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*A research partnership between Sydney Local Health District and the  
University of Sydney in musculoskeletal health and physical activity*

# Research update

**Prof Cathie Sherrington**

**BAppSc (Physio), MPH, PhD, FAAHMS, FACP**



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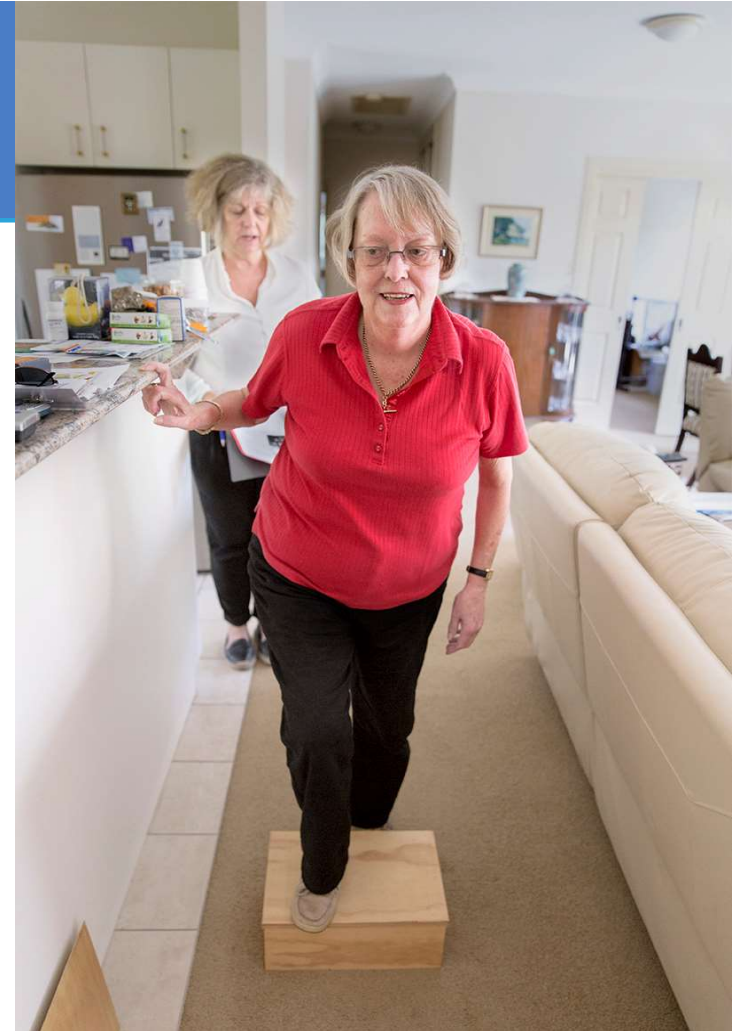
# Outline

- Data update
- Evidence update
- Implementation update



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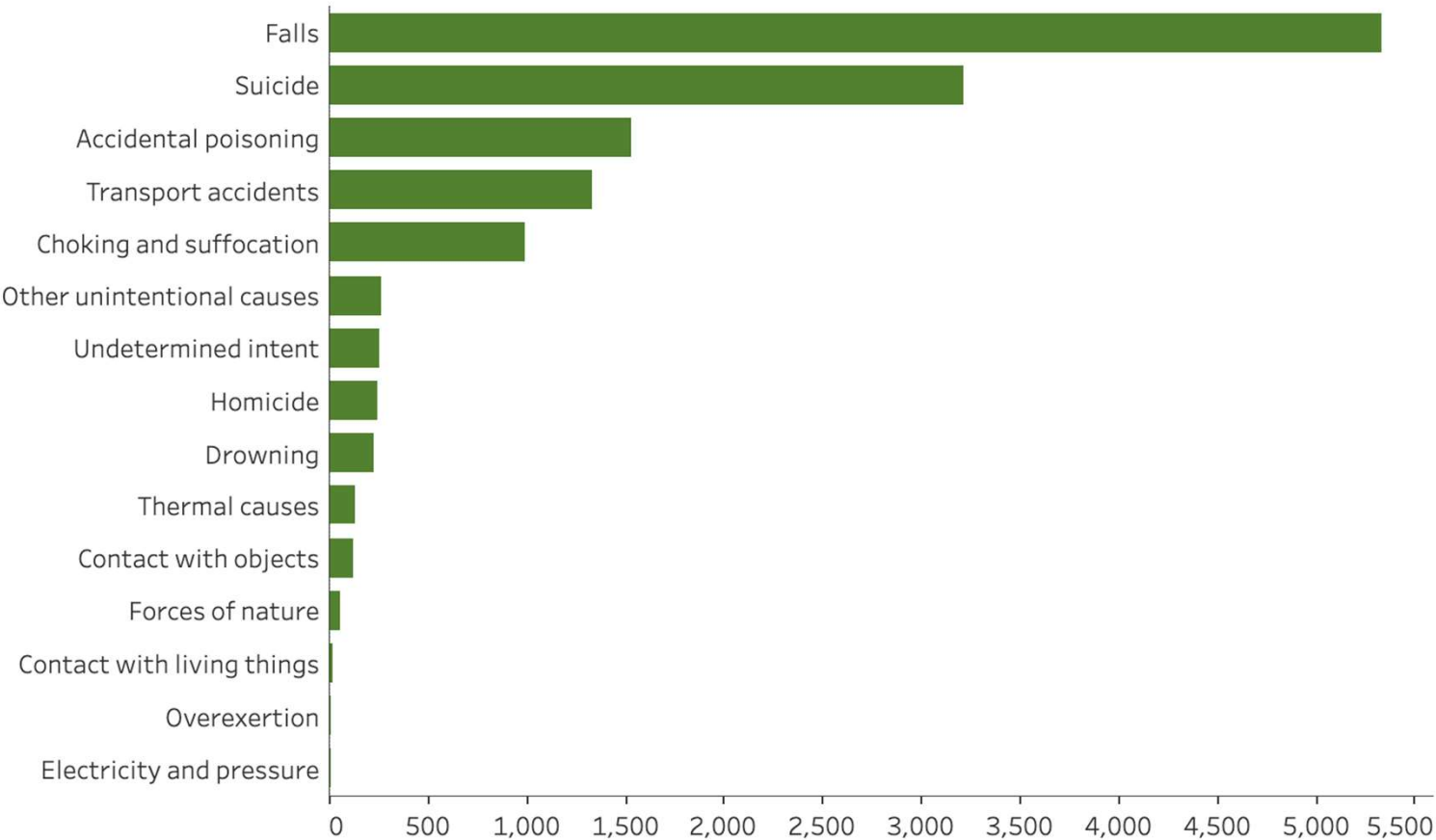
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# Injury in Australia

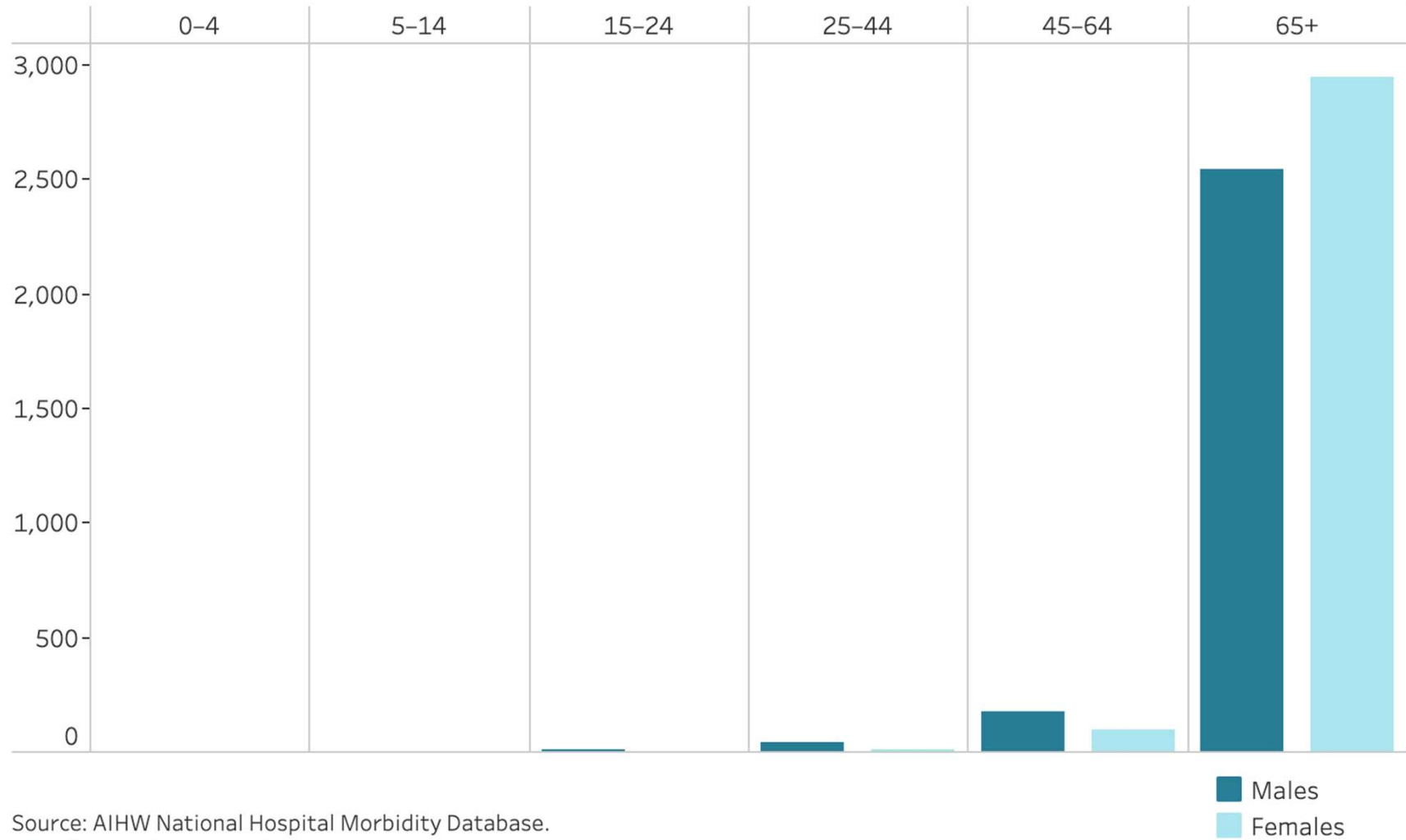


Web report | Last updated: 24 Oct 2023 |

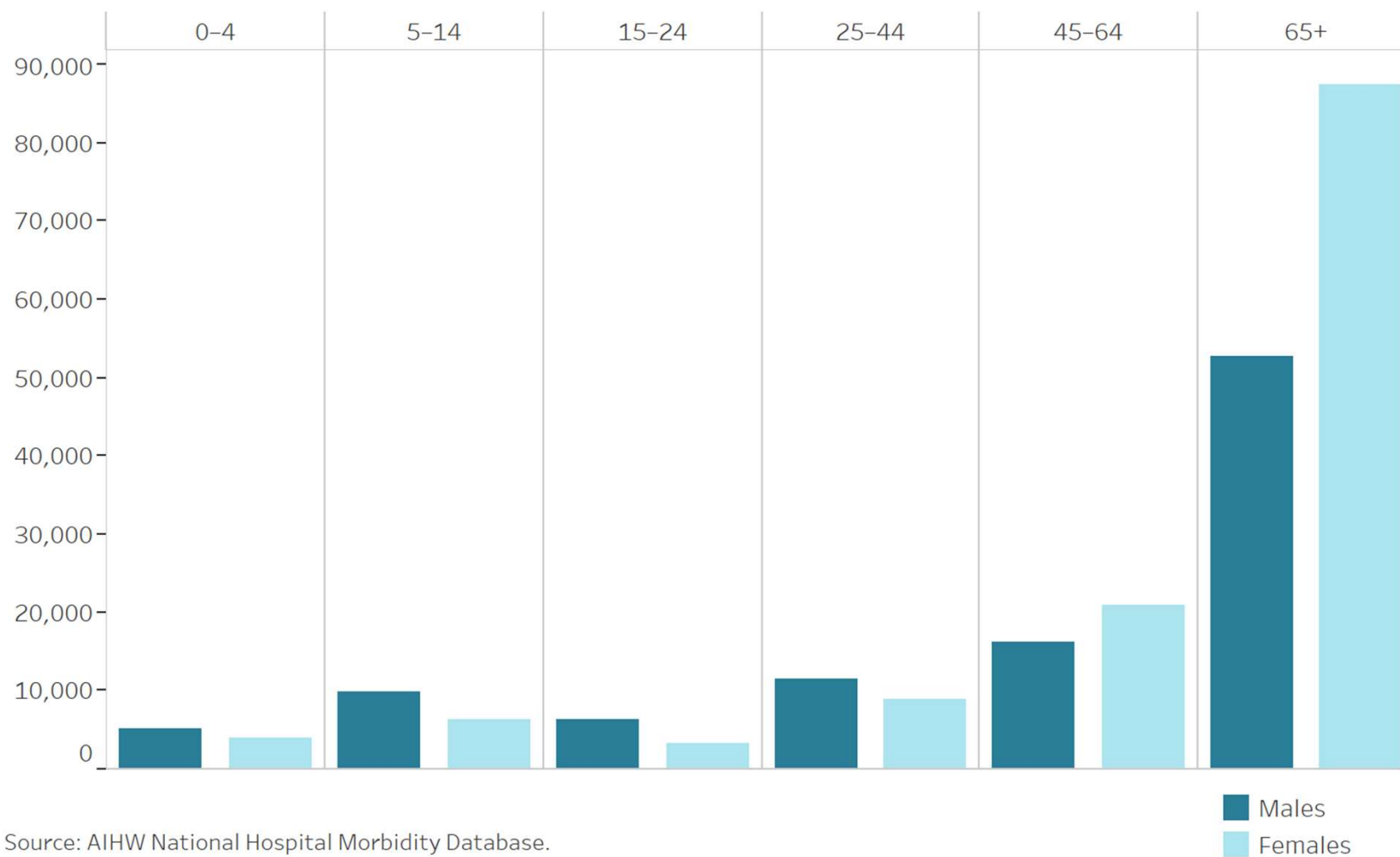
## Injury deaths in Australia 2021-2



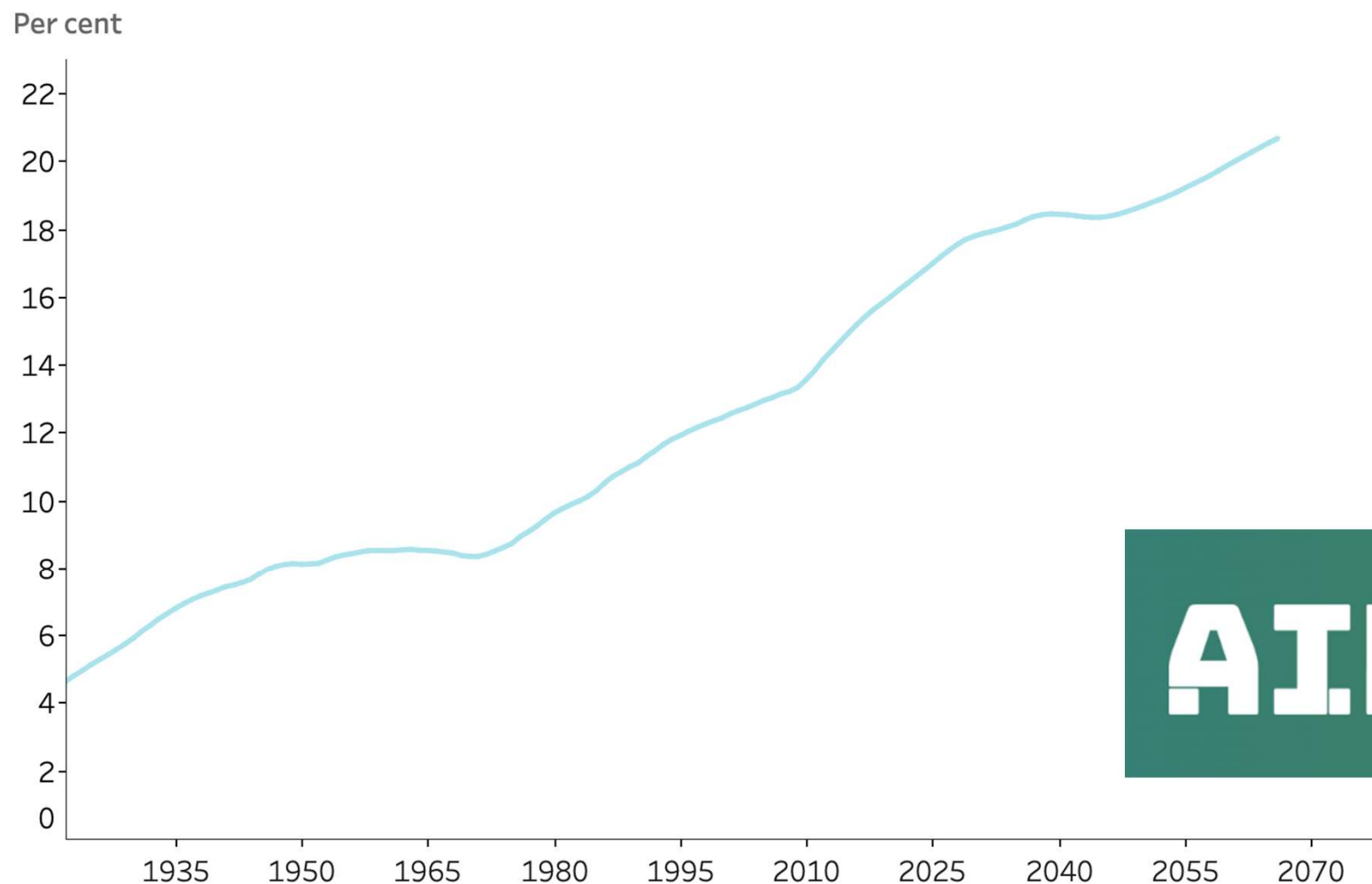
## Falls deaths in Australia 2020-21 by age



## Falls hospitalisation in Australia 2021-2 by age



**Figure 1.1: Percentage of the Australian population aged 65 and over, at 30 June, over time**





## Research

### Global, regional, and national burden of diseases and injuries for adults 70 years and older: systematic analysis for the Global Burden of Disease 2019 Study

*BMJ* 2022 ; 376 doi: <https://doi.org/10.1136/bmj-2021-068208> (Published 10 March 2022)

Cite this as: *BMJ* 2022;376:e068208

- Globally the population of older adults has increased since 1990 and all cause death rates have decreased for men and women.
- However, mortality rates due to falls increased between 1990 and 2019.
- The probability of death among people aged 70-90 decreased, mainly because of reductions in non-communicable disease.
- Globally disability burden was largely driven by functional decline, vision and hearing loss, and symptoms of pain.



# Outline

- Data update
- Evidence update
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## Exergame and cognitive training for preventing falls in community-dwelling older people: a randomized controlled trial

[Daina L. Sturnieks](#) , [Cameron Hicks](#), [Natassia Smith](#), [Mayna Ratanapongleka](#), [Jasmine Menant](#), [Jessica Turner](#), [Joanne Lo](#), [Carly Chaplin](#), [Jaime Garcia](#), [Michael J. Valenzuela](#), [Kim Delbaere](#), [Robert D. Herbert](#), [Catherine Sherrington](#), [Barbara Toson](#) & [Stephen R. Lord](#)

*Nature Medicine* **30**, 98–105 (2024) | [Cite this article](#)



Rate of falls over 12 months significantly reduced in the exergame training group compared with control (incidence rate ratio = 0.74, 95% confidence interval = 0.56–0.98), not statistically different between the cognitive training and control groups (incidence rate ratio = 0.86, 95% confidence interval = 0.65–1.12).



Participants 65+ ( $n = 769$ , 71% female) living independently in the community randomised to one of three arms:





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**CHANGE**  
Coaching for Healthy AGEing



Original research



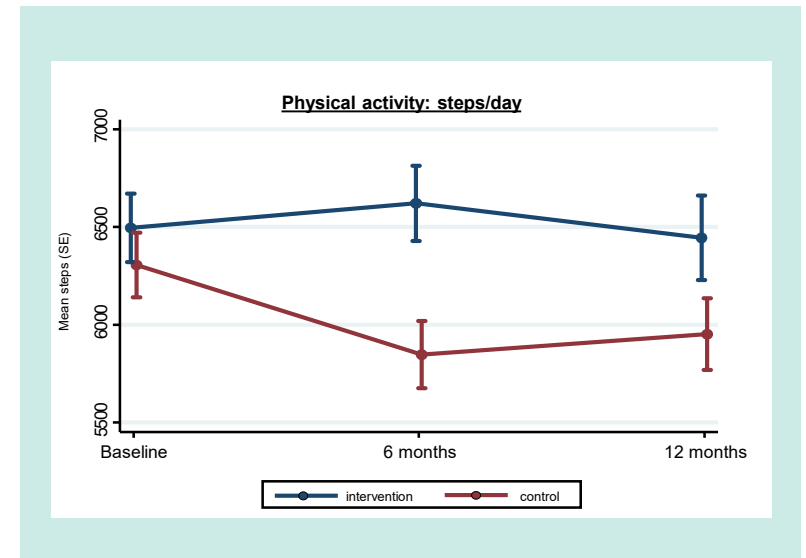
## Effect of a coaching intervention to enhance physical activity and prevent falls in community-dwelling people aged 60+ years: a cluster randomised controlled trial

Juliana S Oliveira , <sup>1,2,3</sup> Catherine Sherrington , <sup>1,2,3</sup> Chris Rissel,<sup>3</sup>  
Kirsten Howard,<sup>3,4</sup> Allison Tong,<sup>3</sup> Dafna Merom,<sup>5</sup> James Wickham,<sup>6</sup> Adrian E Bauman,<sup>7</sup>  
Stephen R Lord,<sup>8</sup> Richard I Lindley,<sup>9</sup> Judy M Simpson,<sup>3</sup> Margaret Allman-Farinelli,<sup>10</sup>  
Catherine Kirkham,<sup>1,2,3</sup> Elisabeth Ramsay,<sup>1,2,3</sup> Sandra O'Rourke,<sup>1,2,3</sup>  
Anne Tiedemann<sup>1,2,3</sup>

N=605, 71 clusters



- **Physical activity** significantly higher in intervention group at 6 months (**MD 649 steps/day**) and 12 months (**MD 460 steps/day**).
- Lower **fall rate** in intervention group (**0.71 falls per person/year**) versus control group (**0.87 falls per person/year**); however not statistically significant (**IRR 0.86, 95% CI 0.6 to 1.1**).
- **Process evaluation** revealed **positive participant impressions** of the intervention.



# Population-based interventions for preventing falls and fall-related injuries in older people

Sharon R Lewis,  Lisa McGarrigle, Michael W Pritchard, Alessandro Bosco, Yang Yang, Ashley Gluchowski, Jana Sremanakova, Elisabeth R Boulton, Matthew Gittins, Anneliese Spinks, Kilian Rapp, Daniel E MacIntyre, Roderick J McClure, Chris Todd [Authors' declarations of interest](#)

Version published: 05 January 2024 [Version history](#)

## Authors' conclusions

Given the very low-certainty evidence, we are unsure whether population-based multicomponent or nutrition and medication interventions are effective at reducing falls and fall-related injuries in older adults. Methodologically robust cluster RCTs with sufficiently large communities and numbers of clusters are needed. Establishing a rate of sampling for population-based studies would help in determining the size of communities to include. Interventions should be described in detail to allow investigation of effectiveness of individual components of multicomponent interventions; using the ProFaNE taxonomy for this would improve consistency between studies.

## SYSTEMATIC REVIEW

# Exercise for falls prevention in aged care: systematic review and trial endpoint meta-analyses

SUZANNE M. DYER<sup>1</sup>, JENNI SUEN<sup>1</sup>, WING S. KWOK<sup>2</sup>, RIK DAWSON<sup>2</sup>, CHARLOTTE MCLENNAN<sup>2</sup>, IAN D. CAMERON<sup>3,4</sup>, KEITH D. HILL<sup>5</sup>, CATHERINE SHERRINGTON<sup>2</sup>

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<sup>2</sup>Institute for Musculoskeletal Health, Sydney Musculoskeletal Health, The University of Sydney and Sydney Local Health District, Sydney, Australia

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<sup>4</sup>Kolling Institute, The University of Sydney, St Leonards, New South Wales, Australia

<sup>5</sup>Rehabilitation, Ageing and Independent Living (RAIL) Research Centre, School of Primary and Allied Health Care, Peninsula Campus, Monash University, Frankston, Australia

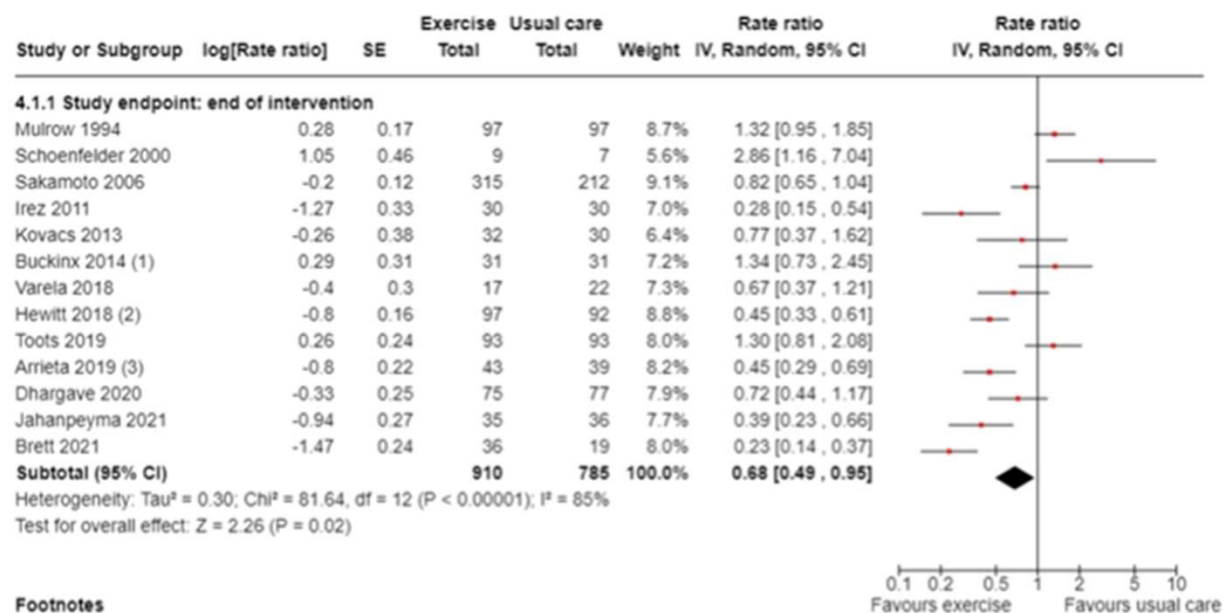
Address correspondence to: Suzanne M. Dyer, Flinders Medical Centre (Rehab, FMC 4W330), Bedford Park, SA 5042, GPO Box 2100, Adelaide 5001, South Australia. Tel: (+61) 8 72218336. Email: [sue.dyer@flinders.edu.au](mailto:sue.dyer@flinders.edu.au)





## Exercise for falls prevention in aged care

### (a) Rate ratio for falls at the end of the intervention period



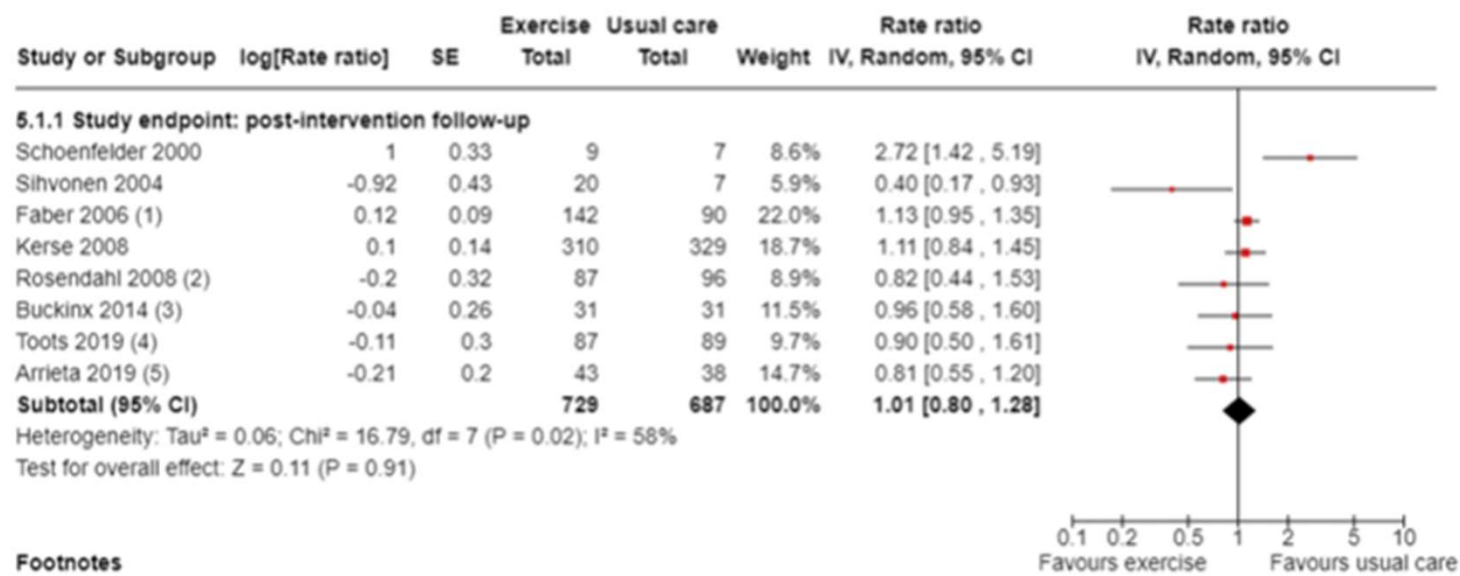
#### Footnotes

(1) 6 months (end intervention)

(2) At end intervention plus 6 months post-intervention maintenance period

(3) 6 months

(b) Rate ratio for falls after a period of post-intervention follow-up



**Footnotes**

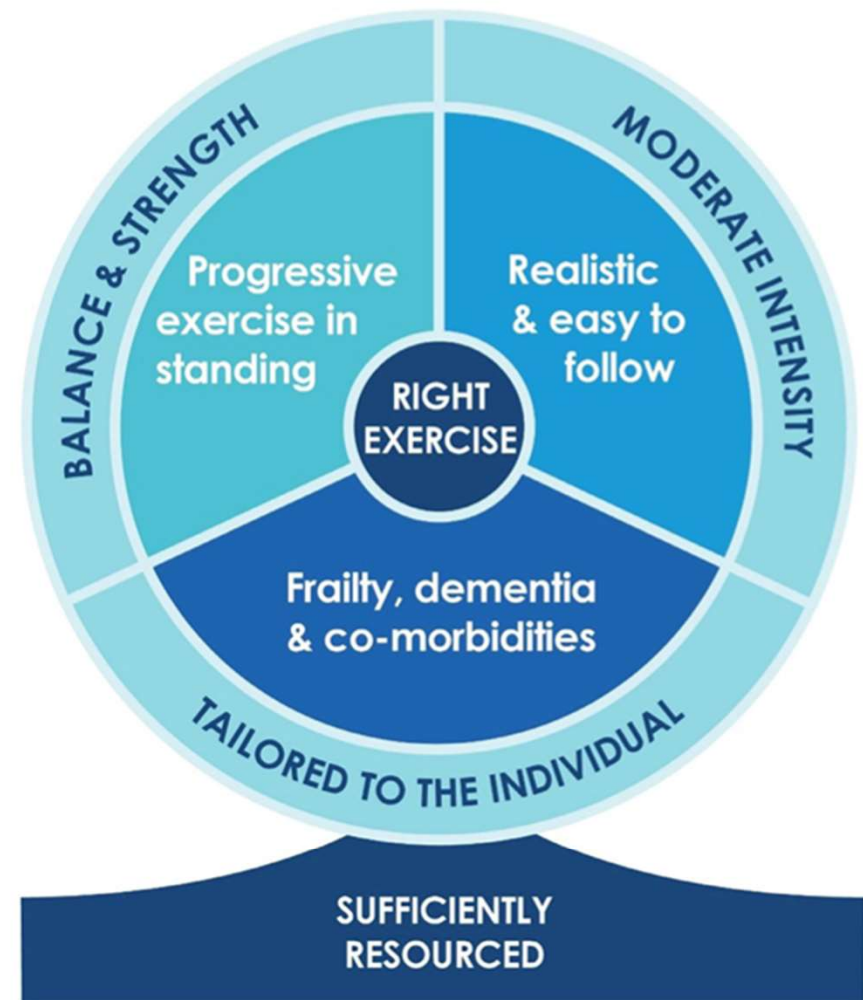
- (1) Functional Walking (FW) and In Balance groups (IB) combined vs control
- (2) Functional exercise programme vs seated activities
- (3) 12 months (6 months post-intervention)
- (4) 16 months (12 months after 4 month intervention)
- (5) 12 months (6 months after 6 month intervention)

Original research



# Effective fall prevention exercise in residential aged care: an intervention component analysis from an updated systematic review


Rik Dawson <sup>1,2</sup>, Jenni Suen, <sup>3</sup> Catherine Sherrington <sup>1,2</sup>, Wing Kwok <sup>1,2</sup>, Marina B Pinheiro <sup>1,2</sup>, Abby Haynes, <sup>1,2</sup> Charlotte McLennan, <sup>1,2</sup> Katy Sutcliffe, <sup>4</sup> Dylan Kneale, <sup>4</sup> Suzanne Dyer <sup>3</sup>

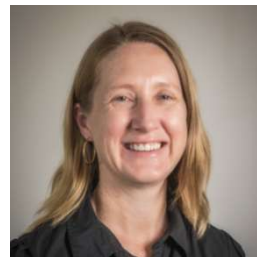
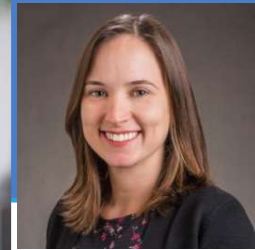


**Figure 2** ICA theory of effective fall prevention exercise in residential aged care. ICA, intervention component analysis.

Original research

# Physiotherapy-led telehealth and exercise intervention to improve mobility in older people receiving aged care services (TOP UP): protocol for a randomised controlled type 1 hybrid effectiveness-implementation trial

Rik Dawson <sup>1,2</sup> Marina Pinheiro,<sup>1,2</sup> Vasikaran Nagathan,<sup>3,4</sup> Morag Taylor,<sup>5,6</sup> Kim Delbaere,<sup>5,6</sup> Juliana Olivera,<sup>1,2</sup> Abby Haynes,<sup>1,2</sup> Jenny Rayner,<sup>2</sup> Leanne Hassett,<sup>1,2</sup> Catherine Sherrington<sup>1,2</sup>



# TOP UP key intervention components



10 Physio telehealth sessions over 6 months over Zoom



2 hours of exercise per week supported by online exercise

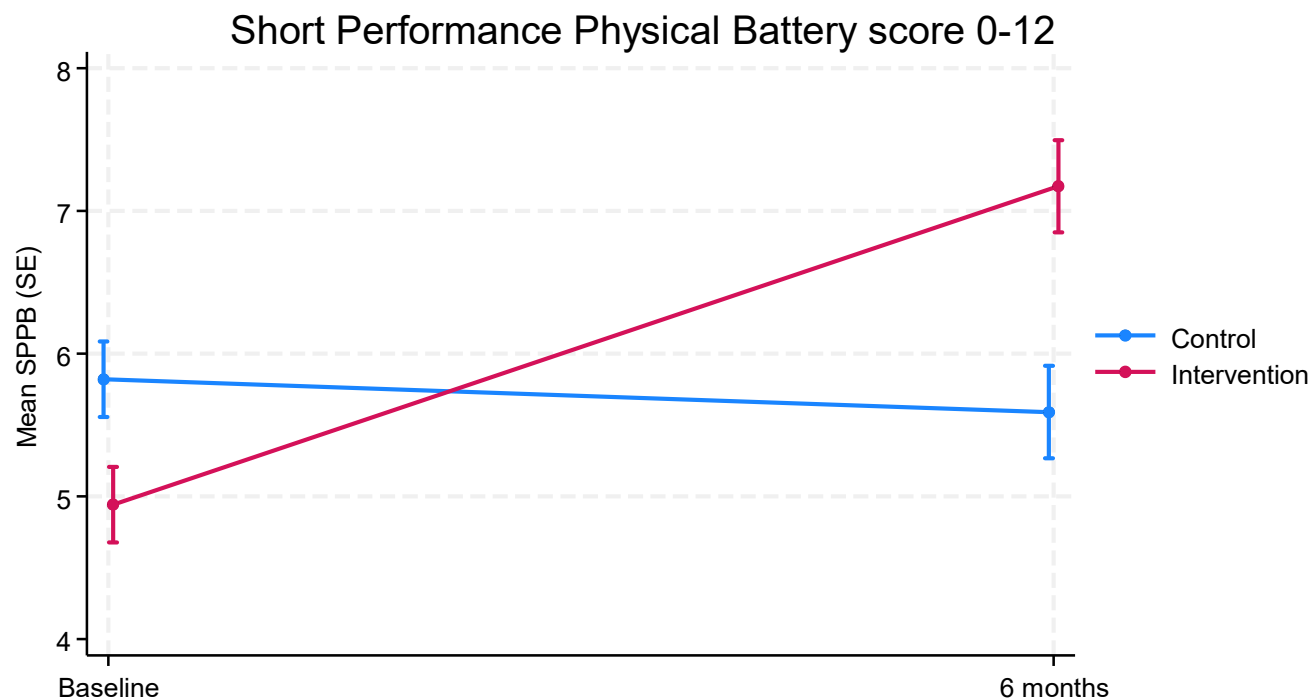


Progressive, tailored balance and strength moderate-intensity exercise (Otago and Sunbeam informed)



Care staff (coaches) support participants one hour per week

## Primary outcome – mobility



Between group change 2.1 points (95% CI 1.4 to 2.7)





## CLINICAL TRIAL

# A stepped-wedge randomised controlled trial to assess efficacy and cost-effectiveness of a care-bundle to prevent falls in older hospitalised patients

GIANFRANCO DI GENNARO<sup>1,†</sup>, LILIYA CHAMITAVA<sup>2,†</sup>, PAOLO PERTILE<sup>3</sup>, ELISA AMBROSI<sup>2</sup>, DANIELA MOSCI<sup>4</sup>, ALICE FILA<sup>2</sup>, MULUBIRHAN ASSEFA ALEMAYOHU<sup>2</sup>, LUCIA CAZZOLETTI<sup>2</sup>, STEFANO TARDIVO<sup>2</sup>, MARIA ELISABETTA ZANOLIN<sup>2</sup>

<sup>1</sup>Department of Health Sciences, University of Catanzaro "Magna Græcia", Catanzaro, Italy

<sup>2</sup>Department of Diagnostics and Public Health, University of Verona, Verona, Italy

<sup>3</sup>Department of Economics, University of Verona, Verona, Italy

<sup>4</sup>Hospital Hygiene and Prevention, IRCCS Azienda Ospedaliero-Universitaria di Bologna, Bologna, Italy

1. Assessment of patients' risk of falls at hospital admission, as measured with the Conley Scale [11];
2. Use of alert signs on top of bed frames to increase staff awareness of patients at high fall risk;
3. Systematic communication with patients and family members/caregivers regarding fall risk. Promotion of an open-door ward policy with the presence of informal caregivers;
4. Application of universal strategies to ensure environmental safety, such as checking and maintaining the integrity/functioning of night bells and lights, supplemental lighting, keeping floor surfaces clean and dry, etc.;
5. Conduction of rounds every 2 h to assess patients' needs, such as go to the bathroom, change position or drink;
6. Regular re-assessment of the patient's medications, particularly those that may affect the central nervous and cardiovascular system.

## Conclusions

The care-bundle program introduced in this study led to a statistically significant decrease in the risk of falls in patients aged 75 years or older admitted to a hospital unit and it appears to be cost-effective compared to the practices routinely used.



# PROTECT

FALL PREVENTION PROGRAM



- **PROTECT** (Prevention Through Education and Coaching) Program: Supported implementation (via coaching and other tailored strategies) of tailored fall prevention interventions (guided by evidence-informed SLHD Fall Prevention Strategy)



Australian Government  
National Health and  
Medical Research Council



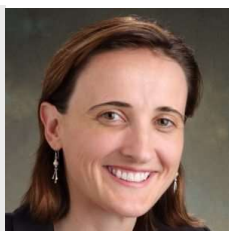
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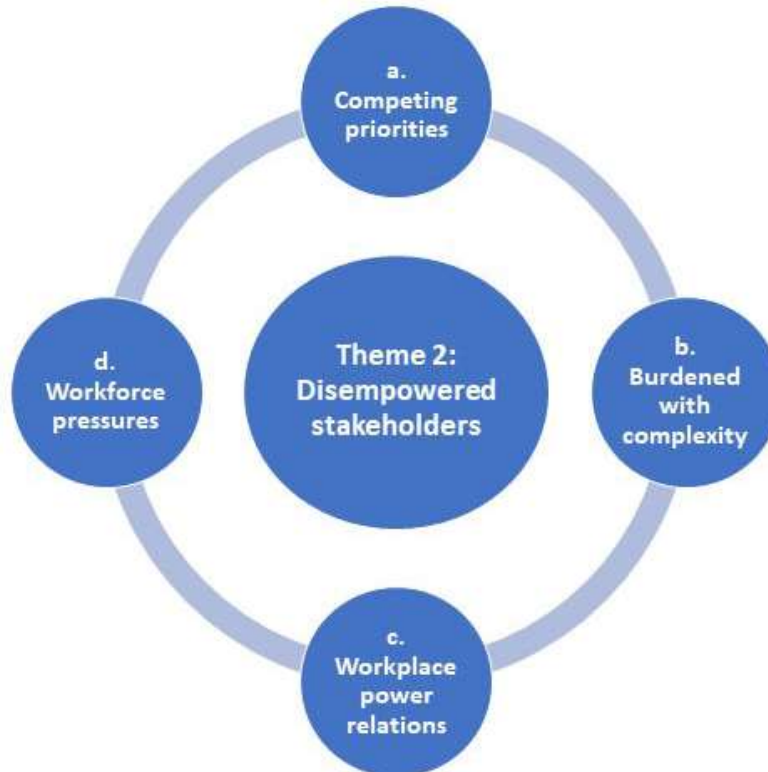


CLINICAL  
EXCELLENCE  
COMMISSION





## Theme 1: Fall prevention is a priority but whose?



**Theme 3: Shared responsibility may be a solution**

**a. Connecting across the care team**

**b. Partnering with patients and families**

Research Article

## The Clinical Effectiveness of a Physiotherapy Delivered Physical and Psychological Group Intervention for Older Adults With Neurogenic Claudication: The BOOST Randomized Controlled Trial

Esther Williamson, PhD,<sup>1,2,\*</sup> Graham Boniface, MRes,<sup>1</sup> Ioana R. Marian, MSc,<sup>3</sup> Susan J. Dutton, MSc,<sup>3</sup> Angela Garrett,<sup>1</sup> Alana Morris, MSc,<sup>1</sup> Zara Hansen, PhD,<sup>1</sup> Lesley Ward, PhD,<sup>4</sup> Philippa J.A. Nicolson, PhD,<sup>1</sup> David Rogers, MSc,<sup>5</sup> Karen L. Barker, PhD,<sup>1,6</sup> Jeremy C. Fairbank, MD, FRCS,<sup>1</sup> Judith Fitch,<sup>7</sup> David P. French, PhD,<sup>8</sup> Christine Comer, PhD,<sup>9,10</sup> Christian D. Mallen, PhD,<sup>11</sup> and Sarah E. Lamb, DPhil<sup>2</sup>; on behalf of the BOOST Research Group

- physical and psychological group intervention (BOOST program) compared to physiotherapy assessment and tailored advice
- at 12 months, the BOOST program resulted in greater improvements in walking capacity (6MWT MD: 21.7m [95% CI 5.96, 37.38]) and ODI walking item (MD: -0.2 [95% CI -0.45, -0.01]) and reduced falls risk (odds ratio: 0.6 [95% CI 0.40, 0.98]) compared to control



RCT, 438 participants

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## **Jump to**

**Abstract**

**Prevalence of Falls**

## **Preventing and Managing Falls in Adults With Cardiovascular Disease: A Scientific Statement From the American Heart Association**

Quin E. Denfeld, Stephanie Turrise, Eric J. MacLaughlin, Pei-Shiun Chang, Walter K. Clair, Eldrin F. Lewis, Daniel E. Forman, Sarah J. Goodlin and on behalf of the American Heart Association Cardiovascular Disease in Older Populations Committee of the Council on Clinical Cardiology and Council on Cardiovascular and Stroke Nursing; Council on Lifestyle and Cardiometabolic Health; and Stroke Council

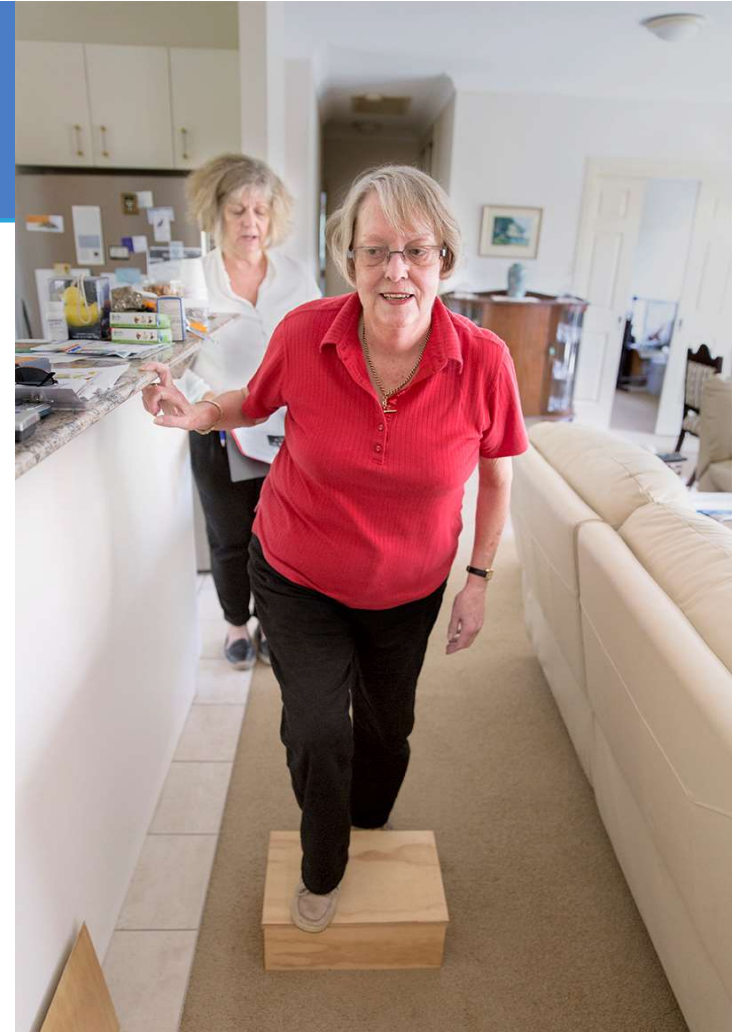
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**Originally published** 19 May 2022 | <https://doi.org/10.1161/HCQ.000000000000108> |  
Circulation: Cardiovascular Quality and Outcomes. 2022;15



# Outline

- Data update
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## Consolidated Framework for Implementation Research (CFIR) 2.0

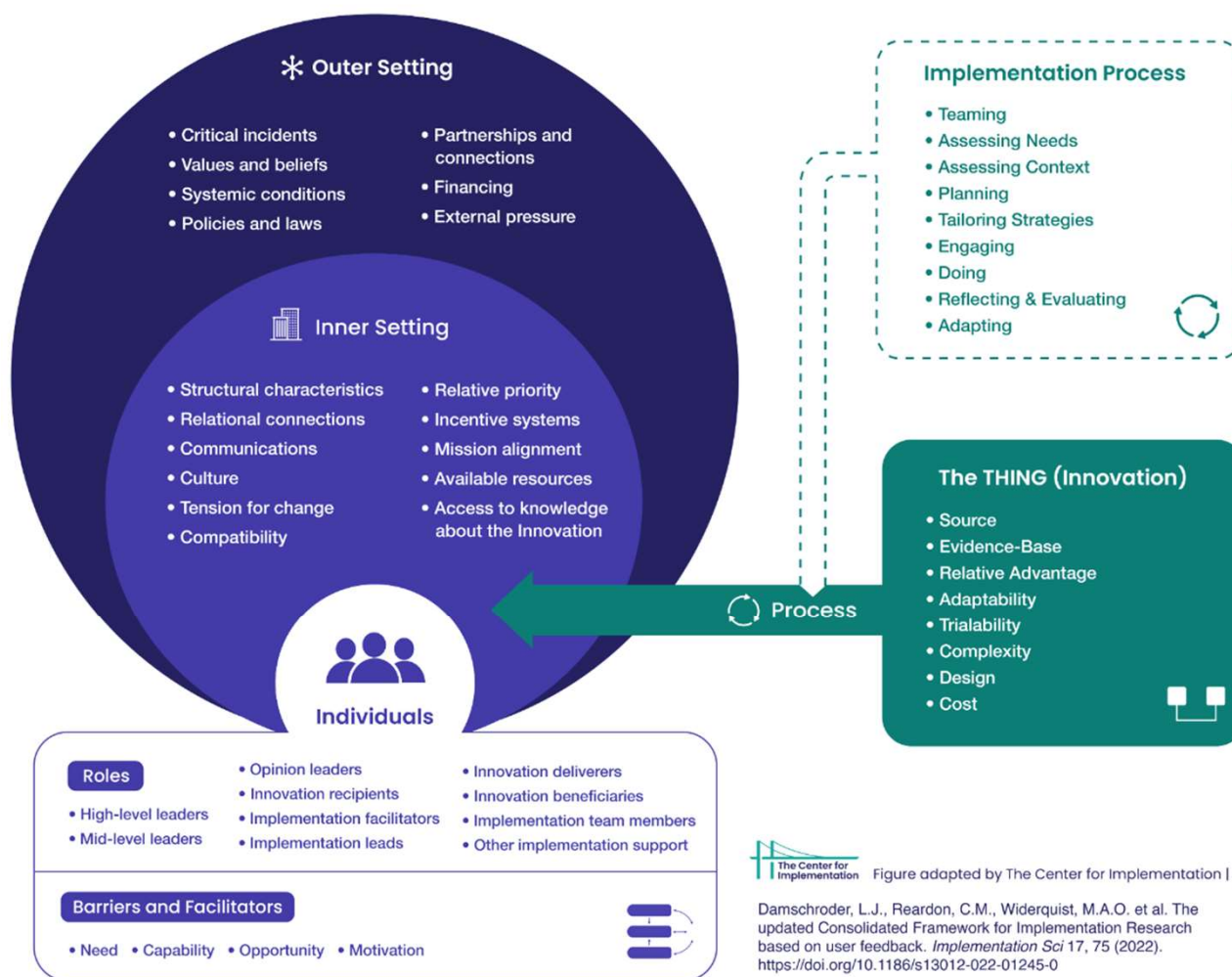


Figure adapted by The Center for Implementation | V2024.01


Damschroder, L.J., Reardon, C.M., Widerquist, M.A.O. et al. The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Sci* 17, 75 (2022). <https://doi.org/10.1186/s13012-022-01245-0>

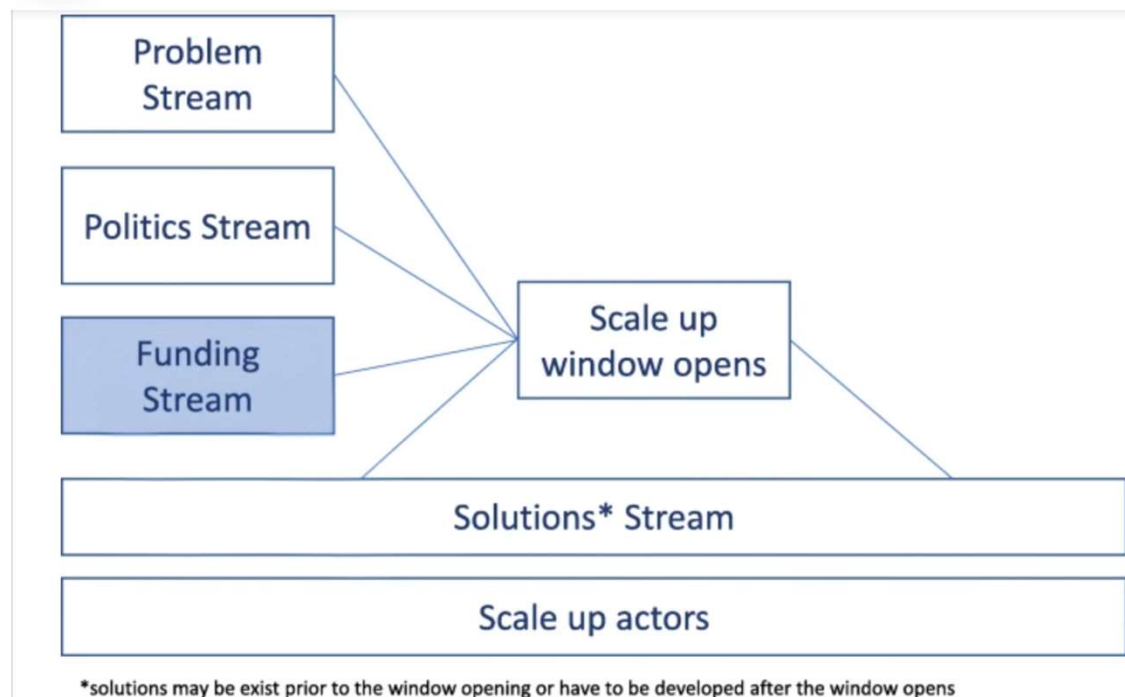
RESEARCH

Open Access

# Scaling up population health interventions from decision to sustainability – a window of opportunity? A qualitative view from policy-makers



Karen Lee<sup>1,2\*</sup> , Femke van Nassau<sup>3</sup>, Anne Grunseit<sup>1,2</sup>, Kathleen Conte<sup>2,4</sup>, Andrew Milat<sup>5</sup>, Luke Wolfenden<sup>2,6</sup> and Adrian Bauman<sup>1,2</sup>



The 'scale-up window' - Adapted from Kingdon's Multiple Streams Theory

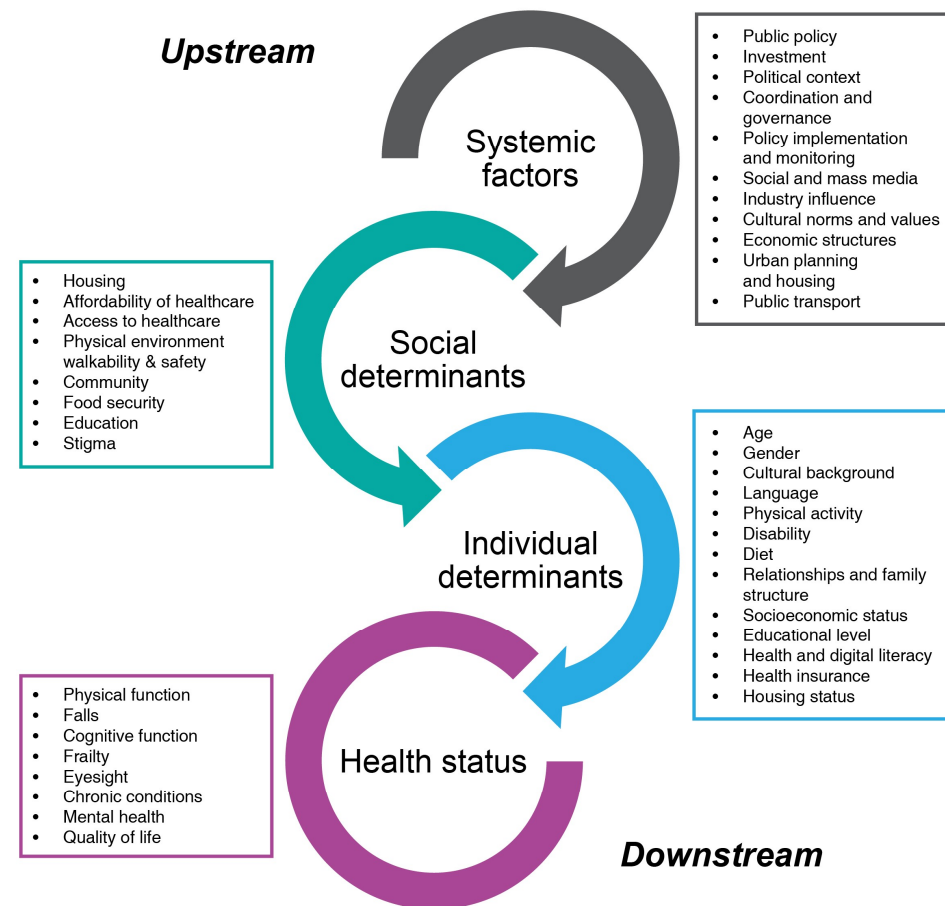


Research

# A systems approach to assist policy action to prevent falls among community-dwelling older people in Australia

Nathalia Costa, Meghan Ambrens, Kim Delbaere, Louise Wilson, Ang Li, Catherine Sherrington

Published 4 April 2024. <https://doi.org/10.17061/phrp3412405>





## Fall Prevention in NSW

White Paper 2023







Among people aged 65+ years		2021	2041*
Fall-related injury hospitalisations		41,600	60,300
Total annual bed days		395,200	543,400
Direct health care costs		\$752 million <sup>#</sup>	\$1.09 billion
Deaths		1,216 <sup>^</sup>	1,764

Figure 5: Projections at a glance: the burden of fall-related injury in NSW

# Australian Fall Prevention Guidelines October 2024



**NeuRA**  
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**Falls Prevention Society**



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**US Preventive Services Task Force** | Recommendation  
Statement

ONLINE FIRST

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June 4, 2024

# Interventions to Prevent Falls in Community-Dwelling Older Adults

## US Preventive Services Task Force Recommendation Statement



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Population	Recommendation	Grade
Community-dwelling adults 65 years or older	The USPSTF recommends exercise interventions to prevent falls in community-dwelling adults 65 years or older who are at increased risk for falls.	B
Community-dwelling adults 65 years or older	The USPSTF recommends that clinicians individualize the decision to offer multifactorial interventions to prevent falls to community-dwelling adults 65 years or older who are at increased risk for falls. Existing evidence indicates that the overall net benefit of routinely offering multifactorial interventions to prevent falls is small. When determining whether this service is appropriate for an individual, patients and clinicians should consider the balance of benefits and harms based on the circumstances of prior falls, presence of comorbid medical conditions, and the patient's values and preferences.	C

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See the Practice Considerations section for information on risk assessment for falls. USPSTF indicates US Preventive Services Task Force.





Decreasing activity



**1 Very fit** – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.



**2 Well** – People who have no active disease symptoms but are less fit than people in category 1. Often they exercise or are very active occasionally, eg seasonally.



**3 Managing well** – People whose medical problems are well controlled, but are not regularly active beyond routine walking.



**4 Vulnerable** – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being "slowed up" and/or being tired during the day.



**5 Mildly frail** – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

Increasing dependency



**6 Moderately frail** – People need help with all outside activities and with keeping house. Inside they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.



**7 Severely frail** – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~6 months).



**8 Very severely frail** – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness



**9 Terminally ill** – Approaching the end of life. This category applies to people with a life expectancy of <6 months, who are not otherwise evidently frail.

#### Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal. In **moderate dementia**, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting. In **severe dementia**, they cannot do personal care without help.





# Age and Ageing

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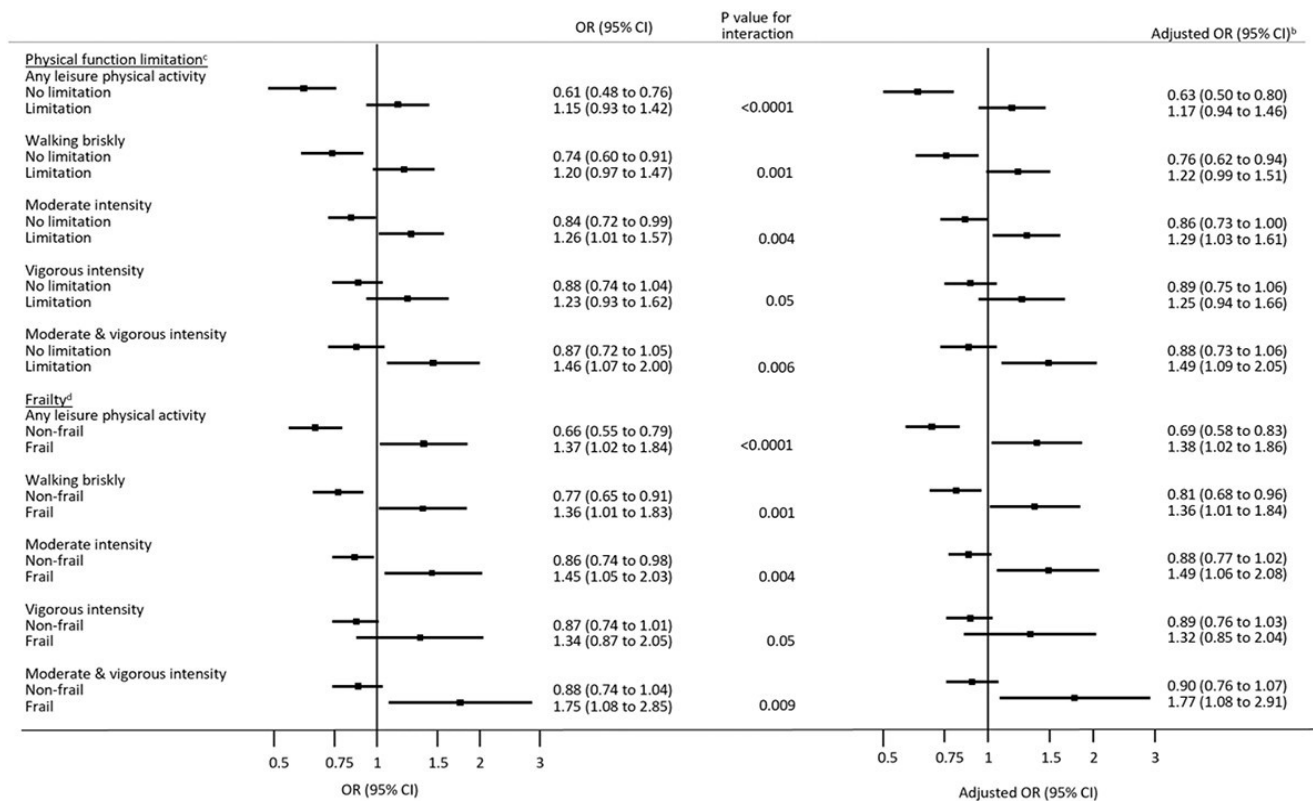
**Article Contents**

## JOURNAL ARTICLE

### **Physical activity and injurious falls in older Australian women: adjusted associations and modification by physical function limitation and frailty in the Australian Longitudinal Study on Women's Health**

Wing S Kwok , Xenia Dolja-Gore, Saman Khalatbari-Soltani, Julie Byles, Juliana S Oliveira, Marina B Pinheiro, Vasi Naganathan, Anne Tiedemann, Catherine Sherrington

**Figure 2** Effect modifications of physical function limitation and frailty on cross-sectional results



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## Community based complex interventions to sustain independence in older people: systematic review and network meta-analysis

Thomas F Crocker,<sup>1</sup> Joie Ensor,<sup>2,3</sup> Natalie Lam,<sup>1</sup> Magda Jordão,<sup>1</sup> Ram Bajpai,<sup>3</sup> Matthew Bond,<sup>3</sup> Anne Forster,<sup>1</sup> Richard D Riley,<sup>2,3</sup> Deirdre Andre,<sup>4</sup> Caroline Brundle,<sup>1</sup> Alison Ellwood,<sup>1</sup> John Green,<sup>1</sup> Matthew Hale,<sup>1</sup> Lubena Mirza,<sup>1</sup> Jessica Morgan,<sup>5</sup> Ismail Patel,<sup>1</sup> Eleftheria Patetsini,<sup>1</sup> Matthew Prescott,<sup>1</sup> Ridha Ramiz,<sup>1</sup> Oliver Todd,<sup>1</sup> Rebecca Walford,<sup>5</sup> John Gladman,<sup>6,7</sup> Andrew Clegg<sup>1</sup>

129 studies (74 946 participants)

“The intervention most likely to sustain independence is individualised care planning including medicines optimisation and regular follow-up reviews resulting in multifactorial action. Homecare recipients may particularly benefit from this intervention.”

# Summary

- Data update: falls are still a big problem in Australia
- Evidence update
  - Community: Stepping exergame prevents falls, phone coaching from a physio can enhance physical activity without increasing falls
  - Residential care: Need to keep exercising, telehealth physio can help
  - Hospital: promising intervention package, staff support seems important
  - Clinical populations: exercise and psychological group prevented falls in people with spinal canal stenosis
- Implementation update
  - Updated CFIR might help
  - US guidelines released, Australian on way
  - No national policy in falls, complex drivers of falls
  - Engaging with other perspectives might help advocacy



# STAY ON YOUR FEET

Move Improve Remove

<https://www.injurymatters.org.au/programs/stay-on-your-feet/move-improve-remove-campaigns/>