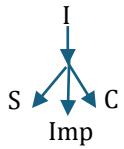
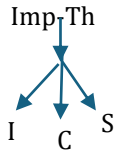
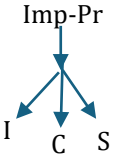
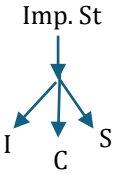
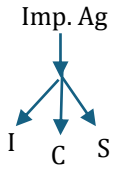
Appendix 1: Implementation effects on delivery of effective falls programmes

The table below is a summary of information relevant to implementation of falls prevention interventions extracted from 27 included intervention and implementation published and unpublished studies or reports, two systematic reviews and information drawn from four principal investigators interviews. This extracted information is organised using the Context and Implementation of Complex Interventions (CICI) framework[1].

First column abbreviations
I = Intervention
S = Setting
C = Context
Imp = Implementation, St = Strategy, Ag = agent, Th = Theory, Pr = process, Out = outcomes

Interactions	CICI Domain	Interaction effects
	Intervention Characteristics that interact with the setting, the context and implementation	**Characteristics** • Community based programmes: leisure centres, community-based halls, NHS Settings, sheltered accommodation, care homes • Progressive exercises for strength and balance • Training both quality assurance and delivery to multiple types of health care professionals • Hybrid programmes, e.g. home and group-based programmes **Interaction effects to** • maintain programme integrity in community settings • ensure "dose" of programme is maintained • engage commissioning agents to support programme fidelity
	Context aspects that interact with the implementation of the intervention	• Funding arrangements for programme: Budget constraints, changes and competition for funds and short-term funding arrangements affects programme fidelity • Oversight of programme delivery to spread in a region, place or geography to set standards is beneficial to avoid poor practice • Quality assurance processes can either inhibit programme instructors or improve their skills. • Local conditions drive local priorities and so any benefits from delivery of community-based programmes are influenced by successful cross-organisational partnerships. • Home-based programmes supported by digital technology with professional support provide tailoring and convenience to older person on programme. However, set up and access to internet and digital literacy can be barriers.

[1] Pfadenhauer LM, Gerhardus A, Mozygemba K, et al. Making sense of complexity in context and implementation: the Context and Implementation of Complex Interventions (CICI) framework. Implement Sci 2017;12(1):21. doi: 10.1186/s13012-017-0552-5 [published Online First: 20170215]

		• Effectiveness of group-based classes with mixed ability can be hindered with only one instructor.
	Use of implementation theory and how does it account the intervention, setting and context	• Multiple implementation frameworks (4) used in studies with modifications proposed in one study to Carroll's Implementation Fidelity Framework[2]. • Development of programme theory and other theories were used to explain findings and demonstrate how programme outcomes are impacted by setting and context.
	Implementation process stages of the implementation and how process interacts the intervention, setting and context	Process steps drawn from interviews found key elements were: • Issues when delivering programmes across multiple providers utilising different digital management systems (care homes, Action Falls) • To deliver widespread community-based programmes, recruitment of sufficient postural stability instructors can hamper progress (FaME) • Processes of programme set up for remote programmes can be more complicated for some older people (Standing Tall)
	Implementation strategies employed during implementation, and they interacted the intervention, setting, and context	• Development of implementation toolkits • Provide a Community of Practice and facilitate other professional support systems • Programmes include training and resources to professionals, identification of champions, provision of educational materials and support to older people using programmes e.g. website • Support monitoring and evaluation of programme delivered • Additional group class support (class assistants) to ensure tailored programmes to older person • Approaches to encourage programme adherence e.g. using Cognitive Behavioural Analysis techniques. • Programmes (e.g. FaME) can have follow on programmes (KAPA) to support maintenance of progress.
	Implementation agents involved in the implementation effort and how they interact with intervention, setting and context	Types of implementation agents used were: • Providing class assistants to support professionals • Specifically trained postural stability instructors or exercise specialists • Use of specific healthcare trained staff with additional specialist training e.g. physiotherapists • Trainer the trainers to cascade training in care homes. Specific interactions were: • Community of practices allowed engagement to provide modifications to delivery of programme. • Both older person and professional factors impact on effective programme implementation of the (inhibit or enable):

[2] Carroll, C., Patterson, M., Wood, S., Booth, A., Rick, J., & Balain, S. (2007). A conceptual framework for implementation fidelity. *Implementation Science*, *2*(1), 40. https://doi.org/10.1186/1748-5908-2-40

		○ State of health ○ Attitudes, fears, motivation ○ Ability to pay costs involved ○ Ability to travel ○ Maintenance following programme ○ Family or other support ○ Engagement and consultation of older people to ascertain what changes they are prepared to make in order to reduce their fall risk may enable better adherence. • Professional – to deliver programme as intended were: ○ Ensuring fidelity to programme components e.g. progressive exercises and completion of full programme ○ Personality ○ Professional background and experience ○ Specific to Action Falls programme for care home staff, was the engagement with training on falls and take responsibility for care home resident falls.
Imp. Out. ↓ I. Out	Implementation outcomes reported and how do they interact with intervention outcomes	Measures of implementation outcomes in studies included: fidelity, adherence, programme feasibility, attendance and completion rates, cost, acceptability. Impact of implementation outcomes on programme effectiveness • Effectiveness of intervention reduced by poor fidelity (professionals) and adherence (older person), attitudes to ageing (older person). • Cost can impact programme adoption and sustainability. • To sustain programme effectiveness would benefit from booster sessions to support long term adherence. • Fidelity and adherence can be impacted by older person's preferences. • Fidelity to programme impacted by instability in delivery by professional workforce's capacity and reliability (e.g. high turnover).
S ↓ C Imp	Setting interaction with the intervention, context and implementation	Types of settings covered by effective programmes are: • Community based: Halls, sheltered accommodation, leisure centres • Home based with or without remote support • Care homes Setting interactions are: • Programme delivery involving the third sector requires local governance and integration to provide effective programme standardisation and consistency of delivery across multiple providers. • Different providers have different reasons for programme adoption e.g. prioritising attendance numbers so impacts on quality and fidelity of programme delivery. Quality and programme integrity can also be a burden to some providers. • Settings may need to support and resource implementation of a programme and this can be challenging e.g. exercise space, staff availability, printing costs.

		• Use of care home resident management systems requires changes and removal of older conflicting documentation (de-implementation) and senior staff need to drive implementation. • Benefits to community settings include low cost of programmes. • Some community settings are not always suitable for some older people e.g. those less socially orientated for group programmes, attendance in bad weather and travel issues. • For staff who are not healthcare professionally trained, job security is a factor in supporting programme spread.