

# Retrofitting, a Response to Lack of Diversity: An Analysis of the Home Modification and Maintenance Services Funded under the Home and Community Care Program

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## **Abstract**

*The practice of retrofitting existing homes is increasing. According to the Australian Bureau of Statistics (ABS), Australians spent \$14,321 million on renovating residential dwellings in the year to June 2001. The Home and Community Care Program (HACC) is a collaborative program between the Commonwealth and State Governments that funds housing assistance to make homes more suitable for frail older people and people with disabilities. To date limited analysis has been undertaken on HACC client housing assistance data. Thus, there is inadequate knowledge on the prevalence of HACC funded housing assistance in Australian states and the reasons for differences.*

*This paper outlines preliminary findings of secondary analysis of HACC client data for the 2001/2002 reporting period, and selected comparisons with ABS data. Crosstabulations that included home modification, client age and client area of residence were conducted. This study funded by the New South Wales Department of Ageing Disability and Home Care, indicated that 3% of all HACC clients received a home modification service. New South Wales had the most number of home modifications (56%, n= 10974), while Victoria had the fewest (< 0.1%, n=18) home modifications despite having the second highest number of residents with a disability in Australia. This highlights regional differences in policy and funding structures that influence HACC housing assistance availability to consumers.*

*This paper highlights the major differences in HACC funded home modification trends between Australian states, client age groups, client's indigenous status and explore*

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*possible explanations for variations. It also provides some feedback from selected New South Wales state departments concerning the relevance of these findings to historical, current and planned policy implementation.*

## **1. Introduction**

Traditional Australian housing has been largely that of the ‘great Australian dream’ comprising 2-4 bedrooms and a bathroom on a quarter acre block in the suburbs (see, McKay, 1986). While design and construction has changed and will continue to change over time, neither our traditional nor current building practices are sufficiently inclusive or diverse to adequately accommodate older and disabled people without significant and costly retrofitting. The assumptions underpinning the majority of residential housing designs assumes average adult dimensions and reach ranges based on full health and physical fitness (see, Imrie and Wells, 1993; Imrie, 1996; Scotch and Schriener, 1997). As a consequence, inaccessibility in the form of stairs, narrow entry/exit, corridors, bathroom problems etc. render remaining in the community without substantial and costly retrofitting problematic (see, Buckle, 1971; Iwarsson and Isacsson, 1993; Stark, 2001).

*Retrofit* can be defined as “to fit in or on to an existing structure, such as an older house” (see, Word Net, 2003). However, a number of other terms are often used synonymously such as *modification*, *adaptation*, *renovation* or *remodelling*. While each term may be said to have nuances of semantic difference, all refer to change to an existing housing structure. For instance, the terms *modification* or *adaptation* are the words most commonly used to refer to changes made to a home in order to accommodate a particular set of human abilities, while the terms *renovation* and *remodelling* are more lifestyle or activity driven (for example, adding on a rumpus room for growing children). In this paper the term *home modification* is used for retrofitting events specifically aimed at making homes more suitable for people with activity restrictions caused by frailty or disabilities. Usage of the term *modification* implicitly de-emphasises fashion, aesthetic or stylistic concerns that are inherent in the notion of *remodelling*. *Home modifications* can range from simple additions such as the installation of grabrails or adjustable showers, to major construction such as the installation of ramps or the lowering of benches to make the housing stock more accessible to those with impaired abilities. Further many argue, that disability impacts all people either temporarily or permanently, because it is a part of life and is inevitable if you live long enough (see, Jones, et. al., 1998; Hasselkus, 2002).

### ***Increasing population diversity requires an inclusive housing response***

The growing retrofit trend can be attributed to a combination of factors such as changing population demographics, government policy and public attitude. The Australian population is ageing, and given various demographic factors, this trend is likely to continue. Ageing correlates with impairments in ability, to the extent that at least one long-term condition was reported for almost all (99%) people aged 75 years and over (see, Australian Bureau of Statistics, 2002a). Recent projections indicate that by 2031, the population of people aged 65 years and over will reach 22% of the total population (see, Australian

Bureau of Statistics, 2002b). The rate of disability not associated with ageing is also increasing as a result of improved neonatal and in-vitro technologies and the increased incidences of older mothers. In 2003, 20 % of Australians reported a disability (see, Australian Bureau of Statistics, 2005).

Governmental policies (such as those that promote ‘ageing in place’, ‘care in the community’ and a move away from institutionalisation) coupled with the public attitude that favours these policies and the changing population trends in Australia, have lead to a larger number of frail older people and people with a disability living at home in the community instead of in cared accommodation. In 2003, 93% of people with disabilities lived in households that were not cared accommodation, and 91% of people over 60 lived in private accommodation (see, Australian Bureau of Statistics, 2005).

People with a disability, regardless of whether or not it is age related, often face difficulties in managing activities of daily living. For instance, in 2003, 15.2% of Australians were limited in one or more of the core activities of self care, mobility and communication (see, Australian Bureau of Statistics, 2005). Home modifications can facilitate these activities and enable frail people and people with a disability to either function independently or reduce the amount of assistance required. Apart from frail older people and people with disabilities, modifications to homes also aid people who care for frail people or people with disabilities and makes the home a safer place for all (see, Axtell and Yasuda, 1993; Trickey, et. al., 1993; Cantu, 2003).

Clearly home modifications can have a major impact on a person’s quality of life. Given the current lack of diversity in traditional Australian housing, and the increasingly diverse demands of Australia’s current and future populations, it is likely that the current retrofit trend will not only continue but also increase its pace.

### ***Home and Community Care Program***

The Home and Community Care (HACC) Program provides home modification services in Australia. It is jointly funded by the Commonwealth and the State and Territory Governments to assist frail older people, people with disabilities and their carers by providing assistance to those living at home or in the community (see, Department of Health and Ageing, 1998). It is a cost-shared program where the Australian Government provides 60% of the funds, while the States/Territories provide the remaining 40% (see, Home and Community Care, 2002).

### ***Objectives of the secondary data analysis undertaken for this paper***

This paper sets out to facilitate a better understanding of home modification and maintenance services provided under the HACC Program. It provides a snapshot of client characteristics and patterns of home modification and maintenance provision. This information has not previously been available and is potentially useful to housing policy makers and service providers alike. In this study no attempt to adjust the data to address non-responses or missing data have been undertaken. It simply reports service provision data as provided by HACC services under their funding agreements.

## 2. Methods

### *The dataset*

In 1997, the Australian Institute of Health and Welfare was commissioned to develop a national HACC Minimum Data Set (MDS) to address the shortcomings of existing data collections. Consequently, as of January 2001, all HACC-funded agencies were required to collect and report data on their individual clients, the client's circumstances, and the types and levels of assistance that were provided to clients. This data is reported to the HACC MDS National Data Repository on a quarterly basis and is available as the Home and Community Care Program National Minimum Data Set (HACC MDS). The HACC MDS is a codified data extract derived from the HACC National Data Repository System (see, Australian Institute of Health and Welfare, 1998a; 1998b; Department of Health and Aged Care, 1998). This report was based on the 2001/2002 HACC MDS. Consequently, this data set (and by extension, this paper) applies only to those who received some form of HACC funded assistance. The HACC MDS, then, is not exhaustive of everyone who received some form of home modification assistance in Australia. Rather, recipients of such assistance may have received funding from other organisations, such as Veteran's Affairs. The data set does, however, provide an insight into the prevalence of use and into the effectiveness of data collection in a substantial federal and state social agency.

The complete 2001/2002 HACC MDS collection consists of 14 variables relating to 589,552 clients. The data was collected by HACC agencies between 1<sup>st</sup> July 2001 and 30<sup>th</sup> June 2002. Approximately 74% of HACC-funded agencies successfully submitted MDS data in the period. There were large variations between the number of agencies that submitted MDS from the various States and Territories (range: 56%-94%) (see, Commonwealth Department of Health and Ageing, 2002). This variability in agency responses across states and territories is a limitation of the existing procedure for data collection. As discussed above, identifying such a limitation was in-part the aim of the HACC MDS, and can only lead to better procedures for data collection in the future.

As for interpretation of the current data, an overall response rate of 74% is noted to be very acceptable (see, Mangione, 1995). Regarding the lowest response rate of the individual states and territories (56%), Babbie (1982) suggests that this rate is adequate for analysis, while Mangione (1995) asserts that it is "barely acceptable". Based on these recommendations, the authors of this article advise that the state-related results be viewed as a guide that may under-represent service prevalence. However, there is no reason to assume that any particular age group, indigenous status or provision of service is under-represented.

## 3. Data preparation and descriptive statistics

This is a discussion of some variables within the 2001/2002 HACC MDS and their preparation. Some analysis was made as a necessary by-product of reporting on the variables and is not to be confused with the reporting and analysis, which is solely to do with HACC, funded retrofitting services.

The 2001/2002 HACC MDS comprises of 14 variables. In this study, analysis was limited to only four of these variables (i.e. 'Date of Birth', 'Home Modification – total cost', 'Indigenous Status' and 'Area of Residence'). Analysis was conducted on all 589552 clients listed in the 2001/2002 HACC MDS.

### ***'Date of Birth' variable***

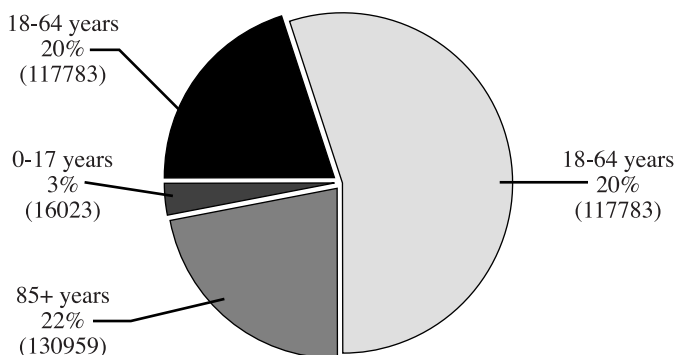
The ages of clients at the time of collection were calculated using the 'date of birth' variable. In the 2001/2002 HACC MDS, the 'date of birth' variable is given as a numeric variable in the day, month and year format. Due to the inconsistent number of digits in the 'date of birth' variable (some dates being seven digits long instead of eight digits due the absence of a leading 0) it was not possible to calculate age at the time of collection using inbuilt age calculation functions in the Statistical Package for Social Sciences (SPSS) or Microsoft Excel. Instead, a SPSS syntax (Appendix 1) was written to extract the last four digits of each 'date of birth' variable to yield the year of birth of each client. The age of clients at the time of data collection was calculated by substituting the client's year of birth from the year of data collection (2002).

Clients recorded in the 2001/2002 HACC MDS were found to have a mean age of 71.8 + 18.61 years. It should be noted that clients were recorded to range from less than one year old to 152 years. It is of course highly unlikely that there were clients that were 152 years old. The oldest person in history lived to be 122 (see, Wikipedia Encyclopedia, 2005). In this dataset 0.58% of clients were listed as between 101 – 152 years old, with 94.5% of these clients being either 101 or 102 years old. This is much higher than the 2400 people over 100 years old in Australian in 1998 (see, Australian Bureau of Statistics, 1999). When queried, the HACC Outcomes Section of the Australian Government Department of Health and Ageing acknowledged that this high number of centenarians is likely to be a result of recording error caused by unfamiliarity with the computer programs used in data collection, as this was the first collection of its kind. As these outliers were less than 1% of the sample, and there were no obvious parameters that could be used to determine a cut off point, the analysis was conducted with the complete 2001/2002 HACC MDS.

### ***Age groups used***

In the analysis conducted, the HACC Program clients were grouped into four distinct categories: '0-17 years', '18-64 years', '65-84' years and '85 years and above'. More than half of the clients were aged 65-84 (55%), followed by clients aged 85 and above (22%) and clients between 19-64 years (20%). As can be seen in Figure 1, clients who were aged between 0-17 years were the smallest group of clients (3%).

Figure 1: 2001/2002 HACC Program clients according to age groups (based on the 2001/2002 HACC MDS). Total numbers of clients are listed in brackets.



#### ***‘Home Modification – total cost’ variable***

The HACC Program defines home modifications as “structural changes to the client’s home so they can continue to live and move safely about the house. It will often include the fitting of rails, ramps, alarms or other safety and mobility aids” (see, Australian Institute of Health and Welfare, 1998a). In the HACC MDS, home modification services (‘home modification – total cost’ variable) are presented to the nearest dollar (mean = \$9.01, + 209.00; range = \$0 – \$29928. In order to facilitate analysis of home modification services, this variable was transformed into a new variable that was limited to two categories: ‘home modification service received’ and ‘home modification service not received’. Those who reported not paying a fee for home modifications were allocated to the latter and those who paid any fee for home modifications was allocated to the former as it was assumed that all home modification services received would have incurred at least a minimal cost. Figure 2, shows that only 3% of clients listed in the 2001/2002 HACC MDS received HACC funded home modification services.

#### ***‘Indigenous Status’ Variable***

The ‘Indigenous Status’ of clients was selected as a variable of major interest as housing is a known issue for this status group, however, HACC MDS has collected data relating to other ethnicities.

No manipulations were conducted on this variable. Figure 3, shows that while the majority (83%) of clients listed were not identified as indigenous, amongst indigenous clients, most were of Aboriginal but not Torres Strait Islander origin (3%), followed by clients that were of Torres Strait but not Aboriginal origin (< 0.1%), and finally by clients that were of both Aboriginal and Torres Strait Islander origin (< 0.1%). The 2001/2002 HACC MDS had a high number of clients whose indigenous status was ‘not stated or inadequately described’ (9%). The dataset also had a high number of cases where information regarding the client’s indigenous status was ‘missing’ (5%).

Figure 2: Proportion of clients who received, and did not receive HACC funded home modification services (based on the 2001/2002 HACC MDS). Total numbers of clients are listed in brackets.

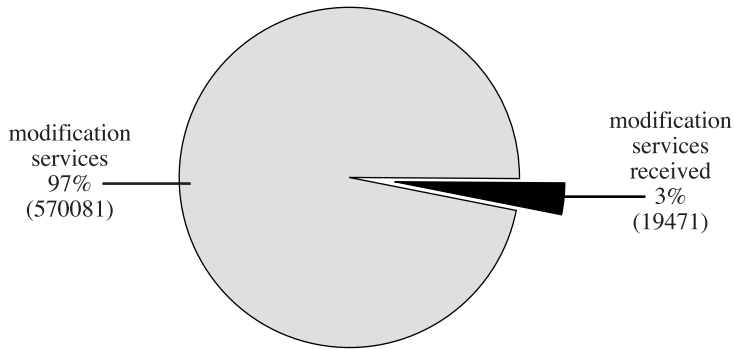
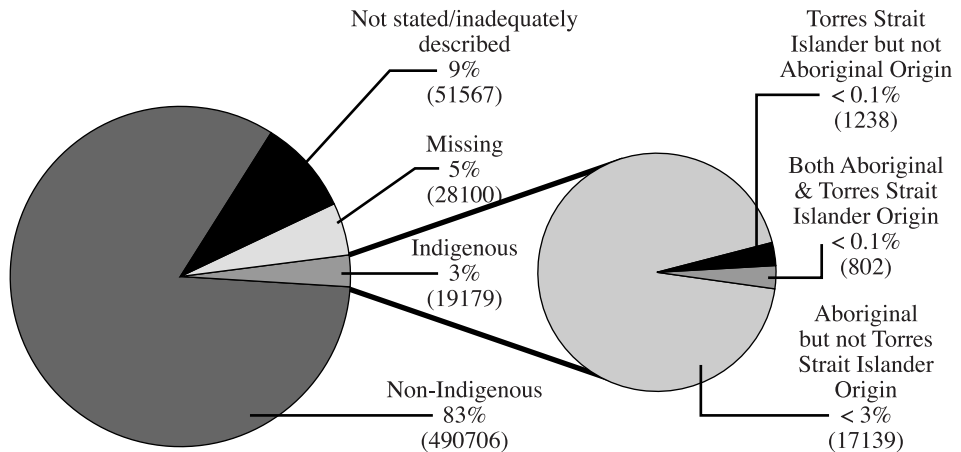


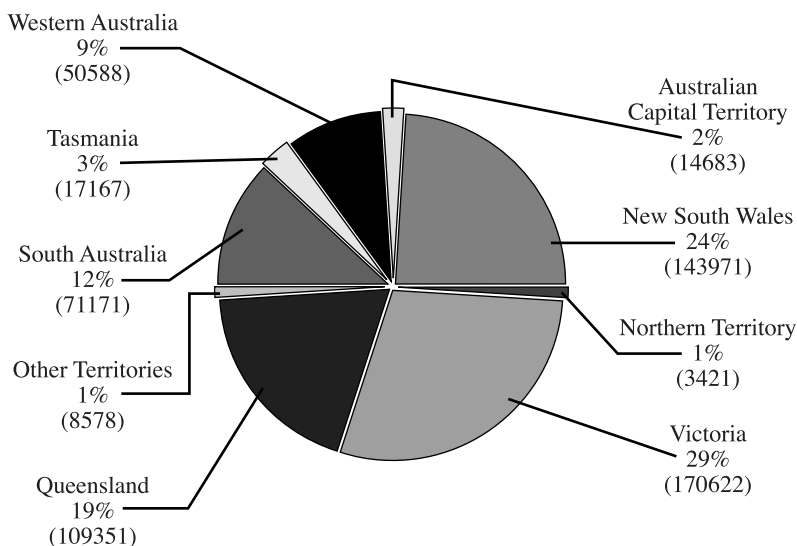
Figure 3: Indigenous status of 2001/2002 HACC Program clients (based on the 2001/2002 HACC MDS). Total numbers of clients are listed in brackets.



***‘Area of Residence’ variable***

No additional manipulations were conducted on the ‘Area of Residence’ variable. Therefore the nine ‘areas’ remained as presented in the HACC MDS. The areas as listed in the HACC MDS were: ‘New South Wales’, ‘Victoria’, ‘Queensland’, ‘South Australia’, ‘Western Australia’, ‘Tasmania’, ‘Northern Territory’, ‘Australian Capital Territory’ and ‘Other Territories’. Figure 4, shows that more than a quarter of clients were located in Victoria (29%) while the Northern Territory had the lowest proportion of clients for the period reported (1%).

Figure 4: 2001/2002 HACC Program clients according to area of residence (based on the 2001/2002 HACC MDS). Total numbers of clients are listed in brackets.



### ***Statistical analysis***

Crosstabulations were conducted using the SPSS (version 12.0.1) program. Counts and percentages were reported to describe the data and chi statistics were used to detect significant differences in home modification service recipients between the different states, age groups and indigenous status of the HACC Program clients.

## **4. Results and discussion**

### ***Occurrence of home modification costs according to state***

Only 3.3% of all clients received HACC funded home modification services (Table 1). The number of clients that received home modification services varied significantly between areas (chi-square=19085.500, df=8, p=0.000) and did not mirror the trend in total number of clients in each area. The most obvious incongruence in the two trends was Victoria. This state had the highest number of HACC clients, but had one of the lowest numbers of clients who received HACC funded home modifications for the 2001/2002 period. Clients in New South Wales received more than half the home modifications (56%), the next largest being Queensland with (33%). While the Northern Territory reported almost no home modification services being provided (Table 1, Figure 5).

This difference in HACC funded home modification services between the different States and Territories is not surprising given the structure of the HACC Program. Although the HACC Program is a national program, each State and Territory has its own 'State and Territory Annual Plan' that is jointly approved by the Commonwealth and State and

Territory Governments. These Plans, developed by the State or Territory, specify program priorities and fund allocations as seen appropriate by each State or Territory. As such, the type of service funded, and the level of funding varies between the Australian States and Territories (see, Home and Community Care, 2002).

Figure 5: 2001/2002 HACC Program clients that received home modification services according to area of residence (based on 2001/2002 HACC MDS). Total numbers of clients are listed in brackets.

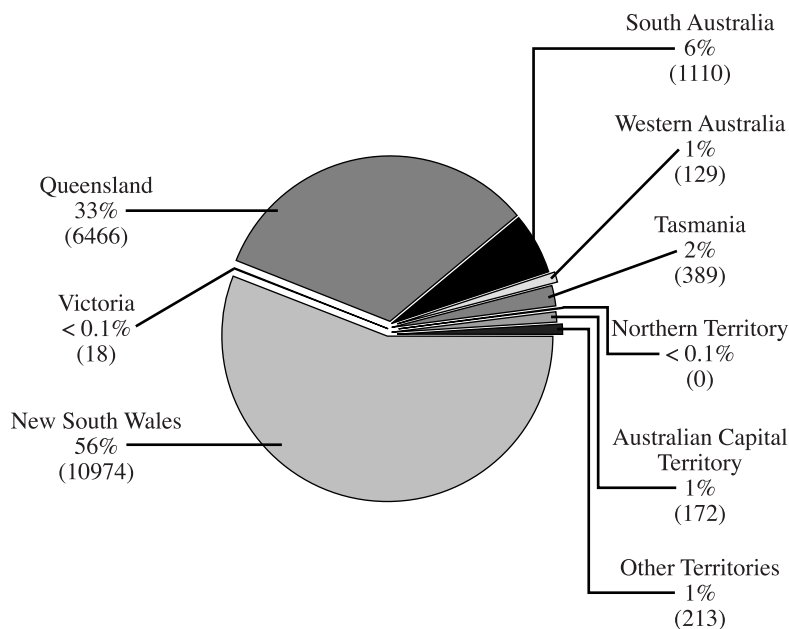


Table 1 Proportion of 2001/2002 HACC service clients that received home modification services according to area of residence (based on 2001/2002 HACC MDS)

Area of Residence	Received Home Modification Services			Total HACC Service Clients	
	Count	% Area	% Total	Count	% Total
New South Wales	10974	7.6	1.9	143971	24.4
Victoria	18	0.0	0.0	170622	28.9
Queensland	6466	5.9	1.1	109351	18.5
South Australia	1110	1.6	0.2	71171	12.1
Western Australia	129	0.3	0.0	50588	8.6
Tasmania	389	2.3	0.1	17167	2.9
Northern Territory	0	< 0.1	< 0.1	3421	0.6
Australian Capital Territory	172	1.2	0.0	14683	2.5
Other Territories	213	2.5	0.0	8578	1.5
Total	19471	3.3	3.3	589552	100.0

The implication of this state based HACC funding structure is illustrated in the home modification services trend seen in New South Wales and Victoria. Both these states have similar population trends (see, Australian Bureau of Statistics, 2003). However, New South Wales had significantly more clients (absolute number, and proportion of clients within state) who received HACC funded home modification services in 2001/2002 compared to Victoria. This is due to the fact that the New South Wales HACC State Plans include fund allocation for home modification services (see, Department of Ageing, Disability and Home Care, NSW, 2002) while in Victoria, funds are not allocated for home modification services (see, Department of Human Services, 2003). Instead in Victoria, HACC allocations are disbursed to local government associations under the “property maintenance program” (see, Department of Human Services, 2004). Typically clients either contact the service provider directly or may be referred following an allied health referral or a ‘Home Renovation Service’ inspection service a collaborative program between Archicentre Limited (Australia’s largest architectural home advisory service) and the Department of Human Services (the department responsible for the HACC Program in Victoria) (see, Archicentre, 2005).

These results demonstrate the significant differences in the number of clients who received HACC funded home modifications between the various states and territories, and highlights the implication of the state based funding structure of the HACC Program. However, these results do not give an indication of the prevalence of home modifications in the various states. Further analysis that includes an exhaustive list of the other various programs that fund home modifications (e.g. the ‘Home Renovations Service’ in Victoria, the Department of Housing scheme in Queensland and the national Veterans Affairs home modification program) is needed to assess differences in the rate of home modifications between the different Australian States and Territories.

### ***Occurrence of home modification costs according to age of clients***

The trend in HACC funded home modification service recipients for 2001/2002 according to age group mirrors that of the age group breakdown of all clients listed in the HACC MDS for that period. Figure 6, shows that most of these home modification services were received by clients aged between 65-84 years (63%). This was followed by clients aged 85 years and over (23%), clients between 18-64 years (13%) and finally by clients aged between 0-17 years (1%).

In all four age groups, less than 4% (range=1.3% - 3.8%) of clients received home modification services (Table 2). This percentage may be a reflection of other sources of funding of home modifications (e.g. self-funded) or of inaccuracies in service provider data.

The recipients of HACC funded home modification services varied significantly between the age groups (chi-square=899.281, df=3, p=0.000), with older clients receiving more home modification services compared to younger clients. This trend of older clients receiving more home modification services is expected, as the rate of disability is known to increase with increasing age. People above the age of 60 are more than ten times as likely to report a disability compared to people below the age of five years. These disabilities

often lead to restriction in core activities such as self care and mobility. Approximately 41% of people aged 60 years and over reported needing assistance, because of disability or old age, to manage health conditions or cope with everyday activities. This need for assistance increases as people age and become frailer (84% compared with 26%). People aged 85 years and over were more than three times as likely to report a need for assistance compared to those aged 60–69 years (see, Australian Bureau of Statistics, 2005).

Figure 6: 2001/2002 HACC service clients that received home modification services according to age groups (based on 2001/2002 HACC MDS). Total numbers of clients are listed in brackets.

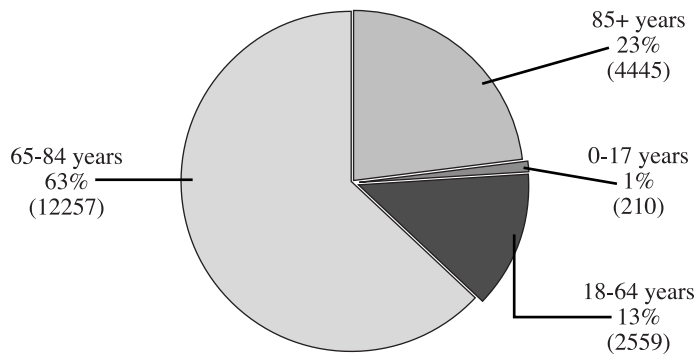


Table 2 Proportion of 2001/2002 HACC service clients that received home modification services according to age (based on 2001/2002 HACC MDS).

Age Group	Received Home Modification Services			Total HACC Service Clients	
	Count	% Group	% Total	Count	% Total
0 - 17 years	210	1.3	< 0.1	16023	2.7
18 - 64 years	2559	2.2	0.4	117783	20.0
65 - 84 years	12257	3.8	2.1	324787	55.1
85 years and above	4445	3.4	0.8	130959	22.2
Total	19471	3.3	3.3	589552	100.0

Given the large percentage of older people that experience restrictions in core activities and the fact that a large percentage of older people are living in the community, it is surprising that less than 4% of clients aged 65 and above received home modification services funded under the HACC program. In 1998 10% of people aged 65 and over had to move in the five years prior due to ‘profound’ or ‘severe’ activity restriction caused by frailty or disability. The likelihood of having had to move was reported to be even higher among people aged 85 and above (see, Australian Bureau of Statistics, 1999, 2005). This low proportion of older clients that received HACC funded home modification services

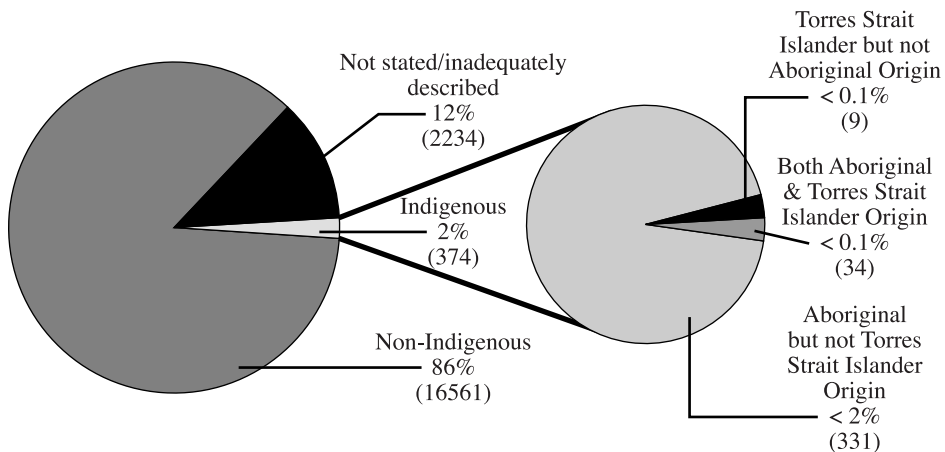
and the high rate of moving among older people might indicate that the home modification needs of these age groups are not being adequately met by this service.

Being able to match an assessment of need against actual service provider data would aid in assessing if more HACC funds should or should not be allocated to home modification services. Given that population demographics and HACC fund allocation varies between the different States and Territories, assessments of need should be compared to the appropriately identified policy, population distribution, geographic and other variables framing difference. Actual assessment of need as compared to provider data might usefully indicate where discrepancies are occurring and further may shed light on whether these discrepancies can be attributed to; a lack of access to these services, lack of information about eligibility, policy differences, and/or a combination of these factors.

***Occurrence of home modification costs according to indigenous status of clients***

HACC funded home modification service recipients for the 2001/2002 period were significantly different between indigenous status groups (277.146, df.=4, p=0.000). Most home modification services were received by non-indigenous clients (86%). Only 2% of home modification services were received by indigenous clients (Figure 7, Table 3). The total proportion of indigenous clients that received home modification services in 2001/2002 is similar to the estimated proportion of indigenous Australians in 2001 (2.2-2.4%) (see, Australian Bureau of Statistics, 2002c).

Figure 7: 2001/2002 HACC home modification service events according to indigenous status of users (based on 2001/2002 HACC MDS). Total numbers of clients are listed in brackets. Only valid records of the MDD are used ('Missing' = 5%).



Comparisons within the indigenous status groups indicated that overall, non-indigenous clients had a larger proportion of clients that received HACC funded home modification services compared to indigenous clients as a group (Table 3). This is contrary to what is expected. Indigenous clients are expected to have a comparatively higher proportion of home modification service recipients given that indigenous Australians have a higher rate of disability (see, Australian Bureau of Statistics, 2004). This may indicate that the home modification needs of indigenous clients are not being met by this service.

The trend of lower than expected home modification services recipients among indigenous clients could be driven by a variety of factors that have been related to the low use of general health services by indigenous people. These factors range from logistical factors such as remoteness, to cultural barriers and the willingness of Indigenous people to use health services (see, Australian Bureau of Statistics, 2003). A combination of aspects such as community control of services, gender of health service staff, the availability of indigenous staff, and the degree of proficiency in spoken and written English have been found to affect the latter factors (see, Ivers et al., 1997). It is possible that similar factors have led to the low number of indigenous clients that received HACC funded home modifications services for the 2001/2002 period. Another possible variable affecting the low number of indigenous recipients could be the fact that the majority of indigenous people in Australia live in rented or temporary accommodation (see, Australian Bureau of Statistics, 2002d).

**Table 3 Proportion of 2001/2002 HACC service clients that received home modification services according to indigenous status of clients (based on 2001/2002 HACC MDS).**

Indigenous Status Group	Received Home Modification Services			Total HACC Service Clients	
	Count	% Group	% Total	Count	% Total
Aboriginal but not Torres Strait Islander Origin	331	1.9	0.1	17139	3.1
Torres Strait Islander but not Aboriginal Origin	9	0.7	<0.1	1238	0.2
Both Aboriginal and Torres Strait Islander Origin	34	4.2	<0.1	802	0.1
Total Indigenous	374	2.0	0.1	19179	3.3
Neither Aboriginal nor Torres Strait Islander Origin	16561	3.4	2.9	490706	87.4
Not stated/ inadequately described	2234	4.3	0.4	51567	9.2
Total Valid HACC service Clients	19169	3.4	3.4	561452	95.2
Missing	0	0	0	28100	4.8
Total	0	0	0	589552	100.0

Clients whose indigenous status was ‘not stated/inadequately described’ had one of the highest proportion of HACC funded home modification service recipients (Table

3). It has been reported that some HACC agencies do not report the indigenous status of any of their clients. It has also been identified that agencies that have the lowest proportion of indigenous clients often have the highest proportion of records that are 'not stated/inadequately described' or 'missing' (see, Australian Institute of Health and Welfare, 2004). It is possible that these factors could lead to an under representation of indigenous clients who receive HACC funded home modification services.

It is essential to ascertain if the HACC Program meets the home modification needs of Australians of all indigenous status adequately. This is particularly important for indigenous Australians given the high incidence of disability in this population. It is thus vital for the HACC Program to increase the HACC MDS data quality in relation to client's indigenous status to facilitate a better understanding of whether the home modification needs of clients of all indigenous status are being met.

## **5. Suggestions for data quality improvement**

There appears to be three critical issues arising from our analysis which related to narrowness and limitations of the of the data set itself, lack of meta-analysis at the service type level and the overarching issues associated with the day quality. First, the data set is currently very narrow regarding home modifications and home maintenance with only two questions directed to this area. This has lead to assumptions being made, for example, that all home modifications cost something, when this may not be the case. More questions in this area (for example, "1. Have home modifications been made?", "2. If so, how much did they cost?", and "3. What were they?" rather than only enquiring as to the cost) will reduce the error made by such assumptions and provide important information. It would also be helpful to collect data about the actual type of home modifications (i.e. ramps, rails and bathroom, kitchen modifications etc.) and type combinations most commonly provided as information about this would be extremely useful for best practice and purchasing decision making.

Second, while each State/Territory is currently responsible for preparing data based on their Commonwealth/State HACC agreement accountabilities (i.e. NSW's HACC Data Cube Project), previously only very limited national meta-analysis at the program type level has been available. Consequently, national equity and policy variance have not been apparent and, as a result, research into particular service patterns is nascent at best. This is particularly important in the context where in each State and Territory there are different processes, limited budgets and historical differences associated with home modification and maintenance service rollout and accessibility.

Third, it appears that the majority of data error is occurring at the point of data entry. Those who are entering the data are builders and administrators who are entering the data as a necessary component of their funding contract. Although a national training program is provided, a high staff turnover and local issues such as workloads may see providers making errors or neglecting to enter data. Providing assistance at point of entry and ensuring the user-friendliest methods of data entry may assist.

## 6. Conclusion

While this preliminary analysis needs to be treated with caution because of missing data and identified issues with data quality it does clearly point to inequity in service provision. Indeed, some of the most significant variances according to area of residence may be attributable to the state based funding structure of the HACC Program. For instance, the trend of older clients receiving more home modification services compared to younger clients is as expected. However, the low proportion of aged clients receiving these services might indicate that the home modification needs of aged clients are not being adequately met. Similarly, the low proportion of indigenous recipients could also indicate that the home modification needs of this group are not being fully met by this service.

The fact that strong conclusions cannot be drawn from this data because of quality of data issues indicates that it is essential that the issue of the HACC MDS data quality be improved for the future. Long term monitoring of high quality data will provide valuable information that will aid HACC Program policy changes.

On a wider scale, if retrofitting is to be better targeted and governmental expenditures on housing are to be made more cost-effective, an urgent need exists for all involved in the housing design and development process to ensure that the housing produced in the twenty-first century and beyond reflects the full diversity of contemporary Australian housing types and includes the changing and diverse nature of the entire Australian population.

## Appendix 1

SPSS syntax used to extract user's year of birth from the 'date of birth' variable of the HACC MDS

```
string year (a10).
compute year=substr(string(dob,f10.0),length(string(dob,f10.0))-3).
exe.
```

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