



Home modification to reduce falls - appears cost-effective in NZ

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We have just published a modelling study on a home safety and modification programme to prevent falls in older people. This work suggests that this intervention could produce considerable health gain and be cost-effective at a health district level in New Zealand. But in this blog we discuss possible implementation options and the desirability of also considering group exercise programmes, which have additional advantages.

New Zealand has made good progress on reducing falls in the hospital sector as per work led by the Health Quality & Safety Commission [1] ([see also this HQSC online guidance to health workers on preventing falls in multiple different settings](#)). Nevertheless, for falls prevention in older people in the community there are still some knowledge gaps - including about the cost-effectiveness of home safety assessment and modification (HSAM). HSAM involves a personalised assessment of injury hazards in the home (generally by an occupational therapist), followed by the systematic removal of these hazards [2]. These include removing tripping hazards, adding grab bars in bathroom and toilet areas, adding

hand rails to stairways, and improving home lighting [2].



So we took a model that we had previously built [3], and made some enhancements, along with adapting it to a health district level. This district was Counties Manukau District Health Board in South Auckland, which hosts 42,000 people aged 65+ years. In our model the intervention effectiveness estimates came from a systematic review, and NZ-specific intervention costs were extracted from a NZ trial [4].

What this new study found

In our just published [study \[5\]](#) of the 65+ age-group in this particular health district, the HSAM programme was estimated to achieve health gains of 2800 quality-adjusted life-years (QALYs; 95% uncertainty interval [UI]: 547 to 5280). The net health system cost was estimated at \$8.44 million (95% UI: \$663 to \$14.3 million). The cost-effectiveness was very favourable at \$5480 per QALY gained (95%UI: cost saving to \$15,300). This suggests that this intervention is very good value-for-money for the NZ health system. (Nevertheless, we note that other BODE³ work shows that many health sector interventions which are actually *cost-saving* provide other options for policy-makers - see our series of blogs on the [BODE³ Interactive League Table](#) which also shows the other falls prevention results we have modelled).

Targeting HSAM only to people age 65+ or 75+ with previous injurious falls was estimated to be even more cost-effective (ICERs: \$700 and \$832, respectively) with the latter intervention often being cost-saving. There was no evidence for differential cost-effectiveness by sex or by ethnicity: Māori vs non-Māori.

Where to from here for NZ?

So given these results (and the other NZ and international literature that we cite elsewhere [3] [6]), NZ policy-makers can have reasonable confidence that the HSAM intervention is a good intervention to invest in if they wish to act in this domain. It is also likely that these results are generally applicable to other health districts in NZ – but total benefits may be greatest in places where household crowding is worst (since then more other people sharing the residence with the older person will also benefit from falls reduction).

But given competition for health sector resources that might restrict funds for upfront investments, health sector policy-makers could target this intervention eg,:

- Targeting to adults aged 65+ or aged 75+ with a prior injurious fall would reduce upfront intervention costs. Such approaches would also provide the opportunity to collect better data on the exact costs and field application of HSAM, before any further scaling up.
- Targeting to adults aged 65+ living in rental accommodation or who live in deprived areas. These approaches may have the added advantage of probably contributing to health equity benefits. Fortunately there is some NZ evidence concerning acceptability of HSAM-related interventions by Māori as per an evaluation of ACC's "My Home is My Marae" approach to injury prevention for whānau [7].
- Targeting to homes where there are two adults aged 65+.
- Targeting to homes where there are older adults with known risk factors for falls (certain medications, chronic conditions that impact on balance and muscle strength etc).
- Instead of investing in HSAM interventions themselves, DHBs could work collectively to encourage higher levels of government to instigate a comprehensive national-level HSAM programme. This would then help achieve economies of scale – and make the intervention even more cost-effective. Alternatively, they could encourage central government to legislate so that building codes require that all new homes and all rental properties meet minimal safety standards. Similarly, a warrant of fitness programme [8], could be applied to all existing houses.

Another issue is that NZ could potentially benefit from research that makes head-to-head comparisons of HSAM with exercise interventions for which the evidence is also favourable and probably stronger [9]. (Indeed, our own modelling work supports this view – which we will cover in a future blog). Furthermore, exercise interventions can have the additional advantages of providing social contact if it involves group exercise (as opposed to exercising at home). Exercise also provides benefits in terms of chronic disease prevention, eg, traditional Chinese exercise in older people [10]. Exercise interventions are also able to prevent falls both inside and outside the home environment, whereas HSAM is restricted to the home environment (though HSAM does prevent injuries in younger people as well – as per this NZ randomised trial [4] and the associated cost-benefit analysis [11]). It might be that various combinations of HSAM and exercise programmes could be considered. Similarly, comparisons are needed with other interventions that have been suggested to be cost-effective in the literature: expedited cataract surgery and psychotropic medication withdrawal [12]. But while more research might be needed for fine tuning such options, there is a reasonable case for policy-makers to consider the HSAM intervention now.

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