Modeling the population level impact, costs and benefits of falls prevention measures

A collaborative project between researchers and policy officers at Monash, Ballarat and Flinders and New South Wales Universities and NSW Health, funded by the Commonwealth Department of Health and Ageing, and NHMRC

www.monash.edu.au/muarc
Project team

Investigators
Lesley Day (Monash University)
Caroline Finch (Ballarat University)
James Harrison (Flinders University)
Pam Albany (NSW Health)
Soufiane Boufous (U NSW)
Leonie Segal (Monash University)
Project team

Research team
Wendy Watson – Project leader
Effie Hoareau
Mary O’Hare

Advisors
Alex Donaldson
Stuart Newstead

MONASH University
Accident Research Centre
Background

• Last 10 years, dramatic increase in evidence base for falls prevention among community dwelling older people
• Cochrane review published 2005 identified 6 different interventions likely to be beneficial
• But policy directions not immediately clear
### Background

- Interventions reduce falls to varying degrees
- Target different sub-groups
- Intervention uptake and compliance may vary
- Different levels of resources required
- Cost-effectiveness not immediately apparent
- Considerable benefit of modeling the impact of proven interventions
Aim

To enhance the ability of the health sector to prevent falls through effective planning and efficient use of resources by developing a statistical model to enable population level assessment of the impact of proven interventions on falls among older Australians.
Objectives

• To forecast the population level impact of proven falls interventions at both state, territory and national levels over a 5-year period
• To calculate the cost-effectiveness of each intervention
• To design and test formats for the delivery of the model outputs to policy officers
Objectives

- 15 week Tai chi group exercise program
- OT prescribed home hazard assessment for those with history of falls in previous 12 mths
- Individually prescribed strength and balance program
- Withdrawal of psychotropic medication
- Multi-disciplinary screening and intervention for at risk groups
- Cardiac pacing for those among whom falls are a consequence of cardiovascular disturbance
Where does this fit in?

- Will help in deciding which proven interventions will provide a good investment
- More to policy development and implementation than evidence from RCTs on effective interventions
- Other important aspects of portfolio selection include equity, acceptability, timing and sustainability
Methods

- RCT trial participants often a selected group eg., Wolf Tai Chi trial, Cumming home environment trial
- Model potential falls reductions if these programs were delivered at the population level
- Estimate the numbers of people to whom this program would apply 2009-2013
- Use participation rate in trials to estimate the proportion who would take up programs
Methods

- Estimate numbers of falls and falls hospitalisations which would be prevented, assuming same level of falls reduction as achieved in trial
- Estimate the potential reduction in the falls hospitalisation rates
- Estimate cost of implementation for each intervention
- Estimate cost per fall prevented
Methods

- Sensitivity analysis will assess effect of variations in specific variables eg., uptake
- Extremes analysis will assess effect of an extreme value specific variables
- Threshold analysis will indicate values of uptake and drop out needed before change in relative cost-effectiveness ranking of the modeled interventions
Methods

• Iterative process will help identify preferred formats for communicating model outputs to policy officers, and provide opportunity for other input to project
## Results example: Vic 2006-10

<table>
<thead>
<tr>
<th></th>
<th>Group based exercise 70+</th>
<th>Home based exercise 80+</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uptake</strong></td>
<td>28%</td>
<td>28%</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td>49,715</td>
<td>43,927</td>
</tr>
<tr>
<td><strong>Expected falls</strong></td>
<td>64,631</td>
<td>58,864</td>
</tr>
<tr>
<td><strong>Falls prevented</strong></td>
<td>4,474</td>
<td>23,282</td>
</tr>
<tr>
<td><strong>Hospitals prevented</strong></td>
<td>447</td>
<td>2,328</td>
</tr>
<tr>
<td><strong>Direct costs saved</strong></td>
<td>$6.7 mill</td>
<td>$34.8 mill</td>
</tr>
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Note that the home-based program is much more resource-intensive and cost of implementation is really needed to establish its investment potential.
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Conclusions

- Prediction of falls prevented at population level critical for ultimate determination of cost-effectiveness of proven programs
- Data required for predictions not always published in trial papers
- Assumptions and sensitivity analysis
- Considerable scope for evidence-based epidemiological modeling to support policy decisions