

Avoidable drivers of falls among older people: The impact of housing quality and characteristics



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2. This work uses data from the English Longitudinal Study of Ageing (ELSA).
Banks, J., Batty, G. David, Breedvelt, J., Coughlin, K., Crawford, R., Marmot, M., Nazroo, J., Oldfield, Z., Steel, N., Steptoe, A., Wood, M., Zaninotto, P. (2025). English Longitudinal Study of Ageing: Waves 0-11, 1998-2024. 47th Edition. UK Data Service. SN: 5050, DOI: <http://doi.org/10.5255/UKDA-SN-5050-34>

Background



In England, 1/3 of those aged 65+, and half of those aged 80+, experience at least one fall annually.



Falls often result in fractures, lacerations, and other injuries.



Falls can also have important long-term negative impacts on independence and wellbeing.



As a result, falls increase demand for both health and care services.

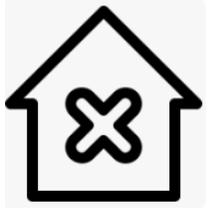
Motivation → Evidence gap

- Increased risk of falls linked to age, gender, biomarkers, frailty status, and health (eFalls calculator & STRATIFY-Falls).
- For those at risk: Vitamin D supplements, External housing modifications (widened doorways, ramps, automatic doors), Digital technologies, Exercise programmes, and Multifactorial interventions (incl. hazards identification).

- Review of cost-effective interventions (PHE, 2018): 26 studies, four of them involved home assessment and modifications, but no evidence on impact of housing quality.

- Cost of falls to health and care in older adults has been estimated in Scotland, but not in England.

Study aims



- RQ1: What is the impact of housing problems on falls, controlling for other risk factors?
 - Causality vs. association



- RQ2: What is the impact of housing-related falls on care patterns and associated costs?
 - Health and care costs.



- RQ3: What are the effects of home adaptations on health/care costs?

Data

- ELSA waves 1-10
2002/03 to 2021/23

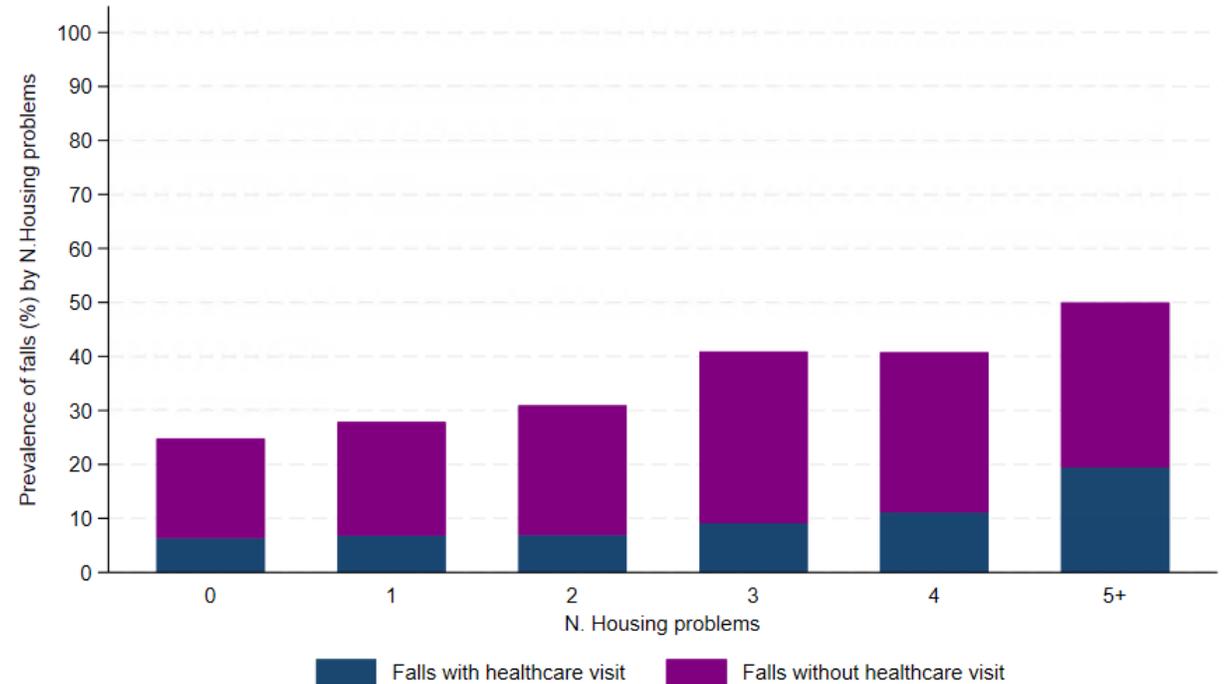
- Age: 65+.

- ~30% OP have a fall.

- Housing problems:

*Damp, decay, space, plumbing issues,
too cold, too dark, noise, etc.*

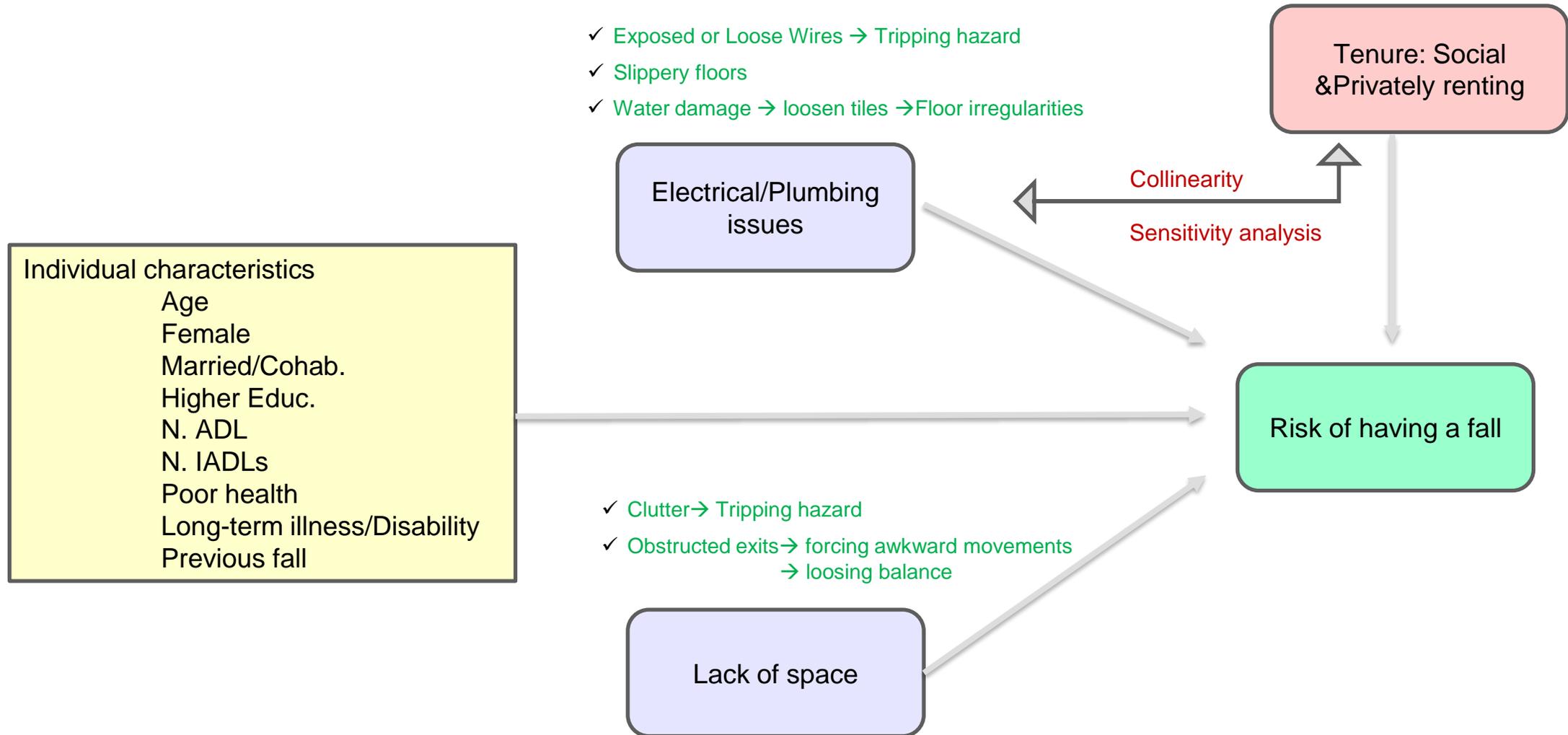
- ~24% (overall) & ~ 29% (with a fall) have a housing problem.



RQ1: What is the impact of housing problems on falls, controlling for other risk factors?

Instruments: Smoker & Number of waves.

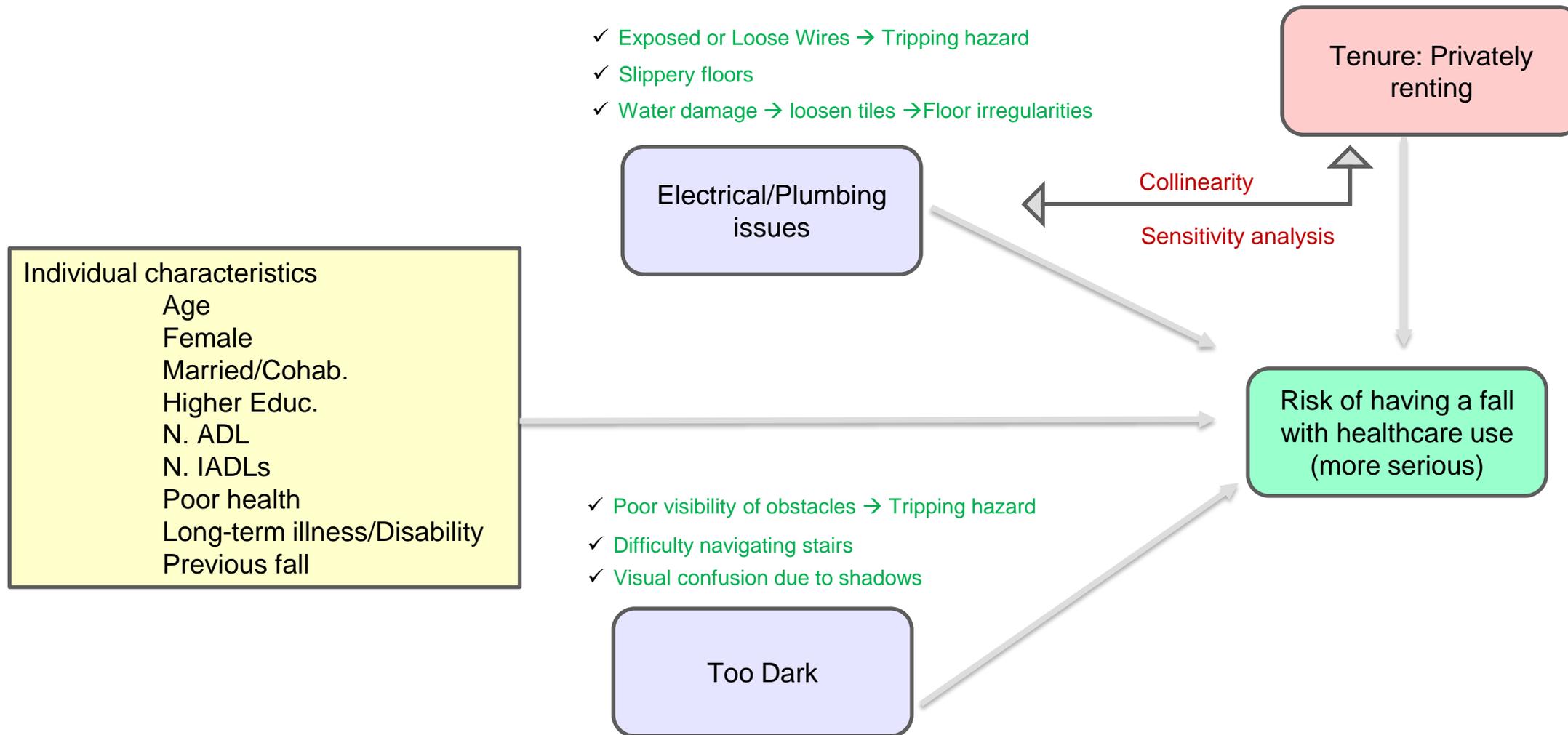
- ✓ Exposed or Loose Wires → Tripping hazard
- ✓ Slippery floors
- ✓ Water damage → loosen tiles → Floor irregularities



We also tested: Damp, Condensation, too Cold, too dark, general decay, and total number of housing problems.

Instruments: Smoker & Number of waves.

- ✓ Exposed or Loose Wires → Tripping hazard
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- ✓ Water damage → loosen tiles → Floor irregularities



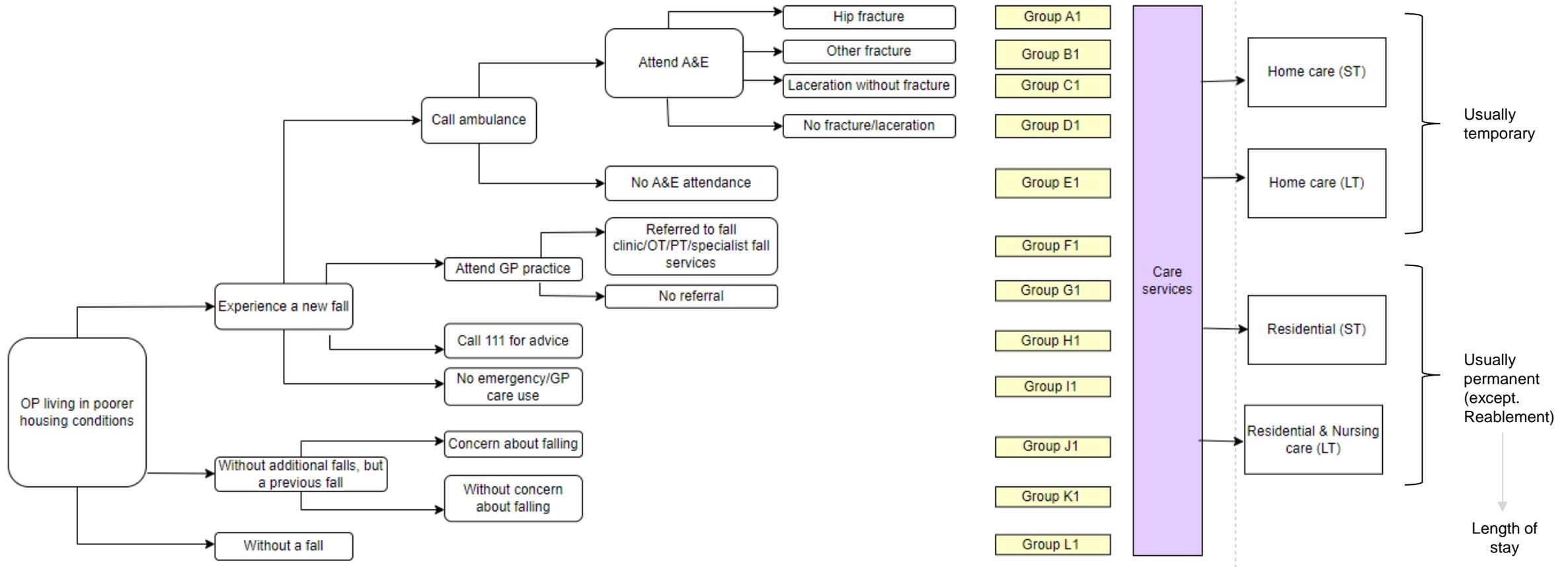
We also tested: Damp, Condensation, too Cold, lack of space, general rot/decay, and total number of housing problems.

RQ2: What is the impact of housing-related falls on care patterns and associated costs?

Decision tree model

- Visual representation of pathways → 
- Each “branch” represents a mutually exclusive decision or event and indicates what could happen next.
- By following the branches, we can compare different options, their chances of happening, and their possible outcomes → 1 year.
- Parameters/Assumptions: Data (ELSA) & Previous evidence.

Falls pathways (formal care): Home care, RC (ST), and RC (LT)



Cost estimation: 1 year (2023 prices)

Added cost of falls (OP living in poor housing conditions)	Cost estimation (£)	Average added cost per OP living in poor housing conditions (who had a fall)
Health care	£540 million (35%)	£449
Formal care	£991 million (65%)	£824
Total (Health and Social care)	£1.5 billion (100%)	£1,273

Note: The estimations represent the additional cost of falls attributable to living in poor housing.

RQ3: What are the effects of home adaptations on health and care costs?

- Health care cost of falls due to poor housing conditions (with home adaptations):
£405 million (25% ↓)
- Care cost of falls due to poor housing conditions (with home adaptations):
£769 million (22% ↓)
- Total cost of falls due to housing conditions (with home adaptations):
£1.2 billion (23% ↓)

Limitations

- ELSA: Self-reported falls (stigma, memory, self worth).
- Decision tree model is a simplification of actual pathways & relies on previous evidence.
- MH services are not included → PLE group.
- Total effect likely to extend beyond one year.
- We assume the consequences of falls do not vary depending on whether they relate to poor housing.
→ underestimation of costs?

Discussion

- Poor housing conditions significantly increase the risk of falls.
- Simple/unexpensive solutions!
- Some of the improvements needed to prevent housing related falls also likely to improve individuals' capacity to perform their daily activities and reduce care demand.
- Currently, the costs of these falls are substantial, with care making up the largest share of the burden → Better housing could reduce reliance on high-cost care.
- Improving housing quality for older adults should be seen as a key falls prevention strategy, alongside clinical and behavioural interventions.



Thank you!

We welcome any questions or comments



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Appendix

Cost estimation: 1 year (triangulation)

1. Cost of falls (with and without housing problems): Health and SC (Scottish data)	<u>Cost estimation</u> (England)	→ <u>Triangulation</u> (Craig et al., 2013): Adjusting by population size and inflation.
Health care	£2.0 billion (35%)	 £2.4 billion (40%)
Social care	£3.7 billion (65%)	 £3.5 billion (60%)
Total	£5.8 billion (100%)	 £5.9 billion (100%)
2. Cost of falls (with and without housing problems): Health (English data)	<u>Cost estimation</u> (England)	→ <u>Triangulation</u> (Age UK, 2010): Adjusting by inflation.
Health care	£2.0 billion	 £1.7 billion

Main differences...

Assumptions/Data	Craig et al. (2013): Scottish data	ESHCRU (This project)
Data source	<ul style="list-style-type: none"> • Administrative data • Literature search 	<ul style="list-style-type: none"> • Survey data • Literature search
Health care services	GP, A&E, ambulance, hospital	GP, A&E, ambulance, NHS 111, hospital, OT ✓
Social care services	<ul style="list-style-type: none"> • Home care • Short-term care home • Long-term care home 	<ul style="list-style-type: none"> • Home care • Short-term care home • Long-term care home
Length of Stay in (Residential care)	Median length of stay	Distributional effects (survival curves) ✓