not to take part in the Study or in any additional research will not disadvantage me or affect my future health care in any way.

Parent / Caregiver:

Full name (please print) Signature Date

Participant:

Full name (please print) Date of Birth of Participant

This Study is voluntary and you are free to withdraw your permission at any time for all or part of the survey. If you have any questions or would like more information about the survey you can contact the SEARCH team. (telephone 02 9514 5950 or fax 02 9514 5951).

Form D. Child 0-17 Consent

Appendix E – Analysis variables and question sources, Chapter 4

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Carer Demographics	Age	1a. Age __ years	-	Age in years	[numeric value, discrete number]
	Gender	1b. Sex	-	Male; Female	0 - Male # 1- Female
	Aboriginal and Torres Strait Islander Status	1c. Are you of Aboriginal or Torres Strait Islander descent?	Census	Yes, Aboriginal; Yes, Torres Strait Islander; Yes, Aboriginal & Torres Strait Islander; No	0 - non-Aboriginal # (no) 1 - Aboriginal (Yes to any)
	ACCHS	[site noted by research officer]	-	A; B; C; D	0 - A #, 1 - B, 2 - C, 3 - D
Socioeconomic Status	Qualifications	2b. What qualifications do you have?	WAACHS	None; Trade/apprenticeship; Certificate from college; Diploma (beyond Year 12); Bachelor Degree; Post Graduate diploma/higher degree; Other	0 - Bachelor or postgraduate degree# 1 - Trade, certificate, diploma 2 - None
	Employment Status	3a. How would you describe your current employment status?	NSW CHS	Employed full-time (incl self-employed); Employed part-time (incl self-employed); Unemployed; Student and working; Student and not working; Home duties; Retired; Unable to work due to health problems; Other	0 – Employed # (full time or part time) 1 - Studying (student working or not working) 2 - Home duties 3 - Not working (unemployed, retired or unable to work due to health problems)
	Fortnightly income	3c. Which of these groupings would best describe your HOUSEHOLD'S income for the past 2 WEEKS from all sources (e.g. wages, CDEP, pensions and study allowances etc)?	WAACHS	\$1-199; \$200-399; \$400-599; \$600-799; \$800-1999; \$2000 and over; None; Other	0 - \$2000+ # 1 - \$800-1000 2 - \$0-799

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Tenure Type	Tenure Type	19. Is your current home:	WAACHS NATSISS AHS	a. Owned by you or any usual member of this household; b. being paid off by you or any usual member of this household; c. rented by you or any usual member of this household; d. owned by the department of housing; e. Owned by Aboriginal Housing Office; f. Owned by Community Housing (Land Council, other Aboriginal housing provider or other community housing provider); g. Other	0 - Owned (a or b) # 1 - Private rent (c) # 2 - Social housing (d, e, f)
Dwelling Structure	Dwelling Structure	15. What best describes your current housing?	WAACHS NATSISS AHS	House; Flat, unit, apartment; Other	0 – House # 1 – Apartment (NB 'House' includes townhouse)
Mobility	Number of years in current home	16. How long have you lived there?	New	__ Years and __ Months	[numeric value – discrete number of months, expressed as years]
	Number of houses child lived in since birth ¥	Q4. <i>Child Health Survey.</i> <i>Since _____ was born, how many different houses has he/she lived in?</i>	WAACHS (Child Survey)	__ Number	[numeric value – discrete] 0 - 1-3 homes # 1 - 4+ homes
	Forced to move in past 12 months	13. Have any of these issues affected you and your family in the past 12 months? You were forced to move out of a place you were living for any reason.	WAACHS	No; Yes	0 – No # 1 – Yes

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Household Occupancy	Number of usual residents	17. How many people usually sleep in your current home?	WAACHS NATSISS AHS	__ People	[numeric value – discrete]
	Number of Bedrooms	18. How many bedrooms are in your home?	WAACHS NATSISS AHS	__ Bedrooms	[numeric value – discrete]
	People Per Bedroom (PPB)	Derived variable from 17 & 18: number of usual residents divided by number of bedrooms	Derived, as per LSIC	Ratio: people/bedroom	[continuous ratio] 0 - 2 or fewer PPB # 1 - >2 PPB (>2 PPB considered crowded, as per first condition of Canadian National Occupancy Standard (CNOS))
	Subjective Crowding	13. Have any of these issues affected you and your family in the past 12 months? You have felt crowded in where you lived	WAACHS	No; Yes	0 – No # 1 – Yes
	Home too big	20. Does the home that you live in have any of the following problems: a. Too big	AHS	No; Yes	0 – No # 1 – Yes
	Home too small	20 b. Too small	AHS	No; Yes	
Affordability	Affordability problems	Derived variable from 20 Does the home that you live in have any of the following problems: d. Rates too expensive e. Mortgage too expensive f. Rent too expensive	AHS	No (if no to d, e & f); Yes (if yes to d, e or f)	0 – No # 1 – Yes

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Dwelling Quality	Major cracks in walls/floors	20 i. Major cracks in walls or floors	NATSISS, AHS	No; Yes	0 – No # 1 – Yes
	Sinking/moving foundations	20 j. Sinking/moving foundations	NATSISS, AHS	No; Yes	0 – No # 1 – Yes
	Sagging floors	20 k. Sagging floors	NATSISS, AHS	No; Yes	0 – No # 1 – Yes
	Walls or windows not straight	20 l. Walls or windows not straight	NATSISS, AHS	No; Yes	0 – No # 1 – Yes
	Wood rot/termite damage	20 m. Wood rot/termite damage	NATSISS, AHS	No; Yes	0 – No # 1 – Yes
	Structural problems (*Domain)	Derived variable from Q 20 i-m	Derived	No (if no to 20 i-m) Yes (if yes to one or more of 20 i-m)	0 – No # 1 – Yes
	Rising damp	20 g. Rising damp	NATSISS, AHS		0 – No # 1 – Yes
	Damp/mildew on walls, ceilings, windows	20 h. Damp or mildew on any of the walls, ceilings or windows	New		0 – No # 1 – Yes
	Damp or mildew (*Domain)	Derived variable from Q 20 g, h	Derived	No (if no to 20 g, h) Yes (if yes to one or both of 20 g, h)	0 – No # 1 – Yes
	Major electrical problems (*Domain)	20 n. Major electrical problems	NATSISS, AHS	No; Yes	0 – No # 1 – Yes
	Major plumbing problems (*Domain)	20 o. Major plumbing problems	NATSISS, AHS	No; Yes	0 – No # 1 – Yes
	Vermin (*Domain)	20 p. Cockroaches, mice or other	New	No; Yes	0 – No # 1 – Yes
	Needs to be more secure (*Domain)	20 c. Needs to be more secure	AHS	No; Yes	0 – No # 1 – Yes
	Unable to make home warm enough in winter	21. Are you able to make your home warm enough in winter?	New	No; Yes	0 – No 1 – Yes #
	Unable to make home cool enough in summer	22. Are you able to make your home cool enough in summer?	New	No; Yes	0 – No 1 – Yes #

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Dwelling Quality (Cont'd)	Temperature control (*Domain)	Derived variable from 21 & 22	Derived	No to either 21 or 22 = yes to temperature control problem	0 – No # 1 – Yes
	No functioning smoke alarm (*Domain)	23. Is there a functioning smoke alarm installed in your home?	New	No; Yes	0 – No 1 – Yes #
	Number of Physical Dwelling Problems (of 8 Domains)	Derived variable – tally of number of physical dwelling problems from each *Domain	Derived	Score 1 for every physical dwelling problem *Domain	[numeric value – discrete, score 0-8] 0 - 0-2 problems # 1 - 3+ problems

referent category

*8 Physical Dwelling Problem Domains (structural, damp or mildew, electrical, plumbing, no smoke alarm, security, vermin & temperature control)

¥ note that models including number of houses lived in since birth were also adjusted for child age in months, a variable derived from the child health survey child date of birth question and date of survey.

AHS: Australian Housing Survey, LSIC: Longitudinal Study of Indige

nous Children, NATSISS: National Aboriginal and Torres Strait Islander Social Survey, NSW CHS: New South Wales Child Health Survey, WAACHS: Western Australian Aboriginal Child Health Survey, New: designed specifically for SEARCH in consultation with ACCHS, investigators and key stakeholders

Appendix F – Analysis variables and question sources, Chapter 5

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Community Factors	ACCHS	[site noted by research officer]	-	A; B; C; D	0 - A #, 1 - B, 2 - C, 3 - D
Child factors (child survey)	Age	1a. Age __ years	WAACHS	Derived from the child date of birth and date of child survey	[numeric value]
	Sex	Sex	WAACHS	Male; Female	0 - Male # 1 - Female
	Breastfed for 6 months or more	(0-3yrs) Including times of weaning, what is the total time that ____ was breastfed? (4-17yrs) How long was ____ breastfed?	NSW CHS WAACHS	__ months; Still being breastfed; Less than 1 week	0 - Less than 6 months 1 - 6 months or more #
	Prenatal maternal smoking	During the pregnancy with ____ did you/ did ____'s mother smoke cigarettes?	WAACHS	No; Yes	0 - No # 1 - Yes
	Serves of vegetables per day	How many serves of vegetables does ____ usually eat each day? (a serve = ½ cup cooked or 1 cup salad vegetables)	NSW CHS	Does not eat vegetables; Less than 1 serve; 1 serve; 2 serves; 3 serves; 4 serves; 5 serves or more	0 - 0-1 serves 1 - 2 or more #
	Serves of fruit per day	How many serves of fruit does ____ usually eat each day? (a serve = 1 medium fruit or 1 small piece of fruit or ½ cup diced pieces)	NSW CHS	Does not eat fruit; Less than 1 serve; 1 serve; 2 serves; 3 serves; 4 serves; 5 serves or more	0 - 0-1 serves 1 - 2 or more #
	Ever attended childcare or preschool	Has __ ever attended formal childcare or preschool?	Derived from NSW CHS and WAACHS	No; Yes, currently attending Yes, used to attend	0 - No # 1 - Yes
	Number of houses child lived in since birth ¥	Since _____ was born, how many different houses has he/she lived in?	WAACHS	__ Number	[numeric value – discrete] 0 - 1-3 homes # 1 - 4+ homes

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Health Outcome Measures	Recurrent gastrointestinal infection ever	Q9/ 19. I am going to read you a list of health problems that some children have. Please tell me if ___ has any of them: b. Recurring gastro infection. (i) Ever had	WAACHS	Yes; No	0 - No # 1 - Yes
	Recurrent gastrointestinal infection treated in the past month	Q9/19 b. Recurring gastro infection (iii) Treated in last month	Extension question	Yes; No	0 - No # 1 - Yes
Household-level factors (carer survey)	Household income per fortnight	Which of these groupings would best describe your HOUSEHOLD'S income for the past 2 WEEKS from all sources (e.g. wages, CDEP, pensions and study allowances etc)?	WAACHS	\$1-199; \$200-399; \$400-599; \$600-799; \$800-1999; \$2000 and over; None; Other	0 - \$2000+ # 1 - \$800-1000 2 - \$0-799
	Carer Kessler 10 score*	Standardised measure of psychological distress *	NSW CHS	[score]	0 - Less than 22 # 1 - 22 or more
	Any household smoking	How many of the people who live there smoke inside your home?	WAACHS	[number]	0 - No # (0 people) 1 - Yes (1 or more people)

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Household-level factors (carer survey) (Cont'd)	Tenure Type	Is your current home:	WAACHS NATSISS AHS	a. Owned by you or any usual member of this household; b. being paid off by you or any usual member of this household; c. rented by you or any usual member of this household; d. owned by the department of housing; e. Owned by Aboriginal Housing Office; f. Owned by Community Housing (Land Council, other Aboriginal housing provider or other community housing provider); g. Other	0 - Owned (a or b) # 1 - Private rent (c) # 2 - Social housing (d, e, f)
	Housing affordability problem	Derived variable from Q. 20 Does the home that you live in have any of the following problems: d. Rates too expensive e. Mortgage too expensive f. Rent too expensive	AHS	No (if no to d, e & f); Yes (if yes to d, e or f)	0 - No # 1 - Yes
	Forced to move in past 12 months	Have any of these issues affected you and your family in the past 12 months? You were forced to move out of a place you were living for any reason.	WAACHS	No; Yes	0 - No # 1 - Yes
	Duration of residence in current home	How long have you lived there?	New	__ Years and __ Months	[numeric value – discrete number of months, expressed as years]
	Number of usual residents	Q 17. How many people usually sleep in your current home?	WAACHS NATSISS AHS	__ People	0 - 1-5 1 - 6 or more

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Household-level factors (carer survey) (Cont'd)	People per bedroom (PPB) (*Domain)	Derived variable from: Q 17. How many people usually sleep in your current home? Q 18: How many bedrooms are in your home?	Derived, as per LSIC	Ratio: people/ bedroom	0 - 2 or fewer PPB # 1 - >2 PPB (>2 PPB considered crowded, as per first condition of Canadian National Occupancy Standard (CNOS))
	Subjective Crowding (*Domain)	Have any of these issues affected you and your family in the past 12 months? You have felt crowded in where you lived	WAACHS	No; Yes	0 - No # 1 - Yes
	Major plumbing problems (*Domain)	20 o. Major plumbing problems	NATSISS, AHS	No; Yes	0 - No # 1 - Yes

CONSTRUCT	VARIABLE NAME	SURVEY QUESTION	QUESTION SOURCE	RESPONSE OPTIONS	ANALYSIS CATEGORIES/ RANGE
Household-level factors (carer survey) (Cont'd)	Structural problems (*Domain)	Derived variable from: 20 i. Major cracks in walls or floors 20 j. Sinking/moving foundations 20 k. Sagging floors 20 l. Walls or windows not straight 20 m. Wood rot/termite damage	Derived from NATSISS, AHS	No (if no to 20 i-m) Yes (if yes to one or more of 20 i-m)	0 - No # 1 - Yes
	Major electrical problems (*Domain)	20 n. Major electrical problems	NATSISS, AHS	No; Yes	0 - No # 1 - Yes
	Damp or mildew (*Domain)	Derived variable from: 20 g. Rising damp 20 h. Damp or mildew on any of the walls, ceilings or windows (new)	Derived from g. NATSISS, AHS h. new	No (if no to 20 g, h) Yes (if yes to one or both of 20 g, h)	0 - No # 1 - Yes
	Vermin (*Domain)	20 p. Cockroaches, mice or other	New	No; Yes	0 - No # 1 - Yes
	Unable to make home warm enough in winter (*Domain)	Are you able to make your home warm enough in winter?	New	No; Yes	0 - No 1 - Yes #
	Number of Housing Problems (of 8 Domains*)	Derived variable – tally of number of housing problems from each *Domain	Derived WAACHS, NATSISS, LSIC, AHS	Score 1 for every crowding and physical dwelling problem domain, as marked *Domain	[numeric value – discrete, score 0-8] 0 - 0-2 problems # 1 - 3+ problems

referent category

* Number of Housing Problems (Domains: structural, damp or mildew, electrical, plumbing, vermin, home not warm, PPB >2, felt crowded)

¥ Question from SEARCH Child health survey, either 0-3 or 4-17 depending on child age

AHS: Australian Housing Survey, LSIC: Longitudinal Study of Indigenous Children, NATSISS: National Aboriginal and Torres Strait Islander Social Survey, NSWCHS: New South Wales Child Health Survey, WAACHS: Western Australian Aboriginal Child Health Survey, New: designed specifically for SEARCH in consultation with ACCHS, investigators and key stakeholders

* K10 validated for use with Aboriginal adults. McNamara BJ, Banks E, Gubhaju L, et al. Measuring psychological distress in older Aboriginal and Torres Strait Islanders Australians: a comparison of the K-10 and K-5. Aust N Z J Public Health 2014;38(6):567-73. doi: 10.1111/1753-6405.12271.

Appendix G – Further detail on statistical methods, Chapter 5

Regression models

The prevalence ratios presented in Table 2 and Fig. 1 were derived from multilevel log-binomial regression models that take into account the clustering of children within families. Using subscripts i and j to index children and families, respectively, these models have the form:

$$\begin{aligned} y_i &\sim \text{Bin}(\pi_i, 1) \\ \ln(\pi_i) &= \beta_0 + \alpha_{j[i]} + X_i \gamma \\ \alpha_j &\sim N(0, \sigma^2) \end{aligned}$$

where y_i is equal to 1 if child i ever had a recurrent gastrointestinal infection (or was treated for a recurrent gastrointestinal infection in the past month) and 0 otherwise, β_0 is an intercept term, $j[i]$ corresponds to child i 's family, α_j is a random effect for family j , X_i is a row vector of explanatory variables (including the housing exposure of interest and any covariates), and γ is a column vector of regression coefficients. All models were fitted using the MCMC procedure in SAS ver. 9.3 (SAS Institute, Cary, NC, USA), specifying diffuse $N(0, 10^4)$ priors for β_0 and the coefficients in γ , and an uninformative $\text{Uniform}(0, 100)$ prior for the standard deviation of the family-level errors, σ (Gelman, 2006). Model fit was assessed via posterior predictive simulation (Gelman et al., 2014), using the unweighted sum of squares as a discrepancy measure (Copas, 1989). Posterior predictive p -values for all models were well within the range 0.05–0.95, indicating reasonable overall fit.

Multiple imputation analyses

Multilevel multiple imputation analyses were performed using REALCOM Impute (Carpenter et al., 2011). We fitted two sets of imputation models to the SEARCH baseline data, one set for ever had a recurrent gastrointestinal infection, and another set for recurrent gastrointestinal infection treated in the past month. Each set of

models included a model in which the total number of physical housing problems (i.e., the physical dwelling problems score) was coded as a binary variable (0–2 problems, or ≥ 3 problems), and a model in which the total number of physical housing problems was treated as a continuous variable; i.e., we fitted a total of four models.

The model for ever had a recurrent gastrointestinal infection in which the physical dwelling problems score was treated as a binary variable included two completely-observed predictors (age group, sex) and six partially-observed response variables (recurrent gastrointestinal infection, prenatal maternal smoking, breastfeeding at 6 months, ever attended childcare or preschool, vegetable intake per day, and fruit intake per day) at the child level, and one completely-observed predictor (recruiting ACCHS) and 13 partially-observed response variables (household income, carer psychological distress, household smoking, and the 10 housing exposures in Table 2) at the family level (note that recruiting ACCHS was used as a predictor for the child- and family-level responses). All partially-observed variables were modelled using the latent normal variable approach for binary and ordinal responses described in Goldstein et al. (2009) and Carpenter and Kenward (2013). The corresponding model for recurrent gastrointestinal infection treated in the past month did not include prenatal maternal smoking, vegetable and fruit consumption, carer psychological distress, or household smoking (these variables were not included in the regression analyses), but was otherwise the same as the model for ever had a recurrent gastrointestinal infection.

For both ever had a recurrent gastrointestinal infection and recurrent gastrointestinal infection treated in the past month, the imputation models in which the total number of physical housing problems was treated as a continuous variable were similar to those in which the physical dwelling problems score was coded as a binary variable, except that they did not include other housing exposures as partially-observed family-level responses (i.e., only the physical dwelling problems score and the socio-demographic and health factors were included in the imputation models).

Ten complete data sets, comprising observed and imputed survey responses, were generated from each fitted imputation model, as described by Goldstein et al. (2009).

The multilevel log-binomial regression models for gastrointestinal infection prevalence and housing conditions were then fitted to each complete data set using the MCMC procedure in SAS ver. 9.3 (see *Regression models* above). Estimates of the associations between housing conditions and the prevalence of recurrent gastrointestinal infections, derived from the combined posterior samples for each of the 10 data sets (see Table S1, Fig. S1), were qualitatively similar to those in Table 2 and Fig. 1 of the paper.

References

- Carpenter, J. R., Goldstein, H., Kenward, M. G., 2011. REALCOM-IMPUTE software for multilevel multiple imputation with mixed response types. *Journal of Statistical Software*. 45, 1–14.
- Carpenter, J. R., Kenward, M. G., 2013. *Multiple imputation and its application*. John Wiley & Sons; Chichester, UK.
- Copas, J. B., 1989. Unweighted sum of squares test for proportions. *Journal of Applied Statistics*. 38, 71–80.
- Gelman, A., 2006. Prior distributions for variance parameters in hierarchical models. *Bayesian Analysis*. 1, 515–533.
- Gelman, A., Carlin, J. B., Stern, H. S., Dunson, D. B., Vehtari, A., Rubin, D. B., 2014. *Bayesian data analysis*. CRC Press; Boca Raton.
- Goldstein, H., Carpenter, J., Kenward, M. G., Levin, K. A., 2009. Multilevel models with multivariate mixed response types. *Journal of Statistical Modelling*. 9, 173–197.

Appendix H – Table 5.S1 Multiple Imputation Analyses, Chapter 5

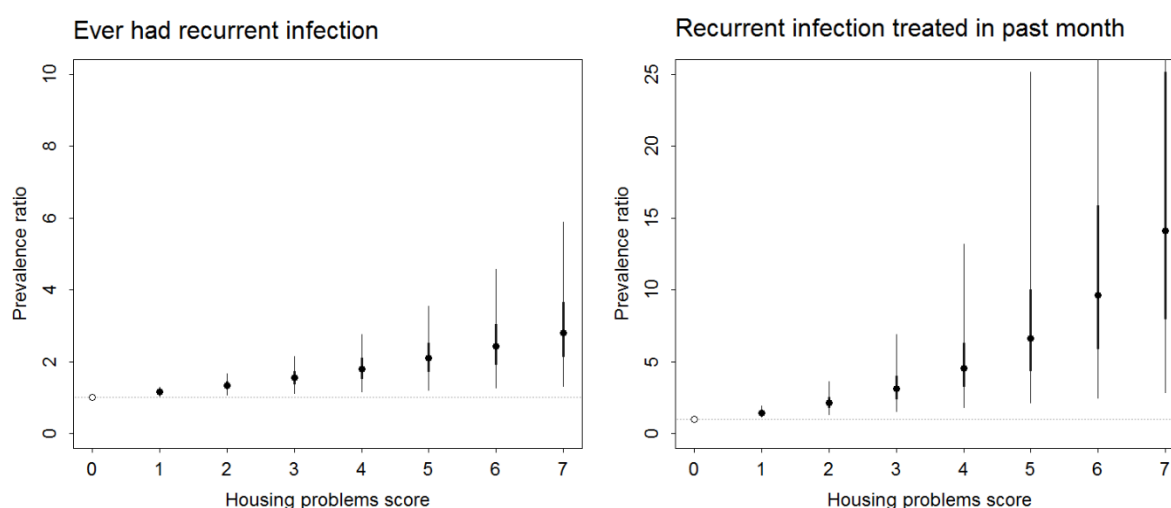
Associations between recurrent gastrointestinal infection and housing estimated in the multiple imputation analyses (housing exposures examined separately).

Housing exposure	Ever had a recurrent gastrointestinal infection			Recurrent gastro. infection treated in the past month		
	Total (n) ¹	% ever had (n)	Adjusted PR (95% int.) ²	Total (n) ¹	% treated (n)	Adjusted PR (95% int.) ³
Major plumbing problems						
No	1114	10.50 (117)	1	1093	2.65 (29)	1
Yes	194	17.01 (33)	1.65 (1.01–2.58) *	187	3.74 (7)	1.91 (0.54–5.79)
Structural problems						
No	791	9.48 (75)	1	780	1.92 (15)	1
Yes	528	14.58 (77)	1.61 (1.11–2.41) *	510	4.31 (22)	3.18 (1.45–8.38) *
Electrical problems						
No	1118	11.63 (130)	1	1095	2.92 (32)	1
Yes	177	10.17 (18)	0.92 (0.52–1.61)	175	2.86 (5)	1.64 (0.46–5.36)
Damp or mildew						
No	846	9.93 (84)	1	830	2.29 (19)	1
Yes	479	13.57 (65)	1.55 (1.03–2.31) *	467	3.85 (18)	2.21 (0.94–5.43)
Vermin						
No	755	12.05 (91)	1	736	1.77 (13)	1
Yes	574	10.63 (61)	1.02 (0.70–1.50)	565	4.25 (24)	3.25 (1.37–8.52) *
Unable to keep home warm in winter						
No	1079	10.94 (118)	1	1054	2.28 (24)	1
Yes	235	12.77 (30)	1.29 (0.78–2.08)	232	5.17 (12)	3.20 (1.26–8.52) *
Number of usual residents						
0–5	805	13.54 (109)	1	784	3.19 (25)	1
6 or more	515	7.57 (39)	0.64 (0.41–0.98) *	510	2.16 (11)	0.63 (0.22–1.47)
Felt crowded in past 12 months						
No	910	9.89 (90)	1	891	2.36 (21)	1
Yes	413	15.01 (62)	1.56 (1.04–2.32) *	404	3.96 (16)	1.58 (0.67–3.72)
People per bedroom						
0–2	1144	10.75 (123)	1	1121	2.68 (30)	1
>2	175	13.71 (24)	1.64 (0.91–2.89)	172	3.49 (6)	1.35 (0.39–4.51)
Physical dwelling problems score						
0–2	748	9.49 (71)	1	736	1.63 (12)	1
3 or more	423	14.18 (60)	1.59 (1.03–2.45) *	416	5.29 (22)	4.08 (1.80–10.59) *

¹ Number of children with non-missing data on recurrent gastrointestinal infection; ² Adjusted for age, sex, recruiting ACCHS, household income, carer Kessler 10 score, prenatal maternal smoking, breastfed for 6 months or more, serves of vegetables per day, serves of fruit per day, ever attended childcare or preschool, any household smoking; ³ Adjusted for age, sex, recruiting ACCHS, household income, breastfed for 6 months or more, ever attended childcare or preschool; * 95% Credible Interval does not cross 1.

Appendix I – Figure 5.S1 Multiple Imputation Analyses, Chapter 5

Relationship between recurrent gastrointestinal infection and number of housing problem domains estimated in the multiple imputation analyses.



Relationship between the prevalence of recurrent gastrointestinal infection and the total number of housing problems (the number of housing problem score, treated as a continuous predictor). Prevalence ratios were calculated using a problem score of 0 as the reference value (open circle), adjusting for age, sex, recruiting ACCHS, household income per fortnight, breastfed for 6 months or more (or current breastfeeding for children aged under 6 months), and ever attended childcare or preschool. Prevalence ratios for ever had a recurrent gastrointestinal infection were also adjusted for carer psychological distress (Kessler 10 score), serves of vegetables per day, serves of fruit per day, prenatal maternal smoking, and any household smoking. 95% credible intervals are indicated by thin error bars; heavy error bars correspond to 50% credible intervals. Note different scales on the vertical axes.

Appendix J – STROBE statement for reports of cross-sectional studies,

Chapter 4

	Item No	Recommendation	Page
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	109
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	109
Introduction			
Background/ rationale	2	Explain the scientific background and rationale for the investigation being reported	110-113
Objectives	3	State specific objectives, including any prespecified hypotheses	113
Methods			
Study design	4	Present key elements of study design early in the paper	109, 113, 116
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	114
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	114
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	115-116
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	115, Appendix E
Bias	9	Describe any efforts to address potential sources of bias	116-117
Study size	10	Explain how the study size was arrived at	(117 & see SEARCH protocol paper: The SEARCH Investigators, 2010)

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	115-116 (groupings shown in tables 4.1-4.3 and Appendix E)
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	116-117
		(b) Describe any methods used to examine subgroups and interactions	116-117
		(c) Explain how missing data were addressed	117
		(d) If applicable, describe analytical methods taking account of sampling strategy	116-117
		(e) Describe any sensitivity analyses	-
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study and analysed	114, 117
		(b) Give reasons for non-participation at each stage	-
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	117-119, 125 Tables 4.1 - 4.3
		(b) Indicate number of participants with missing data for each variable of interest	Tables 4.1 - 4.3
Outcome data	15*	Report numbers of outcome events or summary measures	120 -125 Tables 4.1 - 4.3
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	117-125 Tables 4.1 - 4.3
		(b) Report category boundaries when continuous variables were categorized	116, 120, 124 Tables 4.1 - 4.3 Appendix E
		(c) If relevant, consider translating estimates of relative risk into absolute risk	-

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	-
Discussion			
Key results	18	Summarise key results with reference to study objectives	125-131
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	131-132
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	125-134
Generalisability	21	Discuss the generalisability (external validity) of the study results	131-132
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	134

Appendix K – STROBE statement for reports of cross-sectional studies, Chapter 5

	Item No	Recommendation	Page
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	138, 139
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	139
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	140-141
Objectives	3	State specific objectives, including any prespecified hypotheses	141
Methods			
Study design	4	Present key elements of study design early in the paper	138, 139
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	139, 141-142
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	141-142
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	142-143 Appendix F
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	142-143 Appendix F
Bias	9	Describe any efforts to address potential sources of bias	143-144 Appendix G
Study size	10	Explain how the study size was arrived at	144 & see SEARCH protocol paper: The SEARCH Investigators, 2010)
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	143 Appendix G, Tables 5.1 & 5.2

Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	143-144 Appendix G
		(b) Describe any methods used to examine subgroups and interactions	143-144 Appendix G
		(c) Explain how missing data were addressed	144 Appendix G
		(d) If applicable, describe analytical methods taking account of sampling strategy	144 Appendix G
		(e) Describe any sensitivity analyses	144 Appendix G
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study and analysed	144
		(b) Give reasons for non-participation at each stage	-
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	144 Tables 5.1 & 5.2
		(b) Indicate number of participants with missing data for each variable of interest	Tables 5.1 & 5.2
Outcome data	15*	Report numbers of outcome events or summary measures	144-148 Tables 5.1 & 5.2
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	143-149 Table 5.2 Figure 5.1 Appendices H & I
		(b) Report category boundaries when continuous variables were categorized	143 Table 5.2
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Appendices G-I

Discussion			
Key results	18	Summarise key results with reference to study objectives	149-153
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	152-153
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	149-154
Generalisability	21	Discuss the generalisability (external validity) of the study results	152
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	154