Reducing waiting times for cataract surgery is good value-for-money for falls prevention

29 August 2019

Nick Wilson, Matt Boyd, Adeline Kho, Graham Wilson

In an article published in the *New Zealand Medical Journal* today, we discuss our recent modelling work on expediting cataract surgery in NZ. In this blog we summarise the key findings and make comparisons with other falls prevention interventions.

NZ has made good progress on reducing falls in hospitals through the Health Quality and Safety Commission's 'Reducing harm from falls' programme. High-level evidence also suggests that community strength and balance exercise programmes, and multi-component community interventions (usually including exercise and home safety assessment and modifications) are also effective. BODE^3 modelling has shown that these interventions are also good value for money.

However, there is also evidence that multifactorial risk factor assessment and interventions tailored to individual fallers' risks help to prevent falls. A key risk factor is the presence of cataracts, and cataract surgery has been shown in a randomised controlled trial (RCT) to reduce falls (Harwood et al, 2005).

Expedited cataract surgery

Cataracts tend to develop as we age and are the most common cause of impaired vision.

Cataract surgery removes the opacified lens and inserts an intra-ocular lens. The result is near normal unaided visual acuity in 92% of cases. However, there are often substantial wait times for cataract surgery in the NZ public health system, with a total wait time from first appointment with a GP or optometrist, to actually having the surgery performed, of over 300 days in many cases.

To explore this issue we started with a model we had previously used to assess the cost-effectiveness of exercise programmes and home safety modifications. We made some enhancements to the model so that it could be used to model the impact of cataract surgery. The intervention that we modelled was provision of cataract surgery by private providers, immediately following diagnosis, paid for by DHBs in order to avoid the nearly year-long waiting list times. The idea is that falls are less common following surgery, so the earlier the surgery is done, the less falls older people will have. Cataract surgery also improves vision, so there are multiple reasons to suppose that sooner is better when it comes to cataract surgery.

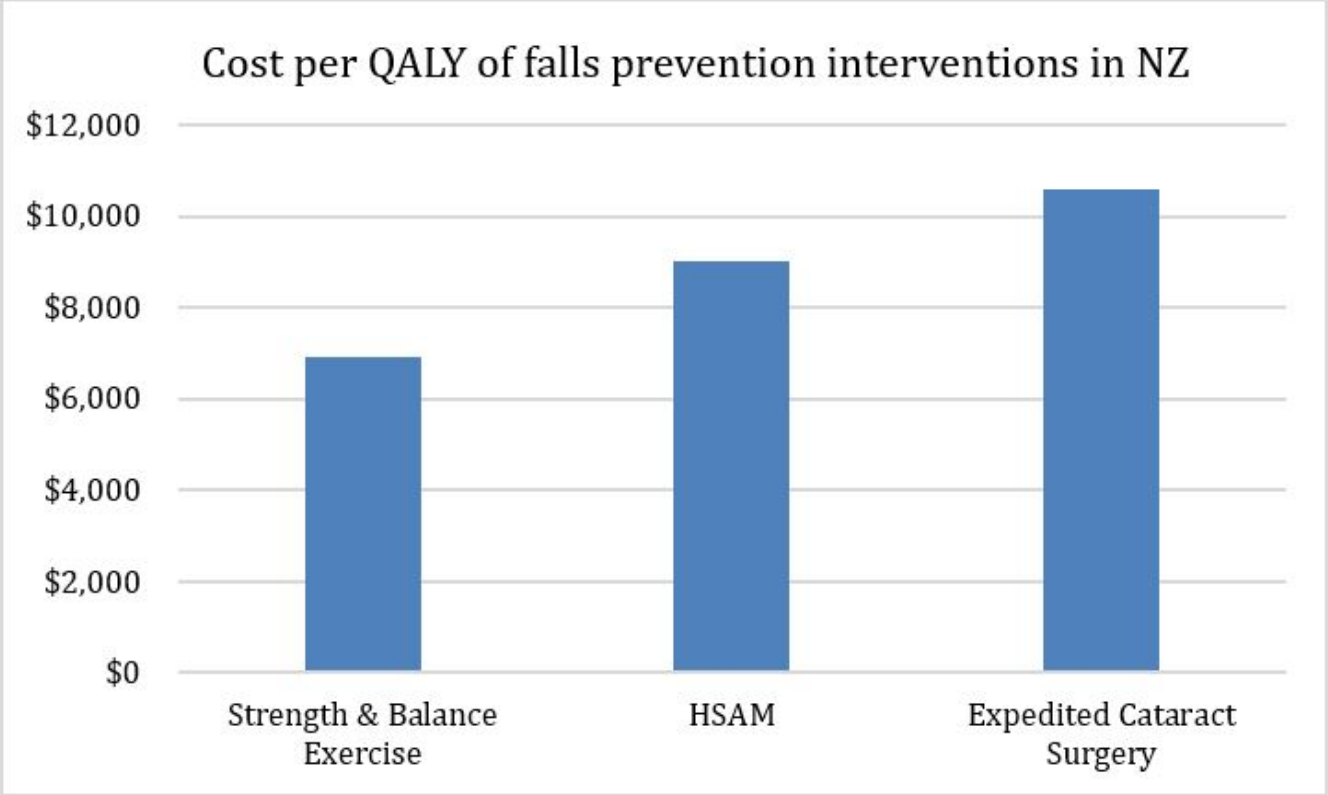
What our new study found

Our study used a Markov macro-simulation model that estimated quality-adjusted life-years (QALYs) gained in the 65+ age-group (Boyd et al, 2019a). It took a health system perspective and used a discount rate of 3%. Intervention effectiveness estimates came from a RCT of women over 70 years and a cohort study of men and women over 65 years which confirmed the RCT findings. We also used NZ-specific intervention costs.

In our new study, expediting cataract surgery for one year was estimated to achieve health gains of 240 quality-adjusted life-years (QALYs; 95% uncertainty interval [UI]: 161 to 360). The net health system cost was estimated at $2.43 million (95% UI: $2.02 to $2.82 million). The cost-effectiveness was very favourable at $10,600 per QALY gained (95%UI: $6030-15,700). This suggests that this intervention is very good value-for-money for the NZ health system.

Targeting expedited cataract surgery only to people age 65-70 was estimated to be the most cost-effective ($7000 per QALY gained). There was no evidence for differential cost-effectiveness by sex or by ethnicity: Māori vs non-Māori.

In the context of falls prevention results we have modelled, expediting cataract surgery is not quite as cost-effective as strength and balance exercise programmes or home safety assessment and modification interventions for making the homes of older people safer. The figure below from our just published viewpoint article (Boyd et al 2019b) shows the comparative cost-effectiveness for each of these interventions as represented by cost per QALY gained.



HSAM: home safety assessment and modification

Sources: Expedited cataract surgery (Boyd et al, 2019a), Home safety assessment and modification (Pega et al. 2016), Strength and balance exercises (Deverall et al. 2018).

Where to from here for NZ?

Given these results, NZ policy-makers can have reasonable confidence that expediting cataract surgery is a good intervention to invest in if they wish to act in this domain. In our study we modelled the 2011 population, in which there were 10,945 relevant cases of cataract surgery in those over 65 years. However, the number of people either blind or visually impaired by cataracts continues to increase (eg, one projection was growth to 22,155 cases by 2017 (Access Economics, 2009). So this intervention might have a larger impact over time.

To maximise the cost-effectiveness, priority could be given to expediting cataract surgery in the youngest of the older population (some of these younger people in the 65-69 year age-group may still be working in the formal economy and this is likely to therefore increase benefits from a societal perspective).

Options for DHBs include investing more in cataract surgery provision in their own facilities or making greater use of the private sector (potentially with larger bulk purchase arrangements to reduce costs). But additional private provision would need to be managed appropriately so that it does not impinge on public hospital capacity as often the same pool of surgeons is involved.

However, we must also see this intervention in the context of other interventions for falls prevention. Exercise interventions have the potential to be implemented at scale, and can benefit all older people, not just those with cataracts. Exercise also has the additional advantages of possibly providing social contact if it involves group exercise (as opposed to

exercising at home) and benefits in terms of chronic disease prevention. So expansion of exercise programmes might be an even higher priority area for further falls prevention investment.

It is also important to note that other BODE^3 work shows that many health sector interventions are actually *cost-saving.* These provide other options for policy-makers providing healthcare interventions – see our series of blogs on the BODE^3 Interactive League Table.

References

1. Access Economics. *Clear Focus – The economic impact of vision loss in New Zealand 2009.* Canberra: VISION 2020 Australia in support of the VISION 2020 New Zealand Trust, 2010.
2. Boyd M, Kvizhinadze G, Kho A, Wilson G, Wilson N. Cataract surgery for falls prevention and improving vision: modelling the health gain, health system costs and cost-effectiveness in a high-income country. *Inj Prev* 2019a;(E-publication 20 June). pii: injuryprev-2019-043184. doi: 10.1136/injuryprev-2019-043184.
3. Boyd M, Kho A, Wilson N, Wilson G. Expediting cataract surgery in New Zealand is cost-effective for falls prevention and improving vision—so what might be the next steps? *N Z Med J* 2019b;132(1501).
4. Deverall E, Kvizhinadze G, Pega F, et al. Exercise programmes to prevent falls among older adults: modelling health gain, cost-utility and equity impacts. *Inj Prev* 2018 doi: 10.1136/injuryprev-2016-042309 [published Online First: 2018/01/25]
5. Pega F, Kvizhinadze G, Blakely T, et al. Home safety assessment and modification to reduce injurious falls in community-dwelling older adults: cost-utility and equity analysis. *Inj Prev* 2016;22(6):420-26. doi: 10.1136/injuryprev-2016-041999 [published Online First: 2016/05/26]

Public Health Expert Briefing (ISSN 2816-1203)
