

Can an algorithm help deliver a more human-centred dementia care?

Co-design is key!

Co-Designing a Matching and Scheduling Prototype App to Personalise Domiciliary Dementia Care

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1 RATIONALE

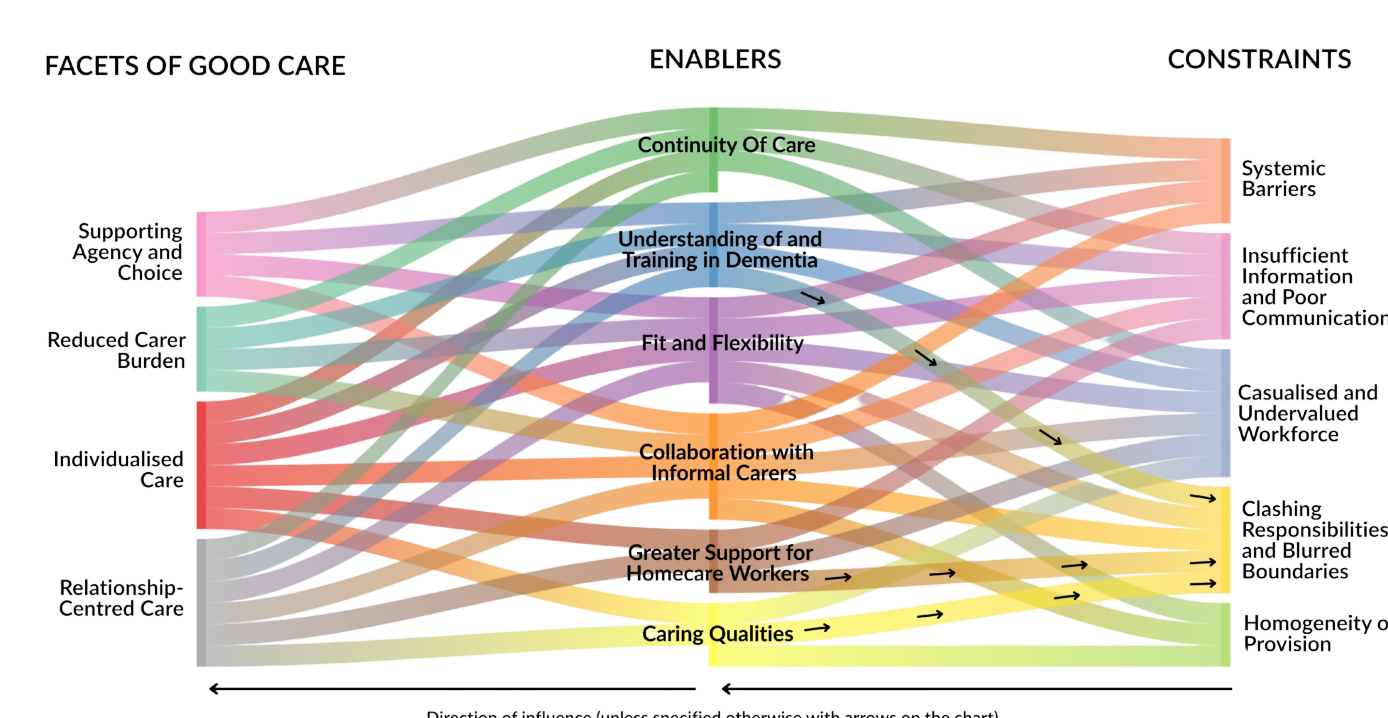
It is the desire of the majority of people living with dementia (PLwD) to remain living in their own homes - a desire is reflected in UK policy directives (Department of Health, 2009).

Stress, burnout, and high turnover are high among domiciliary care workers (Fleming & Taylor, 2007). Workers have more job satisfaction and better outcomes when they have a sense of flexibility within their working lives, and a knowledge that their care is having a positive impact (Donnellan et al, 2022).

Research also shows that matching care worker skills and characteristics to the specific needs and preferences of people with dementia and their families/friends can improve care (Dawson et al, 2015).

3 RAPID REVIEW

A systematic rapid review **what constitutes good domiciliary care** and the factors that enable or constrain its delivery reviewed 5,369 and included 31 research studies.

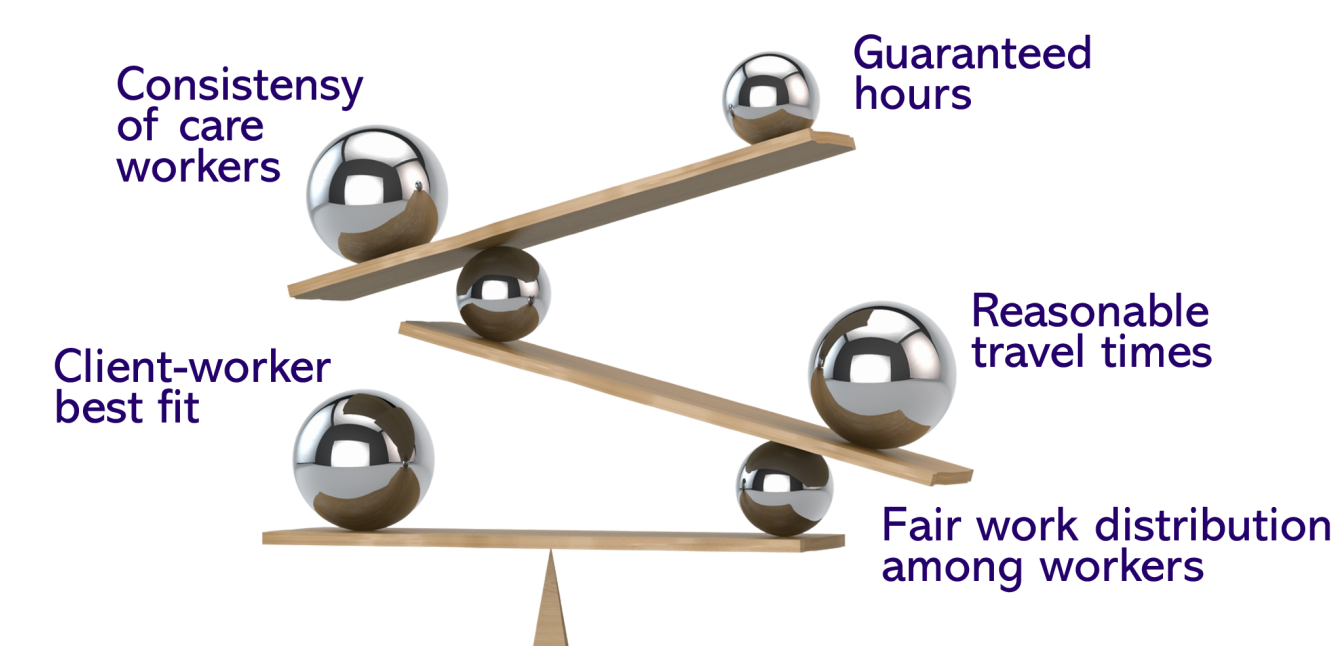


Good domiciliary care includes individualised, relationship-centred support for people living with dementia and their carers, yet everyday practice is complex and often constrained by interpersonal, organisational and systemic factors.

Addressing these influences is important for workforce stability and retention and for delivering care that aligns with principles of good dementia care.

5 CO-DESIGN

Six rounds of workshops totalling 30 hours and involving 4 people living with dementia, 6 family carers, 7 care workers and 1 care manager, plus individual feedback enabled us to **co-design and iteratively refine the prototype app**.



Participants identified competing priorities (e.g. continuity, best match, travel time and fairness), leading to design changes that balance and personalise stakeholder needs rather than optimise a single outcome.

7 ECONOMICS

Health economics oversight was integrated across all elements of work.

It identified key domains of value across health and social care, including workforce stability, service use, and wider societal impacts, and informed a framework to support future full economic evaluation of the platform.

Workforce retention emerged as a significant area of potential value for the app prototype: retaining a domiciliary care worker could save approximately £6,000 in recruitment and training costs. With around 425,000 domiciliary care workers supporting PLwD in the UK and a turnover rate of 22.2%, this highlights substantial system-level implications alongside benefits for care quality and continuity.

2 AIMS

To improve dementia care in the home by designing an app that:

- **matches the preferences** of people living with dementia, their family/friend supporters and care providers
- **enables 'live', needs-informed schedule creation** for care workers and clients
- The app also **balances the needs and wishes of four groups**:
 - People living with dementia
 - Family/friend carers
 - Domiciliary care workers
 - Domiciliary care company managers

4 FOCUS GROUPS

We explored the needs of people receiving and delivering dementia home care, and how technology could support care organisation.

Online focus groups/interviews with 4 people living with dementia, 18 unpaid carers, 20 care workers and 5 care managers.

Technology could improve communication, information sharing, care worker matching and flexible scheduling – but should complement, not replace, human judgement and must prioritise travel efficiency and fairness.

6 ALGORITHM & INTERFACE

Led by the co-design workshops, a team of computer scientists and software engineers created both the algorithm behind the prototype app and the app interface. The work comprised ~325 artboards and over 2,400 lines of code.

The prototype implements personalised matching of clients and care workers, configurable, personalised algorithms and live scheduling, creating a platform ready for future testing in home care services.



8 IMPLICATIONS

The project shows that co-designing preference-based matching and scheduling tools are feasible and valued by stakeholders.

Treating prototype development as a research activity enabled extensive, iterative involvement of people with lived and practice experience, ensuring the tool reflected real-world needs, yet also revealing tensions and competing priorities.