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Home, Space and Place: A review of Māori and Indigenous literature contributing to dementia-friendly housing design

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Disclaimer

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Contents

	Glossary	
	Executive Summary	i
1	Introduction	1
2	Research Purpose, Focus and Methods	3
2.1	Research Focus	4
2.2	Research Method	5
2.3	Research Steps	6
3	Literature Overview	8
3.1	Country Focus	9
3.2	Author Disciplines	9
3.3	Types of Housing	10
3.4	Approaches and Methods	10
4	Key Themes – Living with Dementia	11
4.1	The Importance of Cultural Factors in Understanding Living with Dementia	11
4.2	Housing and Care Provision	12
4.3	Housing Adequacy	13
5	Building Design Principles	14
5.1	Culturally Appropriate Design	14
5.2	Connections to Land and Place	14
5.3	A Holistic Approach	15
5.4	Co-creation and Community Engagement	15
5.5	Capability Building	16
5.6	Sustainable Housing	16
5.7	Building Design Guidelines	16
5.8	Building Design Principles for Older People	18
6	Dementia-Friendly Building Design	23
6.1	Efficacy of Building Solutions	25
7	Research Opportunities for the Development of Dementia-friendly Housing for Māori	27

	Appendix 1: Search Parameters and Terms Used for the General Literature Review	29
	Appendix 2: Annotated Bibliography: Dementia-Friendly Building Design Solutions	30
	Appendix 3: Supporting References	38

Infoboxes

Infobox 1	Summary of literature characteristics and research themes	7
Infobox 2	Building Design Guidelines	18
Infobox 3	Building Design Specifically Relating to Older People	22
Infobox 4	Dementia-friendly Residential Care Design Principles for Aboriginal Communities	24

Tables

Table 1	Country Origin of References	9
Table 2	Author Disciplines	9

Figures

Figure 1	Māori and Indigenous Dementia-friendly Housing Topic Areas	8
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Glossary

Building design – architectural, engineering and technical aspects of designing a building, such as its siting, size, floorplan, structure, layout, materials, fixtures and fittings (e.g. doors, windows, hardware), utilities services (e.g., lighting, heating, water, power) and the building's relationship to the site.

Building design solutions – building features that improve people's ability to use the building, enhance their safety and meets their needs.

Carer and *caregiver* – care can be provided by formal carers through paid services, or informal caregivers such as partners, family members and friends. Where possible, the type of carer is specified in the report. Sometimes the term 'carer' is used in a reference, but it is not specified whether it refers to formal or informal caregivers.

Housing – a private dwelling that is owned or rented. This is distinguished from non-private residential care accommodation.

Residential care – non-private, institutional accommodation for people with dementia where 24 hour care is provided.

Supported housing – also termed extra-care housing. This type of housing is private housing that includes formal support services to help people to live independently.

Universal design (UD) – the design of environments that are accessible for people of all abilities and at any stage of life. Key features are: level access to the building, avoiding long narrow corridors and sharp turns, ensuring corridors and doorways are wide enough for a wheelchair, providing sufficient space around the toilet and provision for grab bars, and a 'walk in' shower. See New Zealand's universal design standard, Lifemark <https://www.lifemark.co.nz/>

Executive Summary

Designing safe and appropriate housing for Māori with dementia is not just a matter of assessing the functional, technical, costs and benefits aspects of particular building design features. This literature review of research on building solutions to improve the functionality of housing for Māori and indigenous people with dementia emphasises the fundamental importance of cultural values, worldviews and practices in both understanding dementia and in designing living environments that support the person with dementia to stay living in their own home, to access the services they need, and for their whānau or family to support them to do so.

There is a lack of research about the housing needs and building design solutions for Māori and indigenous elders with dementia. Only two dementia-friendly indigenous building design guides were found, both of which are concerned with residential care, not with housing in the community, where the majority of people with dementia live. Those guides are based on both internationally tested dementia-friendly building design principles, as well as indigenous housing design.

In considering what is needed for dementia-friendly housing, the review has examined a range of relevant New Zealand and indigenous literature, to develop a broader understanding of the role of cultural values and imperatives in housing design. Accordingly, this review includes literature on Māori and indigenous building design principles, age- and disability-friendly housing research on the housing needs and preferences of kaumātua and indigenous elders, and Māori and indigenous literature about living with dementia, in particular references giving insights into housing needs and issues. A total of 26 references were selected for detailed consideration.

Key themes

With regard to the role of housing in supporting those living with dementia, three broad themes were identified in the literature:

- *The importance of cultural factors in understanding living with dementia.* If cultural factors are not incorporated into the living environment, this can affect the person with dementia's enjoyment of their home, their ability to perform daily tasks, their ability to understand their home environment and to live safely in it.
- *Housing and the provision of care.* It is critical that housing, care and support work together in harmony. The literature notes a prevailing lack of support for family and whānau caregivers, as well as service providers' exclusion of cultural values and understandings, and concludes that this is detrimental to the wellbeing of elders, and could affect their ability to remain in their own homes.
- *Housing adequacy.* Many older Māori and indigenous people face significant housing inadequacies, including unsafe and insecure housing, overcrowding, unaffordable

housing and dwellings in disrepair. These housing deficits are particularly detrimental for those with dementia, as it affects their health, their safety, their ability to carry out daily activities, and the provision of care in the home.

Key building design principles

Sixteen building design principles for housing for older Māori and indigenous people were distilled from the literature. Dementia-friendly building design solutions need to also follow these principles:

- Cultural values, concepts and practices underpin the design.
- The connection to land, landscape and place is expressed in design.
- There is a holistic approach to design.
- Co-design is important, not only with older people expected to live in the housing, but also with their families and the wider community.
- Buildings are designed to be sustainable – environmentally, culturally, socially.
- The design provides a sense of home and community.
- The design enables the older person to maintain connections with family and whānau.
- There is ease of indoor and outdoor flow.
- Safety and security is paramount.
- The design helps the older person maintain their independence.
- The design ensures peace, quiet and privacy.
- Accessible design meets physical and sensory needs.
- Design enhances carer safety.
- Design accommodates the older person's changing needs.
- Housing providers with older tenants include tenant support as part of overall design.
- The design enables the older person to maintain connections with the wider community.

Further research

The literature reviewed considers that greater understanding of the housing and support needs for Māori and indigenous people with dementia is required, and made a number of suggestions for further research on the development of dementia-friendly housing. There is a need for kaupapa Māori research specifically about building design solutions for Māori with dementia and their whānau, in order to provide sound information and analysis to inform the provision of appropriate housing.

There is a rich platform for developing dementia-friendly housing design solutions for Māori, including international indigenous literature on culturally appropriate housing, literature on Māori building design principles and guidelines, research on ageing in Māori communities and the cultural, social, housing and economic factors affecting the wellbeing of older Māori. There are also well-established kaupapa Māori health and wellbeing frameworks that could be applied in housing design appropriate for Māori living with dementia.

1 Introduction

In New Zealand most people with dementia live in housing in the community; they do not live in residential care. Housing is a key social determinant of health and wellbeing, and a critical factor in ensuring that the full range of the needs of people with dementia, whether they are physical, health, financial, social or cultural, are met.¹ This literature review examines research on building solutions to improve the functionality of housing for Māori and indigenous people with dementia. The term dementia is an umbrella term covering a range of conditions that affect how the brain works. Dementia is complex, multi-faceted and progressive, resulting in changes in memory, thinking, behaviour, personality and emotions. In turn, those changes can affect the performance of everyday tasks, personal independence and the ways in which the home environment is experienced.²

There is growing interest in dementia research and health service development in relation to Māori and indigenous populations and from an indigenous perspective.³ As well as research relating to Māori, research from Australia, Canada and the United States is used for comparative purposes in this review. However, literature about the housing needs and building design solutions for indigenous elders living with dementia is very sparse in both its scope and coverage. In reference to Australia, one study noted that “... housing is not a central focus of the current evidence-base relating to cognitive decline and dementia in Indigenous communities “.⁴

There is only a sparse body of international research that aligns age-friendly and disability-friendly housing design with dementia-friendly housing design.⁵ This nexus is even more limited when the needs and experiences of indigenous elders are considered. Despite limitations, the international literature provides important insights into the principles and design of culturally appropriate housing. It also shows the considerable challenges, not only in establishing culturally appropriate housing to meet the needs of elders, but also in providing housing suitable for different types of disability, including dementia.

The paucity of literature about dementia-friendly housing design for Māori and indigenous peoples is a challenge for this review. Consequently, the approach has been to draw out insights for culturally appropriate dementia-friendly housing design, by examining a range of

¹ Grant, E., Zillante, G., Tually, S., Chong, A., Srivastava, A., Lester, L., Beilby, J. and Beer, A. (2016) *Housing and Indigenous people living with a disability: lived experiences of housing and community infrastructure*, AHURI Positioning Paper No.168. Melbourne: Australian Housing and Urban Research Institute Limited.

² Deloitte (2017). *Dementia Economic Impact Report 2016* New Zealand: Deloitte.

³ Dyall, L. (2014). Dementia: Continuation of health and ethnic inequalities in New Zealand. *New Zealand Medical Journal*, 127(1389): 68-81; Gabriel, M., Stirling, C., Faulkner, D. and Lloyd, B. (2014). *Future housing and support needs of people with dementia*. AHURI Positioning Paper No.159. Melbourne: Australian Housing and Urban Research Institute; Pace, J. (2013). *Meanings of memory: Understanding aging and dementia in First Nations communities on Manitoulin Island, Toronto*. (Doctoral Dissertation) McMaster University, Hamilton, Ontario.

⁴ Gabriel et al. (2014:23).

⁵ James, B. and Saville-Smith, N. (2019) *Building Solutions to Enable People with Dementia to Age in Place: A literature review*. Research report for Building Solutions research programme, Building Better Homes, Towns and Cities National Science Challenge.

relevant literature in other fields. In particular, this review has drawn on a growing research literature about Māori and indigenous housing and evidence-based publications on Māori and indigenous housing design principles and guidelines. This report does not purport to be an extensive review of Māori and indigenous housing research; the references included in this review have been considered for the insights they provide about housing for kaumātua and elders, and particularly those with a disability.

This review sits alongside a review of general literature on building solutions to improve the functionality of homes for people with dementia: *Building Solutions to Enable People with Dementia to Age in Place: A literature review*.⁶ That report is termed the ‘general review’ when referred to in this report. The general review covers New Zealand and international evidence concerning building design solutions for people with dementia living in their own homes. In all, 34 studies were examined, of which 15 provided extensive reviews of the literature. That literature is not discussed in detail here, although a brief summary of evidence on the efficacy of specific building solutions is provided in Section 6.

Both reports are part of the *Building Solutions* research component of the Building Better Homes, Towns and Cities National Science Challenge. That research is designed to support affordable housing providers, procurers, designers and builders by addressing social and technical barriers to delivering affordable housing that is intended to meet changing needs, and able to deliver comfortable homes across the life cycle for our ageing communities.

This report is structured as follows:

- Section 2 presents the research purpose, focus and the method used for identification and selection of literature.
- Section 3 provides an overview of the literature covered in the review and key characteristics of the reviewed research.
- Section 4 sets out the broad themes in the literature concerning Māori and indigenous communities living with dementia.
- Section 5 describes the main building design principles evident in the literature.
- Section 6 describes key findings about dementia-friendly building design.
- Section 7 identifies opportunities for further research to develop understanding of building design solutions for Māori living with dementia.

⁶ James and Saville-Smith (2019).

2 Research Purpose, Focus and Method

The purpose of this review is to provide information about dementia-friendly building design solutions for Māori, based on research evidence. The target audience is housing providers, designers and builders, as well as iwi, hapu and whānau who are interested in how design can support older people with dementia to stay living in their homes, and which contributes to maintaining their wellbeing.

The research about dementia among Māori and indigenous groups notes a growing awareness of dementia in indigenous populations on the one hand, but also under-reporting of dementia due to a combination of cultural, social, language and historical reasons. In some indigenous populations under-reporting appears to be part of the acceptance of dementia as a natural part of ageing, or the framing of dementia as a special spiritual state, not as an illness. Sometimes there is lack of awareness of symptoms, or a lower priority is given to addressing dementia symptoms compared to complex physical health conditions. Moreover, fear that disclosure will result in stigma or discrimination can result in under-reporting.⁷ In New Zealand, inadequate dementia measurement instruments for Māori, which are not ethnically and culturally based, have also been identified as impediments to understanding the prevalence of dementia.⁸

Acknowledging those data limitations, the available data indicates that in 2016, 3,178 Māori had dementia. In line with overall expected increases for all ethnic groups as the population ages, this figure is expected to rise to around 10,000 Māori people by 2038.⁹ InterRAI data shows that Māori and Pacific peoples are more likely to have dementia than other ethnic groups.¹⁰ However, there is also evidence of no significant differences in prevalence of dementia between Māori and non-Māori.¹¹

The small body of research about Māori living with dementia focuses on the disease itself and the provision of services and care. There is no research focusing on the adequacy of housing for Māori living with dementia. We do not even know how many Māori with dementia live in housing in the community, rather than in residential care. Currently just under 70 percent of people with dementia live in housing in the community in New

⁷ Grant, et al. (2016); Jacklin, K. and Warry, W. (2012) Forgetting and Forgotten: Dementia in Aboriginal Seniors *Anthropology and Aging Quarterly* 33(1):13.

⁸ Kerse, N., Lapsley, H., Moyes, S., Zawaly, K., and Hayman, K. (2017). *Dementia: Supplementary findings from LiLACS NZ* Auckland: University of Auckland. In New Zealand research is being undertaken on culturally appropriate diagnostic tools; see Dr. Margaret Dudley's research on assessment and management of dementia for Māori. <http://www.brnz.ac.nz/news-events/addressing-the-critical-lack-of-research-into-maori-and-dementia>

⁹ Deloitte (2017).

¹⁰ This data is collected as part of assessments of older people for home-based care services or residential care. See TAS and InterRAI NZ (2017). Focus: People with dementia living at home *Annual Report 2016/17* Wellington: TAS Kahui Tuitui Tangata, InterRAI New Zealand.

¹¹ Kerse et al. (2017).

Zealand.¹² Given the propensity for Māori to prefer to care for their elders at home,¹³ it is likely that at least 70 percent of Māori with dementia are living at home.

2.1 Research Focus

The focus of this literature review is on:

Building design solutions that improve the functionality, safety and liveability of dwellings for older Māori and indigenous people with dementia or cognitive sensory compromise, who are living independently in the community.

Building design solutions can address a range of challenges that people with dementia face with their housing. Those design solutions can include appropriate lighting, use of flooring materials and colours to help with wayfinding and to identify specific spaces in the home, acoustic materials to control noise, and attention to accessibility.

This literature review is concerned with how housing can respond to the diverse needs of Māori with dementia, including their mobility and safety needs and changes in capabilities over time as their condition progresses. The focus is on research about age-friendly, disability-friendly and dementia-friendly housing design solutions, since the ageing process itself imparts physical frailty, and those experiencing dementia or other cognitive impairment often experience other disabling conditions such as visual impairment, physical disability, mental health conditions or substance abuse.¹⁴

The design solutions with which this research is concerned include building components and interior design that address:

- Building entrance and exit.
- Self-navigation.
- Individual function, day-to-day self-management and independence.
- Enjoyment and ambience of the home.
- Mitigation of behavioural issues that might lead to institutionalisation.

This review has taken a broader focus than the general review, due to the very few references found that specifically examine building solutions to improve the functionality of dwellings for Māori and indigenous peoples living with dementia. The approach has been to consider adjacent research fields, in order to identify relevant, aligned research, as well as gaps in Māori-specific knowledge. Accordingly, a range of literature was collected to develop understanding of important observations and principles in regard to culturally appropriate housing design for Māori and indigenous elders that could be applied to dementia-friendly housing design. This review considers literature concerning:

¹² Deloitte (2017).

¹³ However, this may be a less realistic option now. See Townsend, M. (2011). *Māori and dementia: Māori health professionals' perceptions of dementia, help offered and suggested improvements*. (Master's Thesis) University of Waikato, New Zealand; Williams, C. (2012). *Positive ageing in place: Older Māori in traditional and non-traditional place*. (Master's Thesis) University of Waikato, New Zealand.

¹⁴ Grant et al. (2016).

- Māori and indigenous building design principles, guidelines and tools developed with and for Māori and indigenous communities.
- Age- and disability-friendly housing research focusing on the housing needs and preferences of kaumātua and indigenous elders.
- Māori and indigenous literature about living with dementia, in particular references giving insights into housing needs and issues.

This review provides a small window into Māori housing research, but this is not its primary focus. For coverage of the field, readers can consult a number of literature reviews.¹⁵ The growing body of design guidance around neighbourhood and urban design based on kaupapa Māori principles provides a wider context but is beyond the frame of this review.¹⁶

2.2 Research Method

The thematic review method was chosen because of the diversity of the literature to be reviewed. Relevant research straddles several different fields including indigenous housing research and building design principles, age-friendly housing design and disability-friendly housing design. This diversity makes aggregation of results and the application of statistical methods of systematic review impractical and inappropriate. Accordingly, methods for conducting a qualitative review and synthesis have been used, primarily the development of descriptive and analytic themes.¹⁷ The storyline approach, which identifies the foundational theoretical and empirical work on a research topic that has developed over time, is also helpful in understanding how a body of evidence is constructed and used to influence the development of policy and practice.¹⁸ Finally, this review has elements of the scoping review approach, which seeks to characterise the size, scope, methods and content of relevant literature.¹⁹ The overall approach taken is to analyse the building design issues,

¹⁵ See for example, Menzies D. (2018). *Māori and indigenous housing annotated bibliography*. Report for Building Better Homes, Towns and Cities SRA: Kāinga Tahī, Kāinga Rua (SRA5), Wellington: BBHTC; Waldegrave, C., King, P., Walker, T., and Fitzgerald, E. (2006). *Māori housing experiences: Emerging trends and issues*. Wellington: Centre for Housing Research Aotearoa New Zealand.

¹⁶ Examples include Auckland Council, *Auckland Design Manual: Te Aranga Principles* (online resource). Available from: <http://www.aucklanddesignmanual.co.nz/design-subjects/maori-design/te-aranga-principles>; Kake, J. and Paul, J. (2018). *Evaluating the application of Māori design principles to urban neighbourhood development projects to develop a Kaupapa Maori design framework and assessment tools*. Paper prepared for 2018 Urbanism New Zealand Conference, Wellington: BBHTC.

¹⁷ Dixon-Woods, M., Bonas, S., Booth, A., Jones, D., Miller, T., Sutton, A., Shaw R., Smith J., and Young, B. (2006). How can systematic reviews incorporate qualitative research? A critical perspective *Qualitative Research* 6(1):27-44; Thomas, J. and Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews *BMC Medical Research Methodology* 8:45 <https://doi.org/10.1186/1471-2288-8-45>

¹⁸ Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., Kyriakidou, O., and Peacock, R. (2005). Storylines of research in diffusion of innovation: a meta-narrative approach to systematic review *Social Science & Medicine* 61:417-430.

¹⁹ Grant, M. and Booth, A. (2009). A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal* 26(2):91-108. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1471-1842.2009.00848.x>

themes and solutions present in the research to inform the development of dementia-friendly housing for Māori. Given that very few of the references found demonstrate evidence-based building design solutions, the focus is on identifying design guidance in the form of principles and best practice examples.

2.3 Research Steps

The main research steps were:

- Literature scoping, search and collection using specific criteria and search terms. This step included refinement of search terms.
- A set of questions with which to interrogate each selected reference was drawn up and formatted into a template.
- A summary of each selected reference was entered on to the template, according to the research questions. This formed the review database.
- The review database was analysed by identifying and coding the range of descriptive data and analytic themes within and across references.
- Finally the key principles, themes and building design solutions relevant to dementia-friendly housing for Māori and indigenous communities were identified.

Literature scope, search and selection

The review included both published research (journal articles, books etc) and grey literature, such as commissioned reports (e.g. reports for government or organisations), conference proceedings, unpublished research reports and theses. The review also included building design guidelines.

The inclusion criteria and search terms for literature followed a similar approach to that used for the general review (see Appendix 1), but also differed in important ways to reflect the substantially different literature available and the use of indigenous cultural conceptual and methodological frameworks in the literature.

Literature search was done through the websites of relevant research, university and other organisations and search engines such as Google and Google scholar. Key organisation websites searched were: the Australian Housing and Urban Research Institute, the Home Modifications Information Clearinghouse Australia, Department of Housing and Urban Development (USA), the National Collaborating Centre for Aboriginal Health Canada, and New Zealand Ministry of Health.

In total, 26 references were selected for detailed consideration. They are discussed in the following sections and presented as an annotated bibliography in Appendix 2. In addition, a small number of other references provide context, and where information from those are included in this review, they are acknowledged in footnotes and presented in the Supporting References list (Appendix 3).

Review template

Each of the 26 references was read and summarised on to a review template, which was based on the template used for the general review, but also captured additional information about Māori and indigenous building design principles, design guidelines and assessment tools. Themes in addition to those considered in the general review were identified during analysis of the content of the selected references and included in the template. The range of information collected about each reference is set out in Infobox 1. The review templates comprised the database for analysis.

Literature Characteristics	Building design themes	Additional themes
Purpose/objective	Entrance/exit	Enhancement of
Discipline	Self-navigation	carer support
Location of research	Visual cues	Family relationships
Housing – independent, supported, residential care	Spatial orientation	Elder wellbeing
New build or existing housing	Safety	Food security
Methods	Independence	Housing issues
Design principles	Ability to carry out daily activities	Sustainability
Tools	Enjoyment of home	Culturally appropriate design
Main findings	Ambience of home	
Key conclusions	Behavioural issues	
	Home modification	
	Universal design	
	Lighting	
	Acoustics	

Infobox 1: Summary of literature characteristics and research themes

3 Literature Overview

This section sets out the broad characteristics of the 26 references selected for the review. Figure 1 presents the landscape of the reviewed literature, showing the numbers of references in each key topic area.

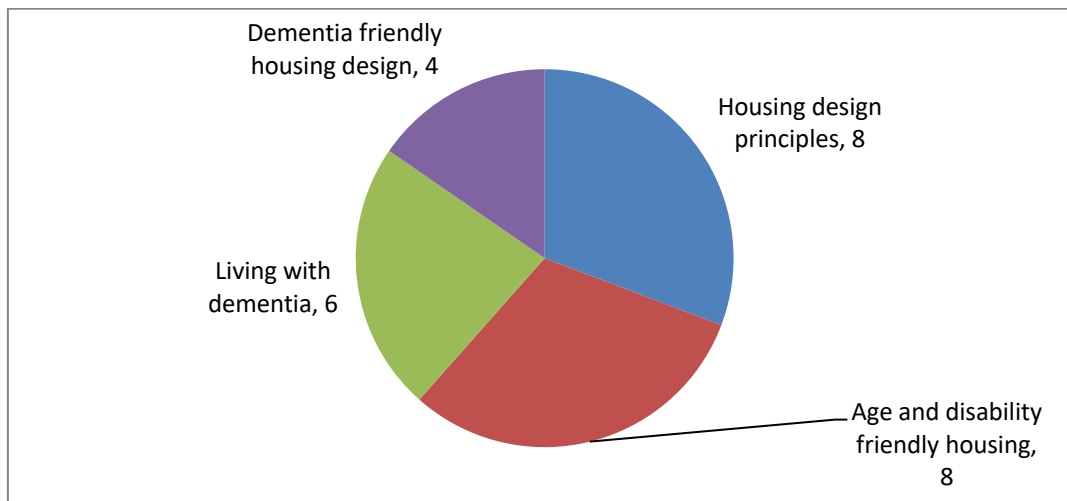


Figure 1: Māori and Indigenous Dementia-friendly Housing Topic Areas

Only four of 26 references provide information about dementia-friendly housing design. Only two of those references primarily focus on building design solutions to improve the functionality of housing for indigenous elders with dementia. Both references are concerned with building design for residential care, not for elders with dementia living in their own homes.²⁰ One New Zealand reference focuses on secure residential dementia care design and includes a section relating to bicultural design.²¹ One reference was found on the role of housing and housing design in supporting people with dementia, which included a section about the experiences of Aboriginal and Torres Strait Islanders.²² No references specifically concerned with dementia-friendly design solutions for Māori housing were found.

To provide important context to the review, the following references were also included:

- Eight references concerning Māori and indigenous building design principles and guidelines.
- Eight references concerning age- and disability-friendly housing research focusing on the housing needs and preferences of kaumātua and indigenous elders as well as those with physical disabilities.

²⁰ Fleming, R. and Bennett, K. (2017) *Applying the Key Design Principles in Environments for People with Dementia* Resource 2 Environmental Design Resources, Dementia Training Australia; Pholeros, P., Bennett, K., Welke, A. and Arch, M. (2017). *Indigenous aged care design guide: Environmental Design Resources, R6*. Dementia Training Australia.

²¹ Ministry of Health (2016) *Secure Dementia Care Home Design* Wellington: Ministry of Health.

²² Gabriel et al. (2014).

- Six references about Māori and indigenous people living with dementia that included information about housing needs and issues.

3.1 Country Focus

Table 1 sets out the country origin of references. Most of the references relate to New Zealand (11) and Australia (9). Five references relate to Canada, and one reference relates to the United States.

Country	Number of references
New Zealand	11
Australia	9
Canada	5
United States	1

Table 1: Country Origin of References

3.2 Author Disciplines

Diversity and the interrelated nature of themes are characteristic of Māori and indigenous housing literature.²³ Similarly, the literature reviewed here is inherently multi-disciplinary, multi-sectoral and multi-method, reflecting the breadth of scope and the holistic view taken of housing and dementia.

The literature brings together research from architecture, planning, health sciences and social sciences. Table 2 sets out the disciplines of authors, where these are clearly identified in the references. It is most common for authors to work in social sciences (anthropology, business studies, geography, public policy, psychology, sociology, social work – 13 references) and architecture and design (11 references). Health sciences, such as occupational therapy, nursing, public health, environmental health, clinical and community health services are represented in five references, while two references include authors with a planning background. It is notable that many of the references were written by inter-disciplinary teams, especially those comprising architecture and social sciences.

Discipline	Number of references
Social sciences	13
Architecture and design	11
Health Sciences	5
Planning	2

Table 2: Author Disciplines

²³ Long, S. Memmott, P. and T. Seelig (2007). *An audit and review of Australian Indigenous housing research*. AHURI Final Report No. 102, Melbourne: Australian Housing and Urban Research Institute; Menzies (2018).

3.3 Types of Housing

Most references are concerned with housing in the community, while five also include information about supported housing, i.e., housing that includes support services or ensures residents are able to access the services they need. Three references are focused on residential care, and all those are building design guides.²⁴

Six references only cover new builds, and one reference only covers existing dwellings. Five references cover both new and existing dwellings. One reference includes design for redevelopment of existing housing.²⁵ The remaining references do not specify a focus either on new or existing buildings.

Several references provide examples of innovative housing design based on Māori or indigenous design principles and traditional housing models.²⁶

3.4 Approaches and Methods

Those references that report on research show that both quantitative and qualitative methods are used, although there is a predominance of qualitative approaches. Methods include literature review, case studies, documentary and policy analysis, interviewing, storytelling, secondary data analysis, post-occupancy evaluation and participant observation. The participants involved in the research included housing providers, service provider organisations, care workers, family and family caregivers, and older people.

The use of Kaupapa Māori methodologies is prominent in the Māori references. The use of indigenous research methodologies and the involvement of indigenous researchers are less apparent in the references relating to indigenous housing or living with dementia.

²⁴ Fleming and Bennett (2017); Pholeros et al. (2017); Ministry of Health (2016).

²⁵ Hoskins, R., Te Nana, H., Rhodes, P., Guy, P. and Sage, C. (2002). *Ki te Hau Kāinga: New Perspectives on Māori Housing Solutions*. A Design Guide Prepared for Housing New Zealand Corporation.

²⁶ Blosser, J., Corum, N., Glenn, D., Kunkel, J., and Rosenthal, E. (2014). *Best practices in Tribal Housing Case Studies 2013: A report by the Sustainable Native Communities Collaborative, An Initiative of Enterprise Community partners*. U.S. Department of Housing and Urban Development; Butler, A., Crane, E., Hogg, S., Maddison, T. and Smith, T. (2017). *Making a house a home: Indigenous engagement and housing design in BC*. Building Knowledge Summary Report, BC Housing Research Centre; Fineblitt, E. (2015) *Indigenizing Housing: A Guide to Providing Culturally-Appropriate Housing for Aboriginal Communities in British Columbia* West Vancouver: Aboriginal Housing Management Association; Hoskins et al. (2002); Rolleston, S. and S. Awatere (2009). Ngā hua papakāinga: Habitation design principles. *MAI Review* 2(2); Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019d) *He Kāinga Pai Rawa Atu Mō Ngā Kaumātua He Keteparaha Tēnei Mō Te Whare Kaumātua A Really Good Home for Our Kaumātua A Toolkit for Kaumātua Housing*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

4 Key Themes – Living with Dementia

The literature was examined for insights into the role of housing in supporting those living with dementia; not only the older person but also their whānau and family. Three broad themes about living with dementia were identified in the literature reviewed. Those themes were similar in both the Māori and indigenous literature:

- The importance of cultural factors in understanding living with dementia.
- Housing and the provision of care.
- Housing adequacy.

4.1 The Importance of Cultural Factors in Understanding Living with Dementia

International research on dementia and the home environment emphasises the fundamental importance of the home for people with dementia.²⁷ A sense of home confers wellbeing, security and a sense of identity. The challenge for dementia-friendly building design is to “... restore normalcy and, most importantly, maintain their identity” of both the individual and their carer.²⁸

The design of the home can support or inhibit cultural concerns and imperatives. If cultural factors are not incorporated into the living environment, this can affect the person with dementia’s enjoyment of their home, their ability to perform daily tasks, their ability to understand their home environment and to live safely in it.

Several references emphasise the important role of culture in ensuring acceptance, respect and appropriate care for those with dementia. The use of indigenous language in the home and in service provision is an important part of caring and therapy, as are traditional medicine and healing practices, cultural activities, contact with nature, and growing and preparing food.²⁹

With regard to Māori, Townsend notes that many Māori perceive dementia from a traditional cultural perspective, associated with spirituality as well as a holistic understanding of wellness.³⁰

²⁷ James and Saville-Smith (2019).

²⁸ Soilemezi, D. (2017). Living Well with Dementia at Home: Understanding the Role of the Home Environment. *Presidents Award for Research 2016*, 1-37, p.17.

²⁹ Jacklin and Warry (2012); Fineblitt (2015); Halseth, R. (2018). *Overcoming barriers to culturally safe and appropriate dementia care services and supports for Indigenous peoples in Canada: Emerging priorities*. National Collaborating Centre for Aboriginal Health; Pace (2013).

³⁰ Townsend (2011).

4.2 Housing and Care Provision

The reviewed literature focuses on two aspects of care provision: care and support provided by family, and the provision of formal care services. Those with dementia need to be able to access both formal and informal (family) support in order to be able to stay living in their homes.

The essential role of family caregivers in supporting their elder with dementia is explored in several references. There is evidence that beliefs around the role of family are a positive influence on the experience of dementia.³¹ Family involvement in care has multi-faceted benefits for both the older person and the caregiver. Those include cultural continuity and the passing on of knowledge from one generation to another. Doing daily tasks and helping their elder, for example with housework, shopping and personal care, also benefits the older person.³² The design of the home is critical for enabling family members to care for their elders, such as through the provision of space for family to stay, and respect for privacy and different spatial and activity needs of family members.

A dominant theme in the literature is the fundamental importance of housing, care and support working together in harmony. Both Māori and indigenous researchers note a prevailing lack of support for family and whānau caregivers, including a lack of information provided about dementia in ways that are appropriate for family.³³ Similarly, researchers observe the exclusion of cultural values and understandings from service provision, and conclude that this lack is detrimental to the wellbeing of elders, and could affect their ability to remain in their own homes.³⁴

The fundamental need to coordinate accommodation and care is highlighted in Māori feedback to the Ministry of Health's residential dementia care design guide. They commented that "...it is impossible to separate a built environment from a model of care".³⁵ This perspective is equally applicable to housing in the community. If there are barriers to people with dementia and their families accessing health and support services in their communities, then those barriers jeopardise their ability to stay in their homes as long as possible. Furthermore, it means that indigenous "shared caregiving" practices, where service providers support families to help in the care of their elders, are compromised.³⁶

³¹ Jacklin and Warry (2012).

³² Halseth (2018).

³³ Grant et al. (2016); Grant, E., Zillante, G., Srivastava, A., Tually, S. and Chong, A. (2017). *Lived experiences of housing and community infrastructure among Indigenous people with disability*. AHURI Final Report No. 283, Australian Housing and Urban Research Institute, Melbourne; Halseth (2018); Pace (2013); Smith, K., Flicker, L., Shadforth, G., Carroll, E., Ralph, N., Atkinson, D., Lindeman, M., Schaper, F., Lautenschlager, N. and D. LoGiudice (2011). 'Gotta be sit down and worked out together': Views of Aboriginal caregivers and service providers on ways to improve dementia care for Aboriginal Australians. *Rural and Remote Health*, 11(2); Townsend (2011).

³⁴ Dyllal (2014); Halseth (2018); Pace (2013); Smith et al. (2011); Townsend (2011).

³⁵ Ministry of Health (2016:8).

³⁶ Halseth (2018:17).

Some references note that, alongside the traditional expectation and practices of family involvement in caring for their elders, there are older people who do not have family willing or able to provide support.³⁷ Service providers must also meet the range of needs, including cultural needs, of those elders to enable them to remain in their homes as long as possible.

4.3 Housing Adequacy

Many older Māori and indigenous people face significant housing inadequacies, including unsafe and insecure housing, overcrowding, unaffordable housing and dwellings in disrepair.³⁸ Housing deficits are bad for all older people but particularly detrimental for those with dementia, as it affects their health, their safety, their ability to carry out daily activities, and the provision of care in the home. Inadequate housing can also put them at risk of homelessness.³⁹ Moreover, the pressure to move because of insecure housing can contribute to the deterioration of the person with dementia's ability to function.⁴⁰

Housing insecurity is a particular risk for older tenants, especially in New Zealand where the rental market is weakly regulated compared to international standards⁴¹ and is associated with poor house condition.⁴² Māori have lower rates of home ownership and higher rates of renting than all other ethnic groups, apart from Pacific peoples. Data from the 2013 census shows that 56.9 percent of Māori live in rental accommodation, compared to 36.3 percent of the total population. Māori aged 65 years and over have the second highest renting rate among older people, at 37.4 percent, compared to 18.8 percent of all those aged 65 and over.⁴³ Older tenants generally have lower incomes and fewer financial assets compared to their home-owning peers. They are also more likely to experience poorer health. Since older Māori experience high rates of renting, this means that they are particularly vulnerable to any negative impact of renting on their health and wellbeing.⁴⁴

³⁷ Pace (2013); Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019a). *Think Piece One: Te Moemoeā: The Dream*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

³⁸ Cram, F. (2016). *Older Māori: Downsizing experiences, outcomes and needs*. Report prepared as part of the Finding the Best Fit research programme. Auckland: Katoa Ltd.; Gabriel et al. (2014); Grant et al. (2016); Pace (2013); Reddy et al. (2019a); Smith et al. (2011).

³⁹ Gabriel et al. (2014); Grant et al. (2016); Walls, R. Millikan, L., Bridge, C. & L. Davy (2013). *Home Modification in Aboriginal Housing*. Home Modification Information Clearinghouse, University of New South Wales. Available from: www.homemods.info

⁴⁰ Grant et al. (2017).

⁴¹ Martin, C., Hulse, K. and Pawson, H. (2018). *The changing institutions of private rental housing: an international review* AHURI Final Report No. 292, Melbourne, Australia: Australian Housing and Urban Research Institute Limited.

⁴² White V., Jones M., Cowan V. and Chun S. (2017). *BRANZ 2015 House Condition Survey: Comparison of house condition by tenure*, Judgeford, New Zealand: BRANZ Ltd.

⁴³ Statistics New Zealand customised census data 2013 analysed by Dr. Natalie Jackson for the Life When Renting research programme, Ageing Well National Science Challenge.

⁴⁴ Pledger, M., McDonald, J., Dunn, P., Cumming, J., Saville-Smith, K. (2019) The health of older New Zealanders in relation to housing tenure: analysis of pooled data from three consecutive, annual New Zealand Health Surveys, *Australian and New Zealand Journal of Public Health*, 43(6).

5 Building Design Principles

The reviewed literature expressed six broad principles that pervade building design for both Māori and indigenous peoples. Those are:

- Culturally appropriate design.
- Connection of the built environment to land and place.
- A holistic approach to housing.
- Co-creation and community engagement.
- Community capability building.
- Sustainable housing.

5.1 Culturally Appropriate Design

An overarching theme is the “cultural design paradigm” where cultural aspects underpin design. This paradigm incorporates as fundamental to design, indigenous cultural values, concepts, principles and practices that have no equivalent in western cultures, but which have significant impacts on people’s ability to live well in the built environment.⁴⁵

Often indigenous cultural values and practices link the built environment with the natural world, and the wellbeing of residents with both. For example, it is notable that cultural practices around the use and protection of water are woven into building design through the incorporation of such aspects as rain water harvesting, design of wastewater systems, decorative water features, the siting of buildings near water and enabling access to water.⁴⁶

The application of a variety of those cultural aspects to building design is discussed in the literature, and set out in Infoboxes 2 and 3 below.

5.2 Connections to Land and Place

The literature emphasises the strong association of home with place. The dwelling does not only function as a shelter, but also embodies cultural, social, spiritual and environmental aspects that make it a home. In indigenous cultures, home is an integral part of the way people perceive and relate to the land.⁴⁷

For Māori, ‘home’ is described as “... about whānau, whenua and whakapapa”.⁴⁸ To take account of these fundamental ties, urban design and residential development should be “... about making connections with people, places and spaces.”⁴⁹ Furthermore, appropriate

⁴⁵ Memmott, P. (ed) (2003). *Take 2: Housing design in Indigenous Australia*, Royal Australian Institute of Architects, Red Hill: ACT.

⁴⁶ Blosser et al. (2014); Memmott (ed) (2003).

⁴⁷ Fineblitt (2015); Butler et al. (2017).

⁴⁸ Menzies (2018:4).

⁴⁹ Rolleston and Awatere (2009:1).

design that acknowledges place must encompass the full range of locations, from rural, to suburban, to urban, as well as different housing types and neighbourhoods.⁵⁰ These locations reflect the daily reality for many Māori who do not live on ancestral lands, although they still retain those connections.

Connections to ancestral and other places is complex for older Māori, as over their lives, other places can become equally if not more important to them. This is a particular issue for older Māori who have lived for many years away from their turangawaewae, and wish to continue to 'age in place' in locations where they have formed strong attachments over time. Moreover, some are unable to return to live on ancestral land and must make a home elsewhere.⁵¹

5.3 A Holistic Approach

Holistic approaches to housing design are broader than ensuring that the connections between physical shelter and the cultural, social, spiritual and environmental aspects of housing are reflected in the built environment. The literature emphasises that a holistic approach to housing design should deal with the whole build process, from conception to completion. This would include consideration of community development goals, community capability building, co-design with residents and partnership with community stakeholders.

For example, one analysis of 17 case studies of tribal housing projects in the USA found that a holistic approach (including meaningful consultation, partnerships and collaborations in project financing and employment) was essential to project success because it enabled complex problems encountered along the way to be solved.⁵²

5.4 Co-creation and Community Engagement

Community engagement is commonly practiced in Māori and indigenous housing projects. Engagement not only occurs in the design phase, but throughout the build process and beyond.⁵³ This approach emphasises the importance of consulting with the community so that design is informed by local knowledge and experience, and local needs are met.⁵⁴

Some references extend engagement to co-creation, through enabling local people to exercise control and decision-making. In this respect housing design and development must recognise the "... potential for people to control and manage their own process, and implement ... a framework in which this can happen successfully."⁵⁵ With regard to Māori,

⁵⁰ Hoskins et al. (2002).

⁵¹ Cram (2016); Reddy et al. (2019a); Williams (2012).

⁵² Blosser et al. (2014).

⁵³ Blosser et al. (2014); Butler et al. (2017).

⁵⁴ Grant et al. (2016).

⁵⁵ Barker in Memmott (ed) (2003:99).

Hoskins et al. advocate that “... it is essential that Māori housing solutions are conceived, planned and delivered with the Māori community”.⁵⁶

5.5 Capability Building

In keeping with a holistic approach, housing developments are often situated within a community development framework, contributing to overall community planning and development goals.⁵⁷ Research about indigenous housing projects has found that they often act as a catalyst for community development, education, training and community revitalisation.⁵⁸ Similarly, a holistic approach is fundamental to Māori housing design, which emphasises that housing is part of Māori development.⁵⁹

5.6 Sustainable Housing

There is a growing literature on indigenous sustainable building design, which shows the adoption of internationally tested sustainability standards and approaches in indigenous design, such as green building design and ‘smart growth’ planning strategies.⁶⁰

Sustainable design in indigenous housing developments covers not only the use of sustainable building materials, but also pays attention to efficient energy and water systems, and dwelling running costs. Often sustainable features are a practical response to living in remote locations where there are no reticulated utility services and few building providers. There is an emphasis on using design and materials that enable community members to do their own repairs and maintenance, or make changes to the building with minimal outside help.

5.7 Building Design Guidelines

Infobox 2 provides examples of how the principles outlined above are incorporated into Māori and indigenous building design guidelines.

Principle	Indigenous examples	Māori examples
Culturally appropriate design	Design to accommodate Aboriginal customary behaviours around privacy, avoidance, household structures, sleeping and eating, crowding and privacy and responses to death. ⁶¹	Open plan communal spaces; manuhiri zone and welcoming entrance; acknowledging tapu and noa aspects in design; indoor-outdoor flow; communal garden; provision for outdoor food

⁵⁶ Hoskins et al. (2002:4).

⁵⁷ Memmott (ed) (2003).

⁵⁸ Blosser et al. (2014); Fien et al. (2007); Memmott (ed) (2003).

⁵⁹ Hoskins et al. (2002); Rolleston and Awatere (2009).

⁶⁰ Blosser et al. (2014).

⁶¹ Grant et al. (2016).

	Design connects to “heritage, culture and nature”. ⁶²	preparation, cooking and dining. ⁶³ Māori urban design principles: whanaungatanga; kotahitanga, wairuatanga; mauritanga, orangatanga, manaakitanga, kaitiakitanga, rangatiratanga, mātauranga. ⁶⁴
Connection to land, landscape and place	The building expresses a relationship with the land. ⁶⁵ The built environment is designed to match the landscape. ⁶⁶	Various design solutions are tailored to place: urban/suburban whānau houses, urban/suburban papakainga, rural whānau houses, rural papakainga. ⁶⁷
Holistic approach	Use of “integrated design approach” incorporating community engagement, partnerships with local stakeholders and sustainable building. ⁶⁸	Māori urban design principles provide a holistic approach. ⁶⁹ Māori housing is designed as part of Māori development. ⁷⁰
Co-design and community empowerment	Establish project protocols with community. Consult on design options and revise as required. ⁷¹ Ensure that decisions made are acted on in the build. ⁷² Consultation is an ongoing process, begins early, builds respectful relationships, follows local protocols, practises flexibility and openness, follows through on commitments with actions. ⁷³	Use of community design workshops. ⁷⁴ Rangatiratanga – recognition of the right of Māori to determine and achieve individual and collective aspirations in urban design and planning. ⁷⁵
Capability building	Opportunities for local people in the build process. ⁷⁶	Use of local resources and skills. ⁷⁷
Sustainability	Safe, healthy, durable materials, efficient water use. ⁷⁸ Flexibility – the community can modify, repair and replace design	Siting of dwellings for sun, light, shelter from prevailing wind. Dwellings should include flexible design for residents’ changing

⁶² Blosser et al. (2014).

⁶³ Hoskins et al. (2002).

⁶⁴ Rolleston and Awaterere (2009).

⁶⁵ Fineblitt (2015).

⁶⁶ Walls et al. (2013).

⁶⁷ Hoskins et al. (2002).

⁶⁸ Blosser et al. (2014).

⁶⁹ Rolleston and Awaterere (2009).

⁷⁰ Hoskins et al. (2002).

⁷¹ Fien et al. (2007).

⁷² Memmott (ed) (2003).

⁷³ Fineblitt (2015).

⁷⁴ Hoskins et al. (2002).

⁷⁵ Rolleston and Awaterere (2009).

⁷⁶ Fien et al. (2007).

⁷⁷ Hoskins et al. (2002).

⁷⁸ Fineblitt (2015).

	<p>elements with minimal outside help. Longevity – housing is designed to be durable, sustainable and require minimal maintenance.⁷⁹</p> <p>Meet green building standards.⁸⁰</p> <p>Sustainability – building materials, alternative energy, siting and orientation of the dwelling, lifecycle costing.⁸¹</p>	<p>needs e.g., future extensions, additions, partitions. Provision for growing food. Use of energy efficient design and collection of grey water. Use of ecologically sustainable building materials.⁸²</p>
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Infobox 2: Building Design Guidelines

5.8 Building Design Principles for Older People

Several references mention building design features for older people, but only one reference is specifically concerned with design principles and guidelines for seniors’ housing: *He Kāinga Pai Rawa Atu Mō Ngā Kaumātua He Keteparaha Tēnei Mō Te Whare Kaumātua A Really Good Home for Our Kaumātua A Toolkit for Kaumātua Housing*.⁸³ The aim of this toolkit is to support the building of “safe, secure and appropriate Kaumātua communities”.

Some of the design principles for housing for older people are similar to those identified above in relation to Māori and indigenous building design:

- Cultural values, concepts and practices are expected to underpin the design.
- The connection to land, landscape and place.
- Holistic approach
- The importance of co-design, not only with older people expected to live in the housing, but also with their families and the wider community.
- Sustainable design.

Other design principles are specific to the needs of older people. These are:

- A sense of home and community.
- Enabling the older person to maintain connections with family and whānau.
- Ease of indoor and outdoor flow.
- Safety and security.
- Maintaining independence.
- Ensuring peace, quiet and privacy.
- Accessibility to meet physical and sensory needs.
- Carer safety.

⁷⁹ Butler et al. (2017).

⁸⁰ Blosser et al. (2014).

⁸¹ Fien et al. (2007).

⁸² Hoskins et al. (2002).

⁸³ Reddy et al (2019d).

- Accommodating the older person’s changing needs.
- Tenant support.
- Enabling the older person to maintain connections with the wider community.

Infobox 3 presents examples of how Māori and indigenous building design principles are incorporated into housing for older people.

Principle	Indigenous examples	Māori examples
Culturally appropriate design	Design to accommodate traditional lifestyle practices, food preparation, crafts; culturally resonant name of the housing complex; artwork; operating protocols. ⁸⁴ Use of space and screening to ensure required separations of individuals due to kinship requirements. ⁸⁵	A Māori worldview and Māori values frame the research underpinning the kaumātua housing toolkit, as well as the toolkit itself. Key Māori values associated with the project include kotahitanga (working together), kaitiakitanga (stewardship), tautokotanga (supportiveness) and manaakitanga (hospitality and care). ⁸⁶
Connection to land, landscape and place	Use of off-grid technology enabled elders to return to live on their ancestral land. ⁸⁷ Site and orientate dwellings to take account of views; match the built environment to the natural landscape. ⁸⁸ Windows allow a view of places of importance to elders. ⁸⁹	Symbolic importance of land, even if it is not ancestral land, because the land enables the vision. Erecting pou whenua as a cultural symbol. ⁹⁰
Holistic approach	Take account of the full range of needs of elders – spiritual, emotional, cultural, physical and mental wellbeing. ⁹¹	Building collaborative partnerships; with a wide range of people and organisations relevant to the project. ⁹²
Co-design	Inclusion of elder and youth perspectives. ⁹³ Involvement of elders in design, and learning from elders in the design process. ⁹⁴	Co-create a solution focused vision with kaumātua; co-create the housing project with kaumātua reflective of future residents. ⁹⁵

⁸⁴ Fineblitt (2015).

⁸⁵ Kirke in Memmott (ed) (2003).

⁸⁶ Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019b). *Think Piece Two: Kia Tūtuki te Moemoeā: The Road to Making the Dream/Vision a Reality*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

⁸⁷ Blosser et al. (2014).

⁸⁸ Walls et al. (2013).

⁸⁹ Fleming and Bennett (2017).

⁹⁰ Reddy et al. (2019b).

⁹¹ Smith et al. (2011).

⁹² Reddy et al. (2019d).

⁹³ Butler et al. (2017).

⁹⁴ Blosser et al. (2014).

Sustainable design	Consider climate and environmental conditions when installing home modifications with regard to impacts of climate and conditions on materials. ⁹⁶	Planning for sustainability: assemble a team with knowledge of sustainable practices, use quality materials. Balance a commitment to minimal environmental impacts, maximising outcomes for kaumātua, resources, timeframes and legal requirements. ⁹⁷
Sense of home and community	Small-scale building; scope for ordinary activities; space for personal belongings; the living environment provides opportunities for social connection. ⁹⁸	Consider compatibility of kaumātua residents at point of application. Support kaumātua to: nurture and maintain relationships with, and support, each other; foster belonging and ownership in the community. ⁹⁹
Connect with family and whānau	Housing provides opportunity to reunite extended families and to link young tribal members with elders and with cultural heritage. ¹⁰⁰	Consider including space for visiting whānau to stay. ¹⁰¹
Indoor and outdoor flow	Accommodate outdoor living and outdoor activities while addressing safety and security issues. ¹⁰²	Outdoor living spaces and space for communal gatherings; for kaumātua ensure easy access to outdoors with no steps. ¹⁰³
Safety and security	Siting of bathroom and toilet to allay safety and security concerns of elders. ¹⁰⁴ Locked cupboards/areas for storing assistive equipment to prevent it being used by others for which it is not designed and set up for, therefore may be unsafe for them. ¹⁰⁵	Safe, sufficient and economical heating system. ¹⁰⁶ Identify and manage risks around health and safety; ensure compliance with all health and safety legislation. ¹⁰⁷

⁹⁵ Reddy et al. (2019d).

⁹⁶ Walls et al. (2013).

⁹⁷ Reddy et al. (2019d).

⁹⁸ Pholeros et al. (2017).

⁹⁹ Reddy et al. (2019d).

¹⁰⁰ Blosser et al. (2014).

¹⁰¹ Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019c). *Think Piece Three: Te Ao Mārama: Kua ea te Moemoeā: Achieving the Dream/Vision*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

¹⁰² Walls et al. (2013).

¹⁰³ Hoskins et al. (2002).

¹⁰⁴ Fantin in Memmott, (ed) (2003).

¹⁰⁵ Walls et al. (2013).

¹⁰⁶ Hoskins et al. (2002).

¹⁰⁷ Reddy et al. (2019d).

Maintaining independence	A homelike environment that allows residents to be independent and make choices. ¹⁰⁸	Kaumātua mana motuhake - kaumātua independence and autonomy of self and collective determination. ¹⁰⁹ Provide wrap-around services to support kaumātua to maintain self-determination and independence in everyday life. ¹¹⁰
Peace, quiet and privacy	Provide elders with their own private spaces. Ensure adequate sound insulation and siting of bedrooms away from potentially noisy spaces. ¹¹¹	Quiet semi-detached accommodation. ¹¹²
Accessibility	Residents can move around easily and safely, indoors and outside. There is visual access and clear wayfinding. ¹¹³ Use fully accessible design for elder housing. ¹¹⁴	Ensure easy access to outdoors with no steps. Bathroom: wet area shower and grab-rails. ¹¹⁵ Housing design adopts principles and meets standards of age friendliness in external grounds, access, design and garaging etc. Consider accessibility needs both inside and outside, in the garden. Ensure communications are in an accessible format. ¹¹⁶
Carer safety	Install home modifications and equipment to provide carers with a safe environment. ¹¹⁷	
Changing needs	The health needs and functionality of people with dementia change as the disease progresses and they may need home modifications to support their changing skill set. ¹¹⁸	Identify emerging and future needs to support ageing in place. Monitor the changing needs of residents. ¹¹⁹

¹⁰⁸ Pholeros et al. (2017).

¹⁰⁹ Reddy et al. (2019c);

¹¹⁰ Reddy et al. (2019d).

¹¹¹ Fien et al. (2007).

¹¹² Hoskins et al. (2002).

¹¹³ Pholeros et al. (2017).

¹¹⁴ Blosser et al. (2014).

¹¹⁵ Hoskins et al. (2002).

¹¹⁶ Reddy et al. (2019d).

¹¹⁷ Walls et al. (2013).

¹¹⁸ Walls et al. (2013).

¹¹⁹ Reddy et al. (2019d).

Tenant support	Staff training, tenant support systems and services. ¹²⁰ Education of residents on household technologies. ¹²¹	Kaumātua-centred tenancy relationships: housing security; tenant committee; tenant participation in decision-making relating to management and control of their homes. ¹²²
Connection with the wider community	Be good neighbours, welcome the community into the new building, establish local partnerships. ¹²³ Enable residents to connect with the wider community. ¹²⁴	Establish and maintain partnerships for the provision of wrap-around services. Ensure health and social services provide care and support. ¹²⁵

Infobox 3: Building Design Specifically Relating to Older People

¹²⁰ Fineblitt (2015).

¹²¹ Fien et al. (2007).

¹²² Pholeros et al. (2017).

¹²³ Fineblitt (2015).

¹²⁴ Pholeros et al. (2017).

¹²⁵ Reddy et al. (2019d).

6 Dementia-friendly Building Design

Two indigenous dementia-friendly design guidelines were found, both of which are designed for residential dementia care in indigenous Australian communities:

- Pholeros, P., Bennett, K., Welke, A. and Arch, M. (2017). *Indigenous aged care design guide: Environmental Design Resource* Resource 6. Dementia Training Australia.
- Fleming, R. and Bennett, K. (2017). *Applying the Key Design Principles in Environments for People with Dementia* Resource 2 Environmental Design Resources, Dementia Training Australia.

The Australian dementia-friendly design guides draw on the key principles of the National Indigenous Housing Guide and the Indigenous Environmental Assessment Tool, as well as internationally tested dementia-friendly building design principles. Those principles have also been applied to home modifications for Aboriginal elders.¹²⁶

With regard to internationally tested dementia-friendly design principles, it should be noted that those general design principles are not generated from indigenous worldviews and they have not been widely tested in different cultural and indigenous communities, although the two Australian dementia-friendly design guides have tested the principles in Aboriginal communities. It should also be noted that evidence underpinning the development of principles is largely based on residential care settings and requirements, not on the needs of people with dementia living in their own homes.¹²⁷

The dementia-friendly design principles applied in residential care for Aboriginal communities are presented in Infobox 4. Pholeros et al. provide detailed examples of how to apply those principles, setting out for each building design aspect, what must be done, what must be avoided, and what could be considered in the build.

Design principles	Description	Examples of building design
Unobtrusively reducing risk	A safe and healthy environment helps residents to use their abilities to the full and do activities that are useful and meaningful to them	Control of access to entrances/exits Safety around fire Safety in the kitchen Hot water temperature Lighting and avoiding glare
Focusing on the small scale	Helps residents to have a sense of place and wellbeing	Optimum number of residents in the facility Inside and outside appearance, scale and detailing
Seeing and being seen	Enable visual access and wayfinding so that residents can easily move around, understand and interpret their environment	Seeing the way to different rooms Seeing the exit Seeing outside features from inside the building

¹²⁶ Walls et al. (2013).

¹²⁷ James and Saville-Smith (2019).

Hiding unimportant things	Reduce the impacts of unnecessary visual and auditory stimulation	Preventing access to storage areas where equipment and dangerous products are stored
Emphasising important things	Highlighting places and functions that are meaningful for residents	Recognising different rooms and functional areas Task lighting
Moving about and engaging	Enabling residents to move around easily and safely so they can enjoy doing things they like	Path width and surface Level access Width of doorways Size of rooms Circulation space
Creating a recognisable and meaningful place	A familiar setting to help residents feel in control and able to function effectively	Colours Furniture Decorations
Choosing to be on your own or with others	The living environment provides different opportunities for social interaction	Places to sit indoors and outdoors Activity spaces to accommodate different sized groups
Being part of the community	Enabling residents to connect with the wider community	Dining with family
Doing what you want to do	A homelike environment that allows residents to be independent and make choices	Kitchen and laundry areas for residents Space for activities Residents can control heating, lighting, ventilation

Infobox 4: Dementia-friendly residential care design principles for Aboriginal communities

Fleming and Bennett show how general dementia-friendly design guidance and assessment tools can be applied and adapted to ensure cultural aspects are integrated into building design. They conducted a case study of planning a culturally appropriate long-term and respite care facility for indigenous elders, called Tjilpiku Pampaku Ngura (a home for older men and women). The design guidance and tools were used and assessed in the design and planning phase of the facility. Their research showed how the guidance and tools could be adapted to prioritise cultural aspects in design. For example:

- Even though the guide suggested that perimeter fencing should blend in with the surrounding environment, the facility has erected fencing that is easy to see and is an obvious barrier. This was a deliberate design decision because the fence identifies the facility as a place for elders where they can be at peace and secure, and prevents people coming on to the property uninvited.
- The size and placement of buildings mirrors the size and configuration of traditional Aboriginal buildings and shelters.
- Windows are designed to allow a clear view of places of interest and importance to residents.
- A large painting in traditional design provides a visual cue to help residents find their way to the lounge room.
- Local people considered the selection of the site and its cultural and spiritual significance as much more important than the design of the facility itself. As a consequence, there

was extensive consultation about site selection, and it took three years to find the right site.

The only New Zealand guidelines for dementia-friendly building design that include reference to design for Māori are the Ministry of Health's guidelines for secure dementia residential care. This information is contained in a short section that also includes commentary on bicultural aspects of facility design. Design points are related to building a residential facility and include:

- Consideration of the resident's history, life experiences, beliefs and values, activities and behaviours.
- Respect for the individual and their needs.
- Consideration of the marae as the basis for design.
- Ensure there is space for whānau, separate from the older Māori person's space.
- Enable whānau to provide care and support to their elder within the facility.
- Provide flexible space so that it may be used for different purposes.
- Use carvings and other important cultural aspects to enhance the environment.
- Incorporate food gardens and native plantings into the facility.
- Provide space for traditional healing practices and karakia.
- Include a water feature.
- Bless new buildings.

It may be appropriate to use those design features in housing in Māori communities, however no research has been done on the potential for translating design from residential care settings to housing for people living in their communities.¹²⁸

6.1 Efficacy of Building Solutions

The general review considered the efficacy of a range of solutions concerning building entry/exit, self-navigation and spatial orientation, enhancing independence and performing daily tasks, managing behavioural issues and ensuring safety.¹²⁹ That review found there is good-to-strong evidence for the efficacy of some specific dementia-friendly building design solutions, but evidence about other solutions is inconclusive or contradictory.

There is good evidence that appropriate lighting levels support way-finding, orientation and the performance of tasks. There is strong evidence that people with dementia are less aggressive when sensory stimuli such as light, temperature and noise are controlled. There is also strong evidence that minor home adaptations are cost-effective for preventing falls and injuries, improving performance of daily activities and improving mental health. In contrast, there is some evidence of contradictions between design for sight loss, and design for controlling challenging behaviour. Designing for safety and for accessibility can also conflict with dementia-friendly design.

¹²⁸ James and Saville-Smith (2019).

¹²⁹ James and Saville-Smith (2019).

The general review found a lack of knowledge about and assessment of building design solutions from a cultural perspective. The next section considers those knowledge gaps.

7 Research Opportunities for the Development of Dementia-friendly Housing for Māori

Internationally, there is a lack of research about the housing needs of indigenous people living with dementia, and few evidence-based design guides grounded in a cultural worldview. Similarly, there is a lack of research focused on the housing needs and appropriate building design for Māori living with dementia. Despite those gaps, there is a body of New Zealand and international research and design guidelines for culturally-appropriate age- and disability-friendly housing, which can inform dementia-friendly housing design in New Zealand.

The research reviewed considers that greater understanding of the housing and support needs for indigenous people with dementia is required, and that research must be conducted within an indigenous research framework.¹³⁰ In New Zealand there is a need for kaupapa Māori research specifically about building design solutions for Māori with dementia and their whānau, in order to provide sound information and analysis to inform the provision of appropriate housing.

The development of dementia-friendly homes for Māori must be considered within a broad framework that situates homes within communities and connects people with places and their culture. It must also situate building design within an understanding of Māori community development aspirations. A narrow focus on specific building design features such as floorplan, materials, fixtures and fittings, is inadequate.

There is a rich platform of Māori and indigenous research that situates housing within a cultural worldview. This is the launch pad for developing dementia-friendly housing design. The literature on Māori architecture and design sets out concepts and issues specific to Māori that are poorly addressed in mainstream housing developments, but which are essential to understanding how houses should function well for older Māori and their whānau.

There is also a growing literature on ageing in Māori communities, and the cultural, social and economic factors affecting the wellbeing of older Māori. This literature provides important insights into the lived experiences of older Māori, including their housing needs, and how housing connects to wellbeing. Finally, there are well-established kaupapa Māori health and wellbeing frameworks used in the provision and assessment of health services, which could be applied in housing design appropriate for Māori living with dementia. Those include Whānau Ora,¹³¹ Whare Tapa Wha¹³² and kaupapa hauora Māori.¹³³

¹³⁰ Gabriel et al. (2014); Halseth (2018).

¹³¹ Dyll (2014).

¹³² Townsend (2011).

By using evidence-based knowledge such as international indigenous literature on culturally appropriate housing, Māori building design principles and guidelines, kaupapa Māori health and wellbeing concepts and kaupapa Māori research methodologies, practical solutions for housing for Māori with dementia and their whānau could be developed.

The literature reviewed made a number of suggestions for further research relevant to the development of dementia-friendly housing. In addition, many of the suggestions for further research made in the general review are relevant to Māori living with dementia.

In summary, there is a need for research about:

- The physical condition, functionality, affordability, security and adequacy of dwellings in which older Māori live, the extent to which their housing is able to support their independence and wellbeing, and what needs to be done to make housing more functional.
- Understanding how the persons' physical, social and cultural environments interact, and how cultural preferences and requirements connect with dementia-related needs.
- The housing design preferences of Māori with dementia.
- How housing can be designed to support in-home care and the ability of whānau to share in the provision of care.
- Applying what can be learned from Māori perspectives about ageing and enhancing the quality of life of kaumātua, to the development of appropriate housing for those living with dementia.
- The potential to include dementia-friendly design across the different housing types and urban design configurations preferred by Māori, such as those identified by Hoskins et al.
- Older Māori are more likely than non-Māori to live in rentals. Consequently, there is a need for research that investigates the access of older Māori with dementia living in rentals to design features that support their independence and wellbeing.

¹³³ Wenn, J. (2007). *Kaupapa Hauora Māori: Ngā Whakaaro Whakahirahira o Ngā Kaumātua*. (PhD Thesis) Te Pumanawa Hauora, Research Centre for Māori Health and Development, Massey University, Wellington, New Zealand.

APPENDIX 1:

Search Parameters and Terms Used for the General Literature Review

Search parameters	Search terms
<p>Research covering both new builds and existing stock is included.</p> <p>The stock is lived in by people living independently (including the use of in-home help and/or living with others).</p> <p>Dwellings can be held in any tenure.</p> <p>Solutions must focus on the dwelling's ability to support and enhance the individual's functionality, safety and independence.</p> <p>Solutions may address social and technical barriers.</p> <p>There is a focus on value-for-money solutions.</p> <p>There is a focus on selected building components and interior design that address:</p> <ul style="list-style-type: none">• Entrance and exit solutions.• Self-navigation.• Individual function, day-to-day self-management and independence.• Enjoyment and ambience of the home.• Mitigation of behavioural issues that might lead to institutionalisation.	<p>dementia</p> <p>Alzheimer's</p> <p>cognitive impairment</p> <p>housing</p> <p>housing design</p> <p>dementia friendly design</p> <p>community care</p> <p>home care</p> <p>ageing in place</p> <p>small scale housing</p> <p>extra care housing</p> <p>sheltered housing</p> <p>assisted living</p> <p>self navigation</p> <p>way finding</p> <p>self management</p> <p>behaviour management</p>

APPENDIX 2:

Annotated Bibliography: Dementia-Friendly Building Design Solutions

Māori literature

Cram, F. (2016). *Older Māori: Downsizing experiences, outcomes and needs*. Report prepared as part of the Finding the Best Fit research programme. Auckland: Katoa Ltd.

A kaupapa Māori research case study of Māori housing experiences with a focus on the material, cultural, personal and locational factors affecting decisions older Māori make about housing downsizing. The research was conducted in Hawkes Bay and Christchurch with both owner-occupiers and renters in a variety of housing situations. Whānau matters and health issues largely informed their housing decisions. Some participants' housing choices were limited and driven by health conditions or due to lack of whānau support. Moving to smaller accommodation had been freeing for some, but others experienced dislocation and the challenges of finding a 'compatible community'.

Dyall, L. (2014). Dementia: Continuation of health and ethnic inequalities in New Zealand. *New Zealand Medical Journal*, 127(1389): 68-81.

While dementia is commonly associated with ageing, Dyall argues that colonisation histories, socio-economic determinants of health, health and social inequalities across the life course and social marginalisation are also key factors impacting on Māori and Pacific peoples. Dyall proposes that the Whānau Ora model is used to inform the development of policy and services to support Māori with dementia and their whānau.

Hoskins, R., Te Nana, H., Rhodes, P., Guy, P. and Sage, C. (2002). *Ki te Hau Kāinga: New Perspectives on Māori Housing Solutions*. A Design Guide Prepared for Housing New Zealand Corporation.

This practical design guide based on Māori design principles covers urban, suburban and rural housing including stand-alone housing, papakāinga, master planning and re-developing housing stock to suit changing whānau needs. The guide includes concept plans and practical design guidance for different zones inside and outside of the dwelling, including living/whānau room, bedrooms, whare paku, laundry, outdoor kitchen and dining and food gardens. Advice is given on design considerations for different age groups and for energy-efficient features.

Ministry of Health (2016) *Secure Dementia Care Home Design* Wellington: Ministry of Health.

An information resource for the development of secure aged residential care for people with dementia, this guide includes a short section of cultural identity and Māori and bicultural aspects. Most of the guide concerns dementia residential care design principles, which are based on international design principles.

Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019a). *Think Piece One: Te Moemoeā: The Dream*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

This is the first of three ‘think pieces’ that chart the development of a kaumātua village, from design and planning to implementation and the lived experiences of kaumātua living in the village. All think pieces are based on kaupapa Māori research approaches. Think Piece One focuses on the vision and the first ideas, and the insights gained for the development of kaumātua housing. At this stage a new model of working and a new model of urban community housing for kaumātua emerged.

Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019b). *Think Piece Two: Kia Tūtuki te Moemoeā: The Road to Making the Dream/Vision a Reality*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

Think Piece Two focuses on what can be learned about values, decisions and processes that enabled the dream of kaumātua housing to become a reality. Key values are discussed. Some informed and underpinned the development process while others facilitated ‘getting things done’.

Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019c). *Think Piece Three: Te Ao Mārama: Kua ea te Moemoeā: Achieving the Dream/Vision*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

Think Piece Three considers the overall learning from the development of kaumātua housing. It focuses on the lived experience of those in the village, and the reflections of kaimahi and whānau.

Reddy, R., Simpson, M., Wilson, Y., Nock, S., and Johnston, K. (2019d) *He Kāinga Pai Rawa Atu Mō Ngā Kaumātua He Keteparaha Tēnei Mō Te Whare Kaumātua A Really Good Home for Our Kaumātua A Toolkit for Kaumātua Housing*. Wellington: Building Better Homes Towns and Cities National Science Challenge (BBHTC NSC).

This toolkit for the development of kaumātua housing includes guiding whakatauki (proverbs), value statements, checklists, tips, templates, examples and information sources. The toolkit is based on research detailed in the three think pieces described above. The toolkit is organised around eight stages covering: creating the vision; building collaborative relationships and partnerships; leading the project; understanding funding and finance; co-creating fit-for purpose design; building kaumātua-centred tenancy relationships; providing wrap-around services; caring for your asset.

Rolleston, S. and S. Awatere (2009). Ngā hua papakāinga: Habitation design principles. *MAI Review* 2(2).

This paper focuses on planning and developing papakāinga in urban environments. An Auckland case study and a literature review are used to identify nine key principles for Māori sustainable development. These principles incorporate Māori concepts, values and design principles. The principles are described and it is shown how they can be applied to ensure good urban design and development. The principles are: whanaungatanga; kotahitanga, wairuatanga; mauritanga, orangatanga, manaakitanga, kaitiakitanga, rangatiratanga, mātauranga.

Townsend, M. (2011). *Māori and dementia: Māori health professionals' perceptions of dementia, help offered and suggested improvements*. (Master's Thesis) University of Waikato, New Zealand.

This thesis investigates the perceptions of Māori health professionals about Māori elders and dementia, traditional and contemporary understandings of dementia and how that affects experience. Townsend looks at challenges facing whānau caregivers, and increasing reliance on aged residential care in the Māori community. Service provision was found to lack cultural values and to be disjointed.

Williams, C. (2012). *Positive ageing in place: Older Māori in traditional and non-traditional place*. (Master's Thesis) University of Waikato, New Zealand.

This thesis examines the role of place in the experiences of ageing for older Māori, and the extent to which the choice of place facilitates a sense of ageing positively. The research focuses on Māori concepts of place, ancestral connection, the experience and meaning of home, the dynamics of whānau support and access to services. The thesis concludes that positive ageing is facilitated where older Māori can live in their places of choice, have firm attachments, a sense of community and can maintain control over their affairs.

Indigenous literature

Blosser, J., Corum, N., Glenn, D., Kunkel, J., and Rosenthal, E. (2014). *Best practices in Tribal Housing Case Studies 2013: A report by the Sustainable Native Communities Collaborative, An Initiative of Enterprise Community partners*. U.S. Department of Housing and Urban Development.

This report presents 17 native American housing projects using sustainable construction and incorporating strong cultural and historical design. The developments span urban and rural locations, and include different tenures. Factors relating to success, best practices, risks and challenges are discussed. There is a strong emphasis on multi-generational housing, although eight projects include housing for elders. One of those is a housing development specifically for elders. Another project has a group of dwellings especially for elders or disabled with fully accessible design. Learnings specific to housing for elders are identified including: the involvement of elders in design, linking generations through housing, bringing elders back to their ancestral land, and the importance of private space for elders.

Butler, A., Crane, E., Hogg, S., Maddison, T. and Smith, T. (2017). *Making a house a home: Indigenous engagement and housing design in BC*. Building Knowledge Summary Report, BC Housing Research Centre.

This Canadian report includes three case studies of urban and rural housing developments. Best practices and principles for working with indigenous communities on housing projects are discussed. Core principles for housing design are: diversity – design meets the diverse and unique needs of indigenous communities and individuals; flexibility – the community can modify, repair and replace design elements with minimal outside help; longevity – housing is designed to be durable, sustainable and require minimal maintenance; and wellbeing – design considers emotional, spiritual and social impacts as well as physical and structural needs.

Fien, J., Charleworth, E., Lee, G., Morris, D., Vaker, D. and Grice, T. (2007). *Flexible guidelines for the design of remote Indigenous community housing*. AHURI Positioning Paper No. 98. Melbourne: Australian Housing and Urban Research Institute.

This report presents concepts and design principles that build on the focus on safety, health, quality control and sustainability in Australia's *National Indigenous Housing Guide*, and related State and Territory guidelines. The cultural design approach, environmental health approach and housing as process philosophy are explained. Some specific design features for elders are discussed, including: the importance of private spaces, the need for noise control and accessible design.

Fleming, R. and Bennett, K. (2017) *Applying the Key Design Principles in Environments for People with Dementia* Resource 2 Environmental Design Resources, Dementia Training Australia.

This report applies design principles and assesses the physical environment design guide in five case studies of dementia residential care facilities. Step-by-step guidance on the use of the physical environment assessment tool is provided. The report includes a case study using the tool in the design and planning phase of a respite and long term care facility for Aboriginal elders with dementia to see whether the design can be applied for indigenous elders. The report concluded that it is important to use a principles-based approach rather than a checklist.

Fineblitt, E. (2015) *Indigenizing Housing: A Guide to Providing Culturally-Appropriate Housing for Aboriginal Communities in British Columbia* West Vancouver: Aboriginal Housing Management Association.

This guide provides ideas for consideration when planning, designing, and operating social housing for Aboriginal tenants in Canada. Guidelines expand on key aspects of: consultation, location, tenancy management and tenant relationships, accommodating cultural lifestyles and practices, architecture and design, neighbourhood and building a sense of community, sustainable construction and developing the capability of construction personnel, operational staff and tenants. There is one case study of assisted living housing for elders and people with disabilities.

Gabriel, M., Stirling, C., Faulkner, D. and Lloyd, B. (2014). *Future housing and support needs of people with dementia*. AHURI Positioning Paper No.159. Melbourne: Australian Housing and Urban Research Institute.

This literature review considers the housing and support needs of people with dementia, in order to develop a better understanding of the role housing plays in supporting those with dementia. The review concludes that poor quality housing and poor living conditions exacerbate problems for indigenous people with dementia living in remote areas. Furthermore, the management of dementia at home is complicated by problems of social and economic disadvantage and access to appropriate housing.

Grant, E., Zillante, G., Srivastava, A., Tually, S. and Chong, A. (2017). *Lived experiences of housing and community infrastructure among Indigenous people with disability*. AHURI Final Report No. 283, Australian Housing and Urban Research Institute, Melbourne.

This report explores the interconnections between housing, community infrastructure and quality of life for indigenous people living with disability in remote, rural and urban areas. The report found that those with cognitive and/or psychosocial disability experience the most difficulty accessing safe and appropriate housing. There is a particular lack of housing design to meet the needs of those with visual impairments and cognitive disabilities.

Grant, E., Zillante, G., Tually, S., Chong, A., Srivastava, A., Lester, L., Beilby, J. and Beer, A. (2016). *Housing and Indigenous people living with a disability: lived experiences of housing and community infrastructure*. AHURI Positioning Paper No.168, Melbourne: Australian Housing and Urban Research Institute Limited.

This literature review investigates the relationship between housing, community infrastructure and quality of life for indigenous people living with disabilities. Main findings are that indigenous Australians living with disabilities face multiple barriers in accessing adequate housing and supports. Under-reporting and non-reporting of disability among the indigenous population is identified. The report notes that few studies have been conducted examining 'best-practice' housing for indigenous people living with a disability. The authors advocate a design framework emphasising community ownership, community engagement, community participation and community empowerment.

Halseth, R. (2018). *Overcoming barriers to culturally safe and appropriate dementia care services and supports for Indigenous peoples in Canada: Emerging priorities*. National Collaborating Centre for Aboriginal Health.

This literature review identifies the challenges and barriers indigenous people in Canada face in accessing culturally safe and appropriate dementia care services and supports, and suggests ways of overcoming them. It considers the importance of cultural aspects in care, and the role of family in providing care alongside formal care providers. The review identifies a critical need for investment in housing and care services in order to support elders to remain in their homes as long as possible.

Jacklin, K. and Warry, W. (2012) Forgetting and Forgotten: Dementia in Aboriginal Seniors *Anthropology and Aging Quarterly* 33(1):13.

This conference paper on Alzheimers and related diseases in Aboriginal communities in Canada argues that the needs of people with dementia are overlooked by service providers. Jacklin and Warry consider cultural understandings of dementia, the important role of culture in supporting those with dementia, and the struggle between biomedical and traditional approaches to ageing and health.

Memmott, P. (ed) (2003). *Take 2: Housing design in Indigenous Australia*, Royal Australian Institute of Architects, Red Hill: ACT.

This collection of papers including both indigenous and non-indigenous practitioners and researchers presents information about the design of housing for Aboriginal Australians. It discusses three influential design paradigms used in designing housing that involve both complementary and contradictory elements: cultural design paradigm, environmental health paradigm and housing-as-process philosophy. Examples of different housing projects across Australia are included, from remote areas to suburban Sydney.

Pace, J. (2013). *Meanings of memory: Understanding aging and dementia in First Nations communities on Manitoulin Island, Toronto*. (Doctoral Dissertation) McMaster University, Hamilton, Ontario.

This thesis considers successful ageing and dementia, practices relating to caregiving and issues around the provision of services. Changes to culture and traditional ways of life have impacted on the ability to age successfully and on the way in which dementia is perceived. A need for improved culturally responsive services and supports is identified.

Pholeros, P., Bennett, K., Welke, A. and Arch, M. (2017). *Indigenous aged care design guide: Environmental Design Resources, R6*. Dementia Training Australia.

Developed in collaboration with Dementia Training Australia the *Indigenous Aged Care Design Guide* builds on the National Indigenous Housing Guide to identify key principles for design, construction, assessment and maintenance of care facilities for older Aboriginal and Torres Strait Islander people. Factors such as scale, stimuli, visual access, safety, familiarity, and domesticity are considered in relation to enhancing independence, self-esteem, confidence, and a sense of personal identity, maintaining relationships and connections and compensating for disability. The authors place particular importance on the significance of the external and internal environment, its significance to Aboriginal and Torres Strait Islanders and the ways in which they understand, interpret and interact with it.

Smith, K., Flicker, L., Shadforth, G., Carroll, E., Ralph, N., Atkinson, D., Lindeman, M., Schaper, F., Lautenschlager, N. and D. LoGiudice (2011). 'Gotta be sit down and worked out together': Views of Aboriginal caregivers and service providers on ways to improve dementia care for Aboriginal Australians. *Rural and Remote Health*, 11(2).

This paper considers ways to overcome factors affecting the successful delivery of services to Aboriginal people with dementia living in remote communities, and to their families and communities. It comments on the impacts of overcrowding and lack of accessible housing on the health and wellbeing of older people.

Walls, R. Millikan, L., Bridge, C. & L. Davy (2013). *Home Modification in Aboriginal Housing*. Home Modification Information Clearinghouse, University of New South Wales. Available from: www.homemods.info

This report looks at the impacts of an undersupply of appropriate and accessible housing in remote Aboriginal communities. It contains a checklist of key issues and design elements for effective home environments for disabled Aboriginals. While not focused on those with dementia, this report includes consideration of dementia design needs.

APPENDIX 3:

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