

<b>Institution:</b> University of Nottingham		
<b>Unit of Assessment:</b> 3 - Allied Health Professions, Dentistry, Nursing and Pharmacy		
<b>Title of case study:</b> Preventing, Reducing and Managing Falls in Adults		
<b>Period when the underpinning research was undertaken:</b> 2004 – 2020		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Professor Pip Logan	Professor of Rehabilitation Research and Occupational Therapist	1996 – present
Professor Rowan Harwood	Professor of Palliative and End-of-Life Care and Honorary Consultant Geriatrician	1995 – 1996 and 2018 – present
Dr Sarah Goldberg	Associate Professor in Older Persons Care	2009 – present
Dr Vicky Booth	Associate Professor of Rehabilitation, and Physiotherapist	2019 – present
Kate Robertson	Clinical Expert for Older People's Research	2017 – 2020
<b>Period when the claimed impact occurred:</b> August 2013 to December 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> No		
<b>1. Summary of the impact</b>		
<p>Research by the University of Nottingham has transformed the care of older adults living in the community by developing and implementing novel interventions that mitigate the risk of falling in three linked areas:</p> <p><b>New intervention for the ambulance service:</b> Our research led to the first-of-its-kind clinical pathway, the “falls ambulance” in Nottingham. Subsequently 8 of the remaining 12 ambulance trusts in the UK developed falls referral pathways, with a one year reduction in hospital admissions of over 550 patients and cost savings of GBP197,500 for just one ambulance trust.</p> <p><b>Physical activity intervention:</b> Research investigating the implementation of a NICE endorsed strength and balance training programme in the ‘real world’ setting led to the commissioning of the programme.</p> <p><b>Falls in care homes:</b> Development and implementation of a new clinically effective and cost-effective falls intervention (the GtACH tool) in care homes resulted in a change to patient care practices, mitigation of potential harm and improved patient outcomes (a decrease of 43% in falls).</p>		
<b>2. Underpinning research</b>		
<p>30% of people aged over 65, 50% aged over 80, and between 60% and 80% of people with dementia unintentionally fall each year, which can result in injury, hospital admission, and death (NHS England). Reducing falls poses an urgent challenge worldwide. Our research since 2004 has established us as an internationally renowned multidisciplinary team, expert at developing and evaluating interventions that have reduced falls. Our research impacts falls management and care in three linked areas, as detailed below:</p> <p><b>Ambulance services</b></p> <p>A randomised controlled trial (RCT) between 2005 and 2008 (n=204) led by Logan evaluated a specialist support intervention for people who had fallen and called an ambulance but had not been transported to hospital (R1). This unique study showed the intervention (referral from the ambulance service into the community Falls Prevention Service) was highly effective, reducing the rate of falls over the subsequent year by 55% (incidence rate ratio,</p>		

adjusted for primary care trust, was 0.45 (95% confidence interval 0.35 to 0.57,  $p < 0.001$ ). Our economic evaluation demonstrated high cost-effectiveness with the mean difference in NHS and Social Care costs between the intervention and control groups of GBP-1,551 per patient over one year. The mean difference in Quality Adjusted Life Years (QALYs) was 0.07 (95% CI: -0.01 to 0.15) in favour of the intervention group (R2).

### Physical activity

Between 2015 and 2018 Logan and colleagues at the University of Nottingham with East Midlands NHS and Local Government investigated the implementation of the evidence based Falls Management Exercise (FaME) programme in a range of settings through the 'PHysical activity Implementation Study In Community-dwelling AduLts' (PHISICAL) study (R3). 361 people took part in 29 FaME programmes. 41% of participants completed at least three-quarters of the classes and significant improvements were seen in mobility, measured with Timed Up and Go and the Falls Efficacy Scale (both  $p < 0.001$ ), and muscle strength and balance increased by 55%. These results confirmed the benefits of the FaME programme in real-world settings (R3).

The 'Promoting Activity, Independence and Stability in Early Dementia and mild cognitive impairment' (PrAISED) study (2016-2022) is a six-year research programme developing and testing interventions to maintain health and independence to reduce falls rates. Logan and Booth co-created the PrAISED intervention using 15 information sources, including focus groups with people with dementia and clinicians (R4). 361 randomised participants (60-feasibility study, 301 RCT) have participated in evaluating the intervention. The intervention development study (2015-2018) (R4), together with the feasibility study (2016-2017) (R5), found the intervention was safe, acceptable and addressed this population's needs. Following completion of the PrAISED intervention it became apparent that most exercise classes were not suitable for people with dementia. To address this, Logan and Booth established a dementia-specific exercise class based on PrAISED principles. Research found that class members demonstrated improvements in balance, levels of physical activity, continuation or return to previous activities and socialisation (2018) (R6).

### Care Homes

Care home residents fall 3 times more often than other community dwelling peers. Logan developed a Guide to Action Care Home falls prevention intervention (GtACH) to assess risk and to provide evidence-based actions for residents, care home staff and visitors to take. The GtACH was trialled in a feasibility study (2011-2014) (R7) and evaluated in the Falls in Care Home study (FinCH); the largest UK care home RCT (2016-2019) (R8). It involved 1,657 residents and 1,051 GtACH-trained staff from 84 care homes across England and Wales. The primary outcome result showed an unadjusted Incidence Rate Ratio (IRR) of 0.57 (95% CI 0.45-0.71,  $p < 0.01$ ) in favour of the GtACH programme (43% reduction in falls). This translates to a falls rate per participant per year of 2.2 for the GtACH intervention group compared to 3.8 for the control group. The incremental cost per EQ-5D based QALY was GBP4,544 and cost per fall averted was GBP191, indicating it was cost effective. The results of the trial have been submitted as an NIHR HTA report which has been peer reviewed and revisions have been submitted. The publication has been delayed due to the COVID-19 pandemic.

### 3. References to the research

Researchers in **bold** are those working at the University of Nottingham at the time of publication.

#### Ambulance services

R1. **Logan PA, Coupland CAC, Gladman JRF, et al.** Community falls prevention for people who call an emergency ambulance after a fall: randomised controlled trial. *British Medical Journal*. 2010; 340: c2102. doi: [10.1136/bmj.c2102](https://doi.org/10.1136/bmj.c2102)

R2. Sach T, **Logan PA, Coupland CAC, Gladman JRF**, Sahota O, Stoner-Hobbs, V, Robertson K, Tomlinson V, Ward M & **Avery AJ**. Community falls prevention for people who

call an emergency ambulance after a fall: an economic evaluation alongside a randomised controlled trial. *Age and Ageing*. 2012; 41(5): 635 -641 [doi.org/10.1093/ageing/afs071](https://doi.org/10.1093/ageing/afs071)

### Physical Activity

R3. **Orton E**, Audsley S, **Coupland C**, **Gladman JRF**, Iliffe S, Lafond N, **Logan P**, Masud T, Skelton DA, Timblin C, Timmons S, Derek W, **Kendrick D** 'Real world' effectiveness of the Falls Management Exercise (FaME) programme: an implementation study. *Age and Ageing*. 2021; <https://doi.org/10.1093/ageing/afaa288>

Publication delayed due to Covid.

R4. **Booth V**, **Harwood RH**, **Hood-Moore V**, **Bramley T**, **Hancox JE**, **Robertson K**, **Halls J**, **Van Der Wardt V**, **Logan PA**. Promoting activity, independence and stability in early dementia and mild cognitive impairment (PrAISED): development of an intervention for people with mild cognitive impairment and dementia. *Clinical Rehabilitation*. 2018; 32(7): 55-864. doi:[10.1177/0269215518758149](https://doi.org/10.1177/0269215518758149)

R5. **Goldberg SE**, **van der Wardt V**, Brand A, **Burgon C**, **Bajwa R**, Hoare Z, **Logan PA**, **Harwood RH** and on behalf of the PrAISED Study Group. Promoting activity, Independence and stability in early dementia (PrAISED): a multisite, randomised controlled, feasibility trial. *BMC Geriatrics*. 2019; 19(353). <https://doi.org/10.1186/s12877-019-1379-5>.

R6. **Long A**, **Di Lorito C**, **Logan PA**, **Booth V**, **Howe L**, **Hood-Moore V**, **van der Wardt V**. The Impact of a Dementia-Friendly Exercise Class on People Living with Dementia: A Mixed-Methods Study. *International Journal of Environmental Research and Public Health*. 2020; 17(12): 4562. [doi.org/10.3390/ijerph17124562](https://doi.org/10.3390/ijerph17124562)

### Care Homes

R7. **Walker GM**, **Armstrong S**, **Gordon AL**, **Gladman JFR**, Robertson K, Ward M, Conroy S, **Arnold G**, **Darby J**, **Frowd N**, Williams W, Knowles S, **Logan PA**. The Falls In Care Home study: A feasibility randomized controlled trial of the use of a risk assessment and decision support tool to prevent falls in care homes. *Clinical Rehabilitation*. 2015; 30(10): 972-983. [10.1177/0269215515604672](https://doi.org/10.1177/0269215515604672)

R8. **Logan PA**, **Horne JC**, Allen F et al. Falls Prevention Programme in Care Homes for Older People: A Multi-Centre, Single Blinded, Cluster Randomised Controlled Trial (FINCH). *NIHR Health Technology Assessment*. 2021. Available on request, publication delayed due to Covid.

### GRANTS, AWARDS AND PRIZES FOR OUR FALLS RESEARCH:

- a) Professor Logan holds a NIHR Senior Investigators Award for her rehabilitation research, including her work on falls prevention. Other awards include:
- b) NIHR Post-doctoral Fellowship GBP250,000 Community falls prevention for people who call an emergency ambulance after a fall 2005-2008 **Logan (ChI)**
- c) NIHR CLAHRC EM GBP278,000, Physical activity implementation study in community dwelling adults 2015-18 **Orton (ChI)**, **Logan (co-investigator)** and GBP30,000 Leicestershire County Council
- d) NIHR PGfAR GBP2,746,451 Promoting Activity, Stability and Independence in Early Dementia (PrAISED) 2016-2022 **Harwood (ChI)**, **Goldberg**, **Logan (co-investigators)**
- e) Alzheimer's Society Clinical Training Fellowship GBP150,408 The influence of mild cognitive impairment on falls, gait and rehabilitation 2014-2018 **Booth (ChI)**, **Logan (supervisor)**
- f) NIHR RfPB GBP143,322 A feasibility study on falls prevention intervention in care homes 2014-2016 **Logan (ChI)**, **Robertson (co-investigator)**

- g) NIHR HTA GBP2,033,469 A multi-centre cluster randomised controlled trial to evaluate the Guide to Action Care Home fall prevention programme in care homes for older people 2012-2014 **Logan (ChI), Robertson (co-investigator)**
- h) NIHR ARC EM GBP56,653 Falls in Care Homes Implementation study 2020-2021 **Logan (ChI)**

#### 4. Details of the impact

Research at the University of Nottingham has led to the implementation of new clinical interventions, changes to patient care practices, mitigation of potential harm, and significant improvements in the health outcomes of patients suffering falls across the UK.

##### Ambulance services

Our research (R1) demonstrated that appropriate referral to the community-based Falls Prevention Service reduced the rate of falls by 55%. This led to the implementation across the East Midlands of the first-of-its-kind clinical pathway - the "Falls Ambulance", staffed by a paramedic and specialist nurse [A]. The Associate Clinical Director of the East Midlands Ambulance Service NHS Trust stated: "*In direct response to the RCT a falls rapid response team (FRRT) was set up in Nottingham in 2013 [...] the service won awards as it was the first of its kind in the UK and a number of other ambulance services followed the Nottingham lead.*" [A]. The Kings Fund has included our research as an example of good practice in their 2014 report '*Making our health and care systems fit for an ageing population*' [B], which sets out a framework and tools to help local service leaders improve the care they provide for older people. Subsequently, 8 of the other 12 UK Ambulance Trusts have implemented a similar falls referral pathway. The reduction in pressure on over stretched emergency departments is demonstrated with examples of cost savings of GBP197,500 and a decrease of 552 attendances at A&E (a decrease of 75%) seen in East Lancashire alone between April 2016 and March 2017 [A, Royal College of Occupational Therapists report]. Data from our ambulance study has been used nationally to develop a Return on Investment (ROI) resource to help commissioners and communities provide cost-effective falls prevention activities. England's local authorities and Clinical Commissioning Groups (CCGs) can use results from the tool to protect and improve the health of their local populations when making commissioning decisions [C].

##### Physical activity

Our free online and downloadable resources for commissioners to use to plan, implement and monitor the Falls Management Exercise (FaME) programme following our PHISICAL study have been downloaded 884 times (between June 2019 and May 2020). NICE endorsement of the Toolkit (October 2019) acknowledges its accurate reflection of the NICE falls guideline and quality standard [D]. Two counties in England have commissioned the programme enabling over 1,500 people access to effective falls prevention intervention [E]. The PrAISED programme led to an innovative exercise class, in the University of Nottingham's sports centre, for people with dementia and their carers. This exercise class received BBC press coverage [F] and was attended by up to 30 people per week (between September 2017 and March 2020) (R6). This valued activity is currently paused due to COVID-19.

##### Care Homes

The GtACH intervention used in 87 care homes showed a significant (43%) reduction in falls in the 3-6 month period post randomisation (R8). 80% of staff in a caring role were trained. The research is impacting people's lives: One care home manager reports "*one gentleman's falls have reduced, he is much safer to mobilise, he's gained confidence and that has improved and had an impact on his quality of life.*" [G]. Another care home manager states "*our care home continues to use the GtACH screening and assessment tool, as we have seen the benefits in preventing, reducing and managing falls, increasing staff awareness. The tool has enabled us to communicate more effectively with our allied health care professionals and it has become an integral part of our daily practice.*" [H]. A lead community

research nurse states “*We have seen a positive reaction from care home personnel about the use of the GtACH programme and the falls resources by listening to feedback from care home managers*” [H]. This intervention is now being rolled out nationally through a programme designed to empower care home staff to lead its adoption [h].

Free online and downloadable ‘React to Falls’ resources have been co-developed with a production company for care home staff which include a training resource, pocket sized guides, and a smartphone app, available on Android and Apple platforms [J], developed as a direct result of care homes evaluation of the paper resources [I]. The online resource has had 1,799 unique views (between April and August 2019) with approximately 10% completing all five videos in the resource [J]. 770 care homes across the UK have received ‘React to Falls’ resources developed by the UoN, and 173 have so far provided feedback via survey with 96% (161/168) saying that they are likely or very likely to use the resource in their workplace [K].

The impact described in this case study has been recognised through the award of an MBE for services to occupational therapy, to Robertson, who worked across the NHS and the University of Nottingham on this falls research [L].

### 5. Sources to corroborate the impact

A. Letter from East Midlands Ambulance Service and Screenshots of 9 NHS Ambulance Trust websites re “Falls ambulance” and RCOP Reducing the pressure on hospital – 12 months on report 2016 p2. [Weblink](#)

B. Kings Fund 2014 ‘Making our health and care systems fit for an ageing population’ good practice example, p 23, 26 in the attached publication [Weblink](#).

C. Public Health England 2018 ‘A structured literature review to identify cost-effective interventions to prevent falls in older people living in the community’ [Weblink](#) p 27, 47, 107, 121, 150, 156.

D. NICE 2019 endorsement of the FaME Toolkit [Weblink](#).

E. Screenshots of emails from Leicestershire and Derbyshire where the FaME programme has been commissioned as a result of our research.

F. The university of Nottingham has invested in a dementia friendly falls prevention exercise programme in its sport centre. This initiative has received television coverage on the BBC. Press releases 2017 [University of Nottingham press release](#) and 2018 [BBC article](#).

G. Available on request. Film recorded with Care Home Manager and member of care staff talking about the impact for their residents in reducing falls, improving mobility and improving quality of life of being involved with the FinCH Study.

H. Testimonials outlining the value of Logan’s research in underpinning the development of the approach to falls management. One in a care home and the other across a geographical area of care homes.

I. Website link to [React to Falls](#) and [React to falls app](#) including UoN developers names.

J. Email confirming number of views of React to falls training resource.

K. Available on request Excel spreadsheet of survey results from React to Falls resource.

L. Link to New Year’s Honours List 2021, published 30 December 2020 in a supplement of the gazette official public record [weblink](#) : Cabinet Office [Weblink](#) (Robertson listed on p 99).