

# Understanding The Needs Of An Aging Population For Better Bathroom Design Outcomes.



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# Ageing Joyfully



Living a good life longer (nearly a decade longer) is something to celebrate, with the majority ageing at home within their community. But statistically living longer can mean increasing disability with over a third of people experiencing mild or moderate disability as they age<sup>1</sup>. Although only one percent of Australians aged 65-74 live in cared accommodation<sup>2</sup> such as nursing homes, the percentage increases to nearly a quarter (24 percent) once they reach 85 years old. Nearly half of Australians in permanent residential aged care have depression, compared to 10-15 percent of older Australians living in the community<sup>3</sup>.

This creates a growing market opportunity for design to make a difference, as by 2056 people over the age of 65 will comprise just under one quarter of the Australian population<sup>3</sup>. The market is already significant with the number of Australians aged 65 and over already larger than the population of the ACT and closing in on the population of Tasmania. Of course, collaborative and functional design by itself cannot resolve these problems, nor is it expected to.

But it's crucial that businesses and organisations involved in providing products and services for older Australians collaborate with each other and especially with older Australians, to ensure that the foundations to life quality are prioritised no matter what the dwelling. Further, people now reaching the eligibility age for the age pension are significantly wealthier in real terms, on average than those aged 75 years and over<sup>4</sup>. This finding was supported by the national Livable bathroom survey<sup>5</sup>.

The importance of the physical environment for ageing is well documented and bathroom design is not just about sanitation. For older people it also influences a range of social and health measures including quality of life and self-care. Supportive environments are essential to maintaining quality of life and independence. Inaccessible, difficult and hazardous environments can compromise older people's ability to carry out activities of daily living<sup>6</sup>.

Designing bathroom environments that suit the needs and abilities of older people can help reduce barriers to functioning and allow more people to age-in-place for longer periods. Despite the importance of the environment for ageing, relatively few prior studies have focused on the bathroom environment as a whole, most have mainly concentrated on specific tasks, namely bathing and toileting<sup>7</sup>.

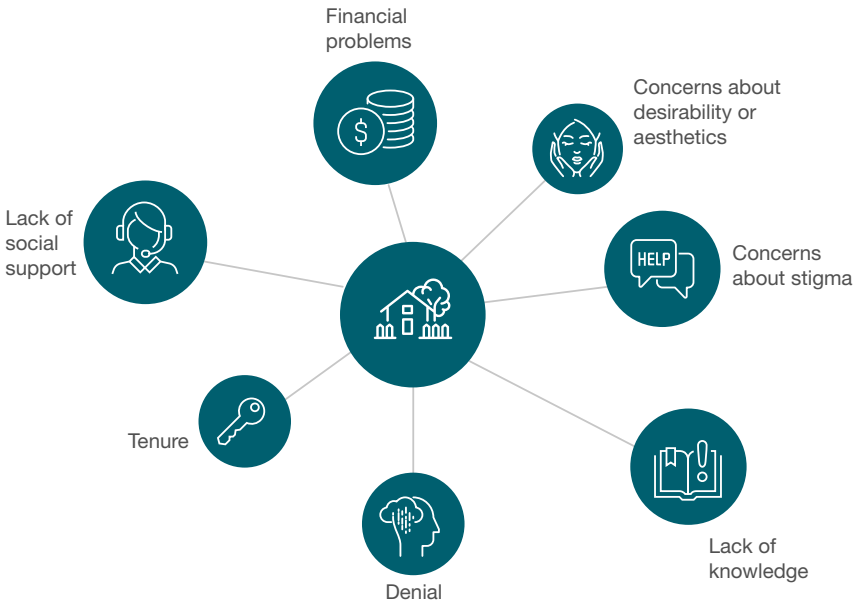
# Caring through design

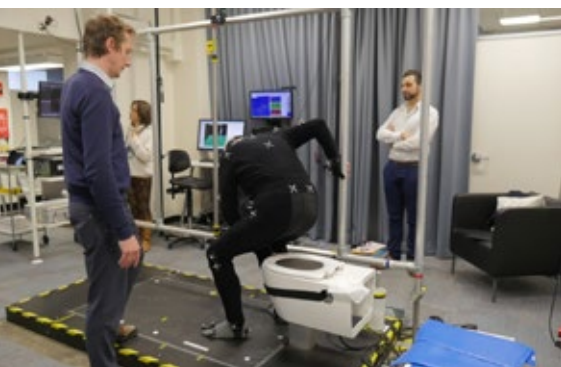
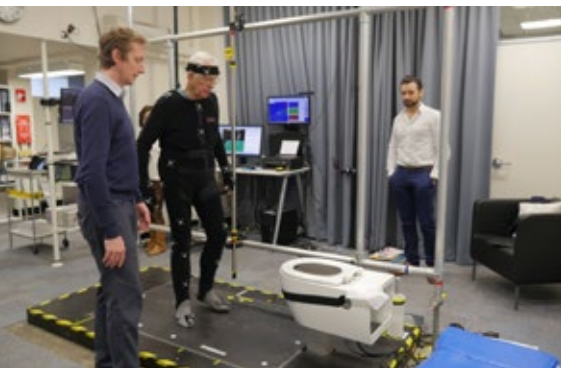
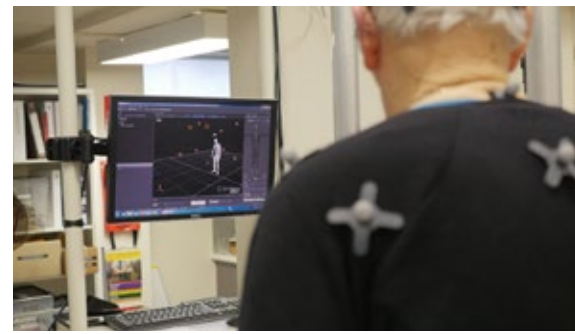
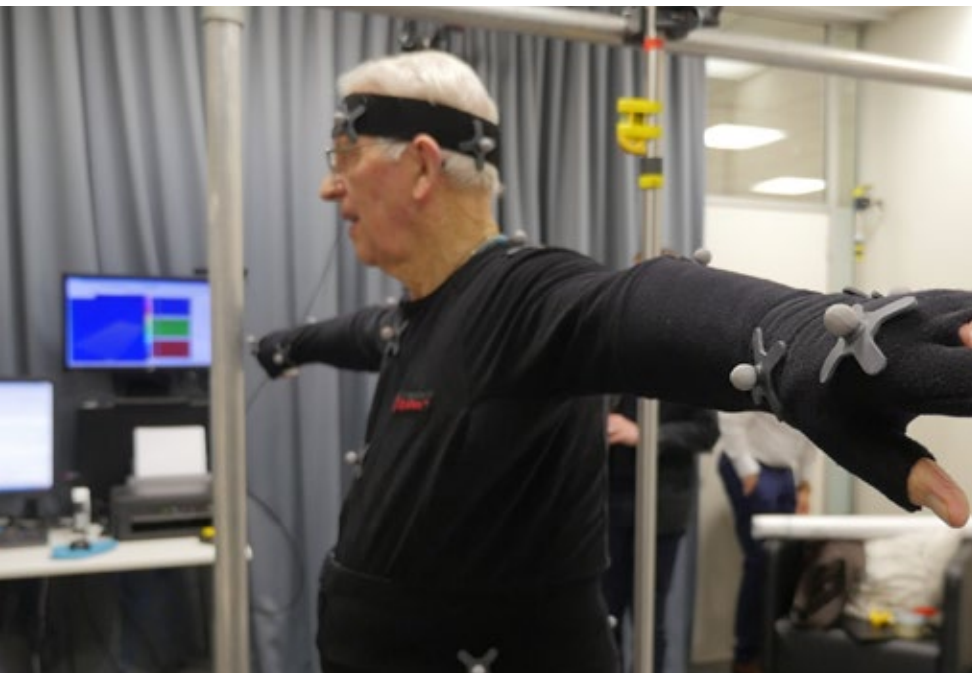
Recent research has shown that design can directly substitute for care by up to 42% and can also result in an 40% overall improvement for Health-Related Quality of Life<sup>8</sup>. This effect is even greater for informal care and concerned changes to the bathroom (78.3%).<sup>9</sup>The benefits of design interventions are clear but a systemic review of barriers to modification of homes<sup>10</sup> highlighted seven key concerns that made them less likely: financial problems, lack of knowledge, lack of social support, denial, concerns about stigma, concerns about desirability and/or aesthetics, and tenure. These barriers can fall into two categories: psychological and practical. Psychological resistance

is more common and is also prevalent in older people's attitudes to more traditional/commercial aged care environments. The Livable Bathrooms for Older People Project was a large multi-disciplinary, multimethod project developed to collect, analyze and synthesise older people's physical dimensions and abilities in the context of their domestic bathrooms into information that can be used to improve design outcomes. The project was funded as an Australian Research Linkage Grant with GWA Int as the industry partner. The project took place over four years (2012-2016). It was a response to lack of standards for bathrooms outside of public restrooms and

lack of any existing empirical anthropometric or biomechanical data about how older Australians use their bathrooms. One of the central approaches of the Livable Bathroom for Older People Project, was The 'Livable Bathroom' survey which was distributed to a representative cross-section of older Australians from all states and territories over the age of 60 using a database of 16,524 older persons provided by the Australian Electoral Commission and is likely the largest design survey of its kind. The survey found significant safety and comfort concerns. Critical to the project's success was the inclusion of a participatory co-design group<sup>11</sup>. The Co-Designers participating on

## 7 barriers to home modification





this project assisted by:

1. Guiding the development of and providing feedback on the research tools, namely the Livable Bathrooms Survey and the Livability Lab Protocol.
2. Helping to understand, from an older person's perspective, which bathroom features and characteristics function well, and which don't.
3. Working with professional designers to co-create design concepts and solutions.

Working with the co-designers has revealed a dissatisfaction with conventional bathroom design and an enthusiasm for more usable, safer and enjoyable bathrooms and bathroom products – with innovative technology actively desired provided it is in response to a real need and is usable and reliable. Co-designers were unimpressed with technology for novelties sake. One key finding was that people view the bathroom as a complete environment that supports routines rather than a set of distinct fixtures and products. This can have negative consequences where peo-

ple use products for purposes other than what they were designed for. We found that holding on to towel rails, basins and shower screens to support transfer tasks and maintain balance was common. Small changes such as correct placement of toilet roll holders and correctly placed grab rails led to improvements in comfort and convenience for tasks that are repeated several times a day - this could lead to benefits over many years. These are examples of issues that are best resolved at the design stage of a bathroom project.



# The Livable Bathrooms for Older People Project

## Five overlapping phases of work:

1. Establishment of a Codesign project reference panel comprising 5-12 older persons. (twelve meetings) and with an additional (three) meetings for the support device extension.
2. National Survey (4469 responses).
3. 80 in-depth Interviews.
4. Laboratory work around toilet activities with 31 older people aged 60 to 90 years of age.
5. Laboratory work around use of support devices with 12 older people 64-91 years of age.

## Key findings from the National Survey



A high proportion of respondents of both sexes had a Body Mass Index (BMI) within the obesity range, with nine per cent of women and three per cent of men appeared to be severely or very severely obese range.



Over half (**51%**) of respondents had bathrooms with separate showers with raised perimeters (hobs) making them inaccessible to wheelchairs and a potential trip hazard.



A surprisingly large number (**62%**) said that they rarely or never used their bathroom to take baths.



Over a third (**37%**) indicated that they went to the toilet, 2-3 times during the night and increased frequency (3-4 times a night) was weakly correlated to medication usage.



A quarter (**25%**) rated bathroom size being as poor and just under a half (**48%**) specifically mentioned insufficient space to dress/undress in the bathroom.



A fifth (**20%**) rated winter temperature in bathrooms as poor.



A fifth (**20%**) rated the quality of the bathroom floor to prevent slipping as poor.



Significant safety concerns were expressed, included not being able to call for help in an emergency (**18%**), not being able to get up after a fall (**15%**), slipping in the shower or on wet floors (**11%**).

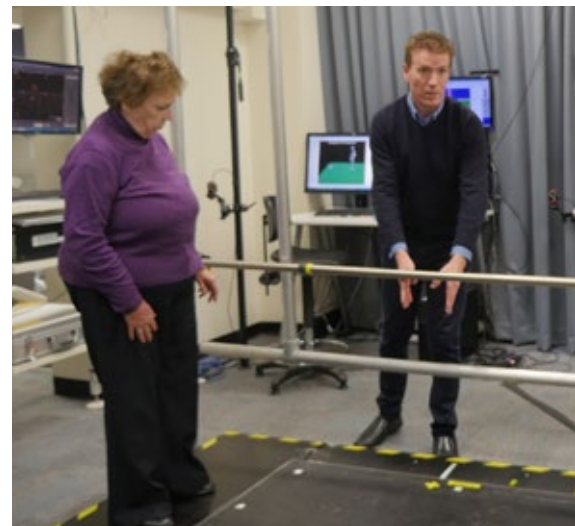
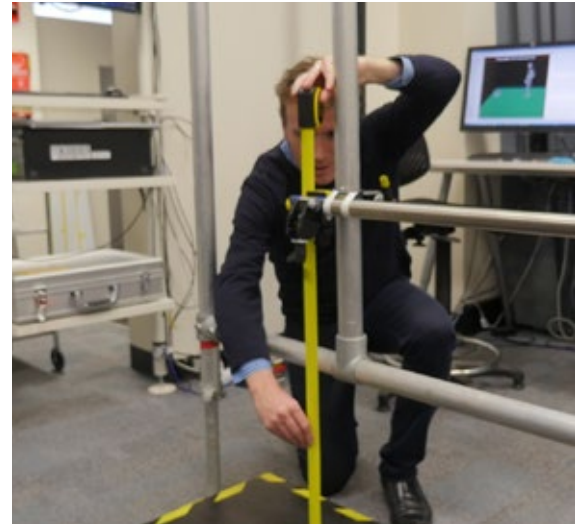


# When accessibility leads to inability

**A**ccessibility standards were found not to be the preferred design configuration for the older people we worked with. Toilet seat heights that are too low can cause difficulty sitting and standing but also toilet seats that are too high for an individual can also cause safety and comfort problems. While standard height toilets can be too low for easy sit to stand for some older people, raised or accessible height toilet seats can cause uncomfortable pressure zones at the seat. If the seat is too high for an individual they have difficulty placing their feet securely on the floor and this can lead to postures unsuitable for evacuation, instability and difficulty placing feet safely during standing - leading to smaller users having to almost jump down.

This is one example of where collaboration is key — one size doesn't necessarily fit all and can actually achieve the opposite outcome

well-meaning contractors intend. Dialogue between designers, architects and home owners is vital to ensuring functional safety and as technology advances in areas like robotic furnishings we will likely see far greater adaptability and mass customisation of assistive products.



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# Keeping up appearances



Assistive products can have strong associations with disability and loss of independence. Design can be a powerful means of reducing the perceived stigmatising effects of supportive products. Design that promotes or aligns with positive motivations such as independence, forward thinking, improvement in lifestyle and living space is more likely to be accepted by the older people that would benefit from it. Designing bathrooms in anticipation of future need can be a powerful way of choosing long term independence. Supportive features installed early can ensure many years of safer, more comfortable use.

Fixtures and bathroom environments were often discussed in terms of aesthetics in the co-design group. Modern bathroom design was appreciated, as was luxurious bathroom spaces. Hotel bathrooms were often used as examples of good bathroom design. They were considered luxurious with hardwearing, long-lasting fixtures. Newer fixtures such as mixer taps and lever tap designs were discussed but there was no consensus on preference. However, the emphasis centred on fixtures and the bathroom environment looking good as well as being supportive. Aesthetics for older people, much like those of younger generations are personal preferences, again highlighting that further conversations and team work is needed among all involved.

One member of a co-design group remembered the time her husband was prescribed grab rails “The shudders went through, it has come to this!” However, after having the rails for a long time she found herself using them more and more, said she wouldn’t be without them and thought they would benefit everyone. ‘If it were standard it would be normal’ and so would have no stigma of being associated only with the frail elderly.

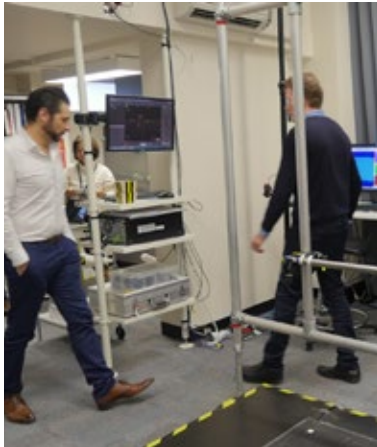
The older people who participated in our research identified many ways in which bathroom design could be improved. The active collaboration between older people, researchers and the Caroma design team helped realise attractive solutions that would offer multiple benefits over the long term.



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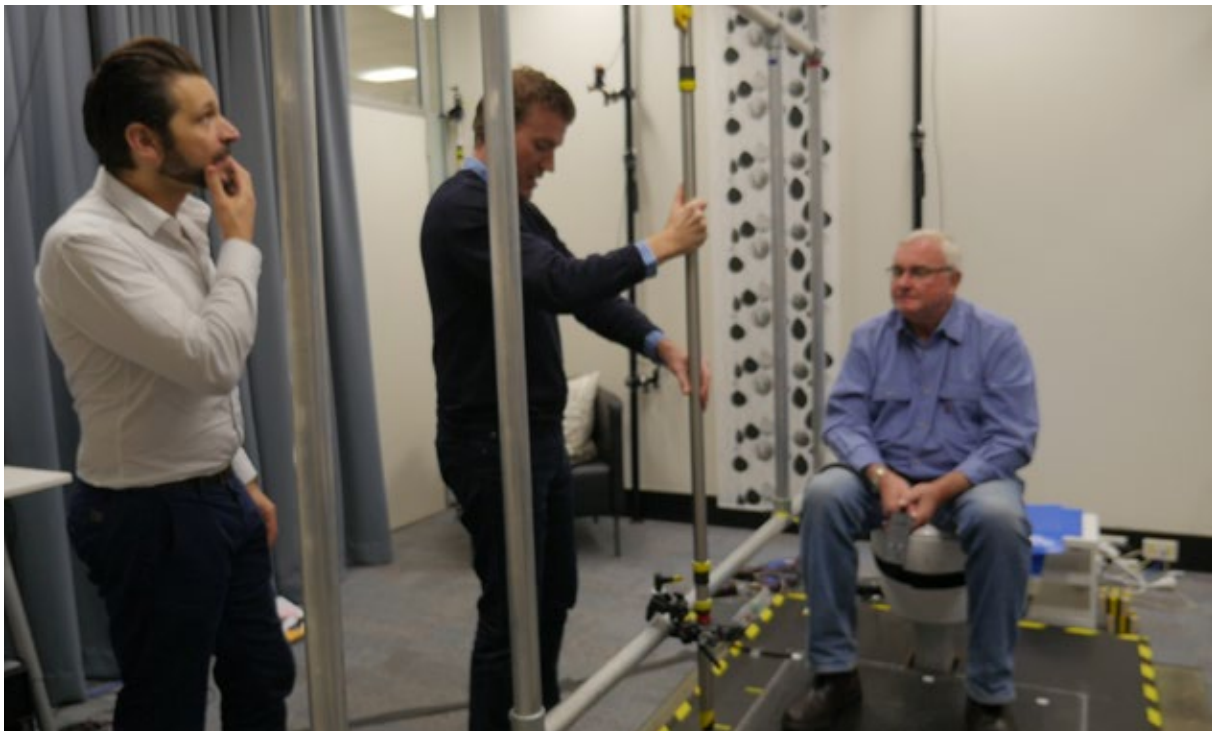
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Better product design helped to reduce the barriers to adopting more supportive features. Some design approaches that were developed through the co-design process were:

- Adaptable - products that could be easily changed as the individuals needs changed for example toilet armrests that could be added when recovering from knee surgery but removed if no longer needed.
- Multi-functional - when a product has a purpose in addition to the support function then there is an additional reason to install it other than physical need, an attractive grab rail can function as a sturdy convenient towel rail.
- Integrated design - where many assistive products look like bolted on after thoughts products that include supportive elements that are aesthetically integrated into the whole bathroom design appear more attractive and harmonious.
- Safety for everyone - design that can make the bathroom safer for all people not just people with reduced mobility is appealing to everyone. Concern for children, pregnant women and people with injuries helped justify more functional design. Or as one co-designer put it: "What is necessary for us is a luxury for the younger ones".



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# What this means for the future of design



For designers, working collaboratively with older people provides a rapid feedback on assumptions and design proposals. Older people have at least as varied aesthetic preferences as any other cohort, and they have a powerful connection between home and identity. For decision-makers, data can be analysed, synthesised and translated into multiple forms; however, the topics explored in this research are best understood through open-minded first-hand experience with people. Sharing information from multiple perspectives on the multi-factorial problems involved can be a productive way of co-creating innovative concepts and purposefully converging on optimal solutions.

Ageing is something none of us can escape, and with Australians living longer, wealthier lives, more people are ready to embrace bathroom design that goes beyond the functional and into the aspirational.

This presents many opportunities for designers, architects and decision makers involved in the design of physical environments for older Australians to design bathroom products and spaces that are safer, more inclusive and contribute to the overall wellbeing of all Australians.

In order to challenge common psychological barriers to the adoption of assistive products, the future of design for older Australians must take a more informed and personalised approach that considers both the functional and aesthetic desires of potential residents.



<sup>1</sup>Australian Government, Dept of Health (2019). Home Care Packages Program: Data report 2nd Quarter 2018-19, available online from [https://www.gen-agedcaredata.gov.au/www\\_ahwgen/media/Home\\_care\\_report/HCP-Data-Report-2018-19-2nd-Qtr.pdf](https://www.gen-agedcaredata.gov.au/www_ahwgen/media/Home_care_report/HCP-Data-Report-2018-19-2nd-Qtr.pdf)

<sup>2</sup>Australian Bureau of Statistics, (2017) 2071.0 - Census of Population and Housing: Reflecting Australia - Stories from the Census, 2016. Web report available online <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2071.0~2016~Main%20Features~Ageing%20Population~14>

<sup>3</sup>Australian Institute of Health and Welfare, (2018). Older Australia at a glance. Web report available from <https://www.aihw.gov.au/reports/older-people/older-australia-at-a-glance/contents/summary>

<sup>4</sup>Cullen, D. (2019, May) Background Paper 2 - Medium- and long-term pressures on the system: the changing demographics and dynamics of aged care. Available from <https://agedcare.royalcommission.gov.au/publications/Documents/background-paper-2.pdf>

<sup>5</sup>Eardley, T (2014, September) Livable Bathrooms for Older People: Survey Analysis. Unpublished manuscript.

<sup>6</sup>Mintzes, A., Bridge, C., & Demirbilek, O. (2015). Development of a National Survey on Aging and the Domestic Bathroom: The Livable Bathrooms Survey. In DS 80-1 Proceedings of the 20th International Conference on Engineering Design (ICED 15) Vol 1: Design for Life, Milan, Italy, 27-30.07. 15 (pp. 575-584).

<sup>7</sup>Molenbroek, J. F. M., Mantas, J., & De Bruin, R. (2011). A Friendly Rest Room: Developing toilets of the future for disabled and elderly people. Assistive Technology Research Series, volume 27.

<sup>8</sup>Carnemolla, P., & Bridge, C. (2016). Accessible housing and health-related quality of life: measurements of well-being outcomes following home modifications. ArchNet-IJAR, 10(2).

<sup>9</sup>Carnemolla, P., & Bridge, C. (Accepted for publication). Housing Design and Community Care: How Home Modifications Reduce Care Needs of Older people and People with Disability. Int. J Environ Res Public Health.

<sup>10</sup>Bridge, C., Phibbs, P., Gohar, N. & Chaudhary, K. (2007). Identifying barriers to Home Modification: Evidence based practice report. Available online from <https://www.homemods.info/resources/hminfo-research-publications/evidence/identifying-barriers-to-home-modifications-systematic-review>

<sup>11</sup>Mintzes, A., Demirbilek, O. R., Sweatman, P., Davey, S., & Bridge, C. (2015). Co-Design Report, Livable Bathrooms for Older People (1). Sydney: Blurb Books.

