Understanding polypharmacy in older adults receiving home care: Insights from routinely collected data

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Background: Older adults receiving formal home care (domiciliary care) often experience complex medical needs and high medication burden, yet this population remains under-researched (1). While polypharmacy, typically defined as the use of five or more concurrent medications, has been studied in general older populations, its impact within the home care context remains poorly understood (2). A recent scoping review confirmed that, despite international interest, no UK study has systematically examined polypharmacy and adverse outcomes in this group (1). This study addresses a critical gap by focusing on real-world prescribing patterns and associated risks in older home care recipients.

Objectives: (1) To quantify the prevalence and prescribing patterns of polypharmacy in older adults (≥65) receiving formal home care in England; (2) to examine associations between polypharmacy and adverse outcomes including hospitalisation, mortality, and adverse drug reactions (ADRs: falls, constipation, incontinence) and; (3) to explore variation in medication exposure and outcomes by age, sex, and geographic region.

Methods: This retrospective cohort study uses CPRD Aurum (3) linked with Hospital Episode Statistics (HES) and Index of Multiple Deprivation (IMD) data. Eligible patients had a recorded home care event between 2015–2023.Polypharmacy is defined as the prescription of five or more distinct medications, excluding vaccines, topical agents, stoma products, dressings, and glucose monitors. To confirm ongoing use, patients must have received:

- At least two prescriptions for each medication within a 180-day window, and
- One within 90 days of the index (home care) date.Analyses include descriptive statistics and adjusted regression models assessing outcome risks by demographic and clinical factors.

Results: Feasibility work (n > 91,000) confirmed that it is possible to determine receipt of home care in CPRD, and that these individuals can be tracked longitudinally. Polypharmacy was a consistently prominent feature across the study population and time period, confirming this group's exposure to complex and sustained medication regimens. Variation was observed by age, sex, and region, suggesting that patterns of medication use differ across subgroups. Ongoing analyses will assess links between polypharmacy and adverse outcomes.

Conclusion: This is the first UK study to investigate polypharmacy and safety outcomes in the home care population using linked, routinely collected data. The study provides a robust approach to monitoring medication use in a previously overlooked group. These findings will support safer prescribing and better care planning for older adults receiving domiciliary care.

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Polypharmacy in older adults receiving home care: Trends and variation in a national primary Care dataset

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Introduction

Polypharmacy, commonly defined as the use of five or more medications, is common in older adults and associated with increased risk of harm. Yet older adults receiving formal home care are largely overlooked in national studies of prescribing patterns. Our recent scoping review found that most studies are descriptive, rarely focus on this group, and none in the UK have used primary care data to examine polypharmacy in home care recipients (1). This study aimed to examine national patterns and trends in polypharmacy among older adults receiving home care in England using CPRD Aurum linked with hospital and deprivation data.

Methods

- » Data source: Clinical Practice Research Datalink (CPRD) Aurum, linked with Hospital Episode Statistics (HES) and Index of Multiple Deprivation (IMD)
- » Population: Adults aged ≥65 with coded receipt of formal home care in England (2015–2023)
- » Index date: first recorded home care code in the study period
- » Polypharmacy definition: Concurrent use of ≥5 unique prescribed medications, identified using CPRD product codes and BNF chapters
    - » Excluded: vaccines, topical treatments, dressings, glucose monitors, stoma care
    - » Ongoing use: ≥2 prescriptions in 180 days, including ≥1 within 90 days before index
- » Analysis: Descriptive statistics used to summarise demographic and prescribing patterns at quarterly intervals
    - » Time-series decomposition used to separate long-term trends from seasonality
    - » Stratified by age, sex, region, and deprivation quintile
- » Patient and public involvement (PPI) representatives were actively engaged throughout the study to provide valuable perspectives on the research questions, methods, interpretation, and dissemination of findings.
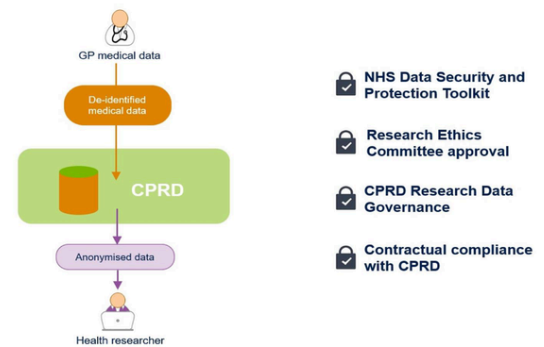
NHS Data Security and Protection Toolkit

Research Ethics Committee approval

CPRD Research Data Governance

Contractual compliance with CPRD

Figure 1. CPRD data flow and governance safeguards (2)

Results

- » Over 91,000 older adults with recorded home care were captured in CPRD Aurum (2015–2023), confirming that national primary care data can reliably capture this population.
- » Polypharmacy was common, with over a quarter of home care recipients prescribed five or more medications at study end (25.7%).
- » At the study end, men had a slightly higher polypharmacy rate than women (23.7% vs. 21.7%), despite greater absolute numbers in female recipients.
- » Substantial variation was observed by geography, with the highest prevalence in northern and eastern regions, and the lowest in Yorkshire and the Humber and the Southwest (Figure 2).
- » Polypharmacy prevalence increased steadily from 2000, peaked around 2015-2017, and declined modestly thereafter (Figure 3).
- » A positive gradient was observed, with polypharmacy prevalence increasing from 38.4% in the most deprived quintile to 45.8% in the least deprived quintile (Figure 4).
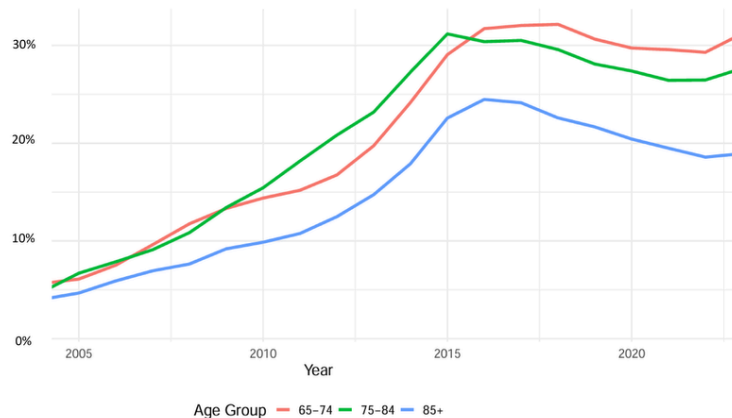
Figure 2. Polypharmacy prevalence by region and gender in home care recipients

Figure 3. Polypharmacy trends by age group (2000–2023): proportion of home care recipients with 5+ medications

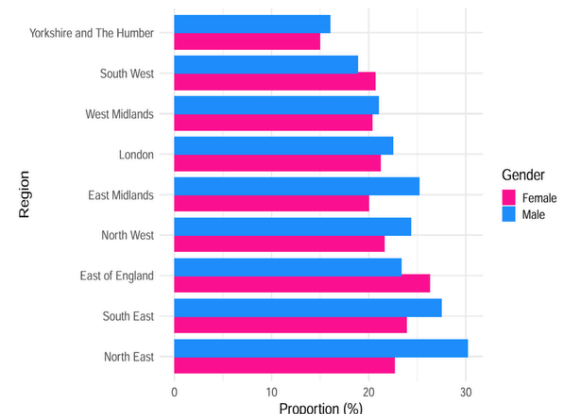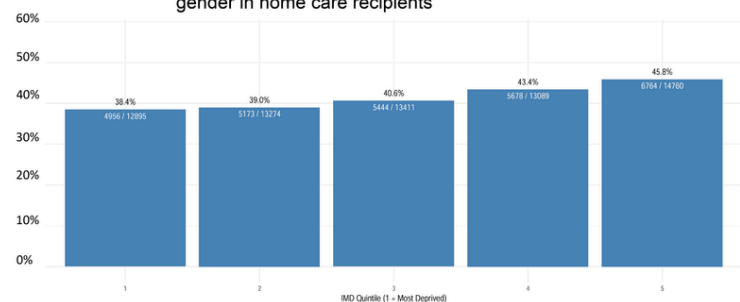**Figure 4.** Proportion of home care patients with polypharmacy in each IMD quintile, where 1 represents the most deprived and 5 the least deprived.

Conclusion

- » **This study is the first to characterise polypharmacy in older adults receiving home care** using national data in England, revealing variation by age, sex, region, and deprivation level.
- » **Highest prevalence in the least deprived IMD quintile**, reversing the usual health inequality gradient, potentially linked to differences in access, funding models, and prescribing practices.
- » **Post-2015 reversal in prescribing trends contrasts with the long-term UK rise**, suggesting impacts of national medicines optimisation guidance, although changes in coding, CPRD coverage, or clinical documentation may also contribute (3).
- » **Next steps**: Link prescribing to outcomes to inform targeted interventions.

References

1- Karimi R, Robinson-Barella A, Davey V, Sinclair DR, Hanratty B, Todd A. Understanding polypharmacy for people receiving home care services: a scoping review of the evidence. Age Ageing. 2025 Feb 2;54(2):afaf031. doi:10.1093/ageing/afaf031. PMID: 39970067; PMCID: PMC11837856. 2- Clinical Practice Research Datalink. Safeguarding patient data [Internet]. Medicines and Healthcare products Regulatory Agency; [cited 2025 Jun 3]. Available from: https://www.cprd.com/safeguarding-patient-data 3- Bennie M, Santa-Ana-Tellez Y, Galistiani GF, Trehony J, Despres J, Jouaville LS, et al. The prevalence of polypharmacy in older europeans: A multi-national database study of general practitioner prescribing. British Journal of Clinical Pharmacology. 2024;90(9):2124-36.

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