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Part 5: Care receipt, unmet need for care and frailty: a longitudinal analysis with multistate models

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Briefing Summary

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Abstract

Frailty is a well-established measure of health reserve among older individuals and is strongly associated with adverse clinical outcomes. The relationship between receiving care, or receiving insufficient care, and changes in a person's level of frailty remains unclear. This study used multistate models to investigate the associations between care receipt, unmet care needs, frailty status, and mortality. Covariates included age, gender, care status, wealth, area deprivation, education, and marital status. Care status was assessed through received care and self-reported unmet care needs. The findings show that receipt of care is a marker of increased susceptibility to frailty and identifies individuals less likely to recover from frailty. Wealth is an equally influential predictor of changes in frailty status, with individuals in the lowest wealth quintile who do not receive care being as likely to become frail as those in the highest wealth quintile who do receive care. Individuals starting to receive care (paid or unpaid) and people with the least wealth are potential target groups for interventions aimed at delaying the onset of frailty.

Background

Frailty is a valuable measure of the health of older people and is associated with adverse health outcomes, including greater mortality, falls, and use of health and social care services [1-3]. Many older people with frailty receive some social care. Unmet need for care exists where care provision does not meet the requirements of the care recipient. Providing care for people with frailty is estimated to be 4-9 times as expensive as caring for people without frailty [4].

This study aims to understand how receipt of care, unmet need for care and socio-economic characteristics are associated with longitudinal health outcomes, as measured by frailty. Longitudinal health and care data from the English Longitudinal Study of Ageing are modelled using multistate models to investigate the relationship between frailty and social care.

Methods

We used data from the English Longitudinal Study of Ageing (ELSA), a nationally representative prospective cohort study of people aged 50 and over in England [5]. ELSA has conducted interviews with its participants every two years from 2002-2019.

Frailty was measured using a frailty index, categorising ELSA participants as 'robust', 'prefrail', 'frail' or dead. Care was measured by two variables: (i) receiving any care and (ii) self-reported unmet need for care. Four socio-economic covariates were analysed in our models: wealth, educational attainment, marital status (self-reported measures) and area deprivation (derived from participant postcode).

Results

Care receipt (Table 1) was associated with a greater risk of increasing frailty and a lower chance of decreasing frailty. Unmet need for care was only associated with an increased risk of prefrail males becoming frail. Greater wealth was associated with a lower risk of transition to greater frailty states (i.e. robust-to-prefrail and prefrail-to-frail) and with increased recovery to less frail states. In nearly every instance, the risk

of frailty for someone with low wealth (vs high wealth) matches from the risk for someone receiving care (vs no care) (Table 1 and Figure 1). Wealth is associated with mortality, unlike care receipt and unmet need for care. Higher educational attainment, lower area deprivation and being married are all associated with a lower risk of increasing frailty.

Discussion

This longitudinal analysis, spanning 18 years of data, suggests that receiving care is a marker of people susceptible to frailty and less likely to recover from frailty to a less frail state. It also reveals that individuals with higher household wealth are less likely to develop frailty and have a greater likelihood of recovering to a less frail state than those with lower household wealth. Notably, household wealth outperforms other socio-economic factors such as area deprivation, education level, and marital status in predicting frailty.

The total England at-home formal social care costs could be reduced by £4.4 million per annum (2021 costs) for every 1% of robust people who are prevented from becoming frail [4]. This study highlights two groups that provide an opportunity for targeted interventions to reduce the occurrence and progression of frailty: individuals with lower wealth and those who are receiving care. Identifying people who start receiving care may be particularly helpful, as these people are least likely to have increased their level of frailty and so may benefit most from a proactive intervention. Although identifying people who receive unpaid care may be more complex than using registers of formal home care provision, identifying only those who receive paid for care risks exacerbating health inequalities, as wealthier households may be more likely to have paid for care.

Receiving care appears to be a better indicator of a person's change in frailty state than having unmet need for care. Unmet need for care had limited associations with changes in frailty status but was associated with increased risk of frailty for males. The small number of participants who reported any unmet needs for care limits the precision of these findings.

Conclusion

Our findings demonstrate that receiving care indicates increased susceptibility towards a frailer health state and identifies individuals who are less likely to experience a reduction in their level of frailty. Household wealth emerges as an equally influential factor in predicting these transitions. Individuals with lower levels of wealth who do not receive care are at comparable risk of frailty as those with high wealth who do receive care. Interventions aimed at preventing frailty would have the most impact for individuals who start to receive care, regardless of whether it is paid or unpaid care, and for people with lower levels of wealth. Unmet need for care does not appear to be strongly associated with changes in frailty, although this may be due to the small numbers reporting unmet needs in this dataset.

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Table 1: State transition hazard ratios and 95% confidence intervals [CI] for receiving care and wealth covariates. The risk of a person moving from one state to another is measured by its Hazard Ratio (HR). A hazard ratio greater than 1 indicates an increased risk of the transition occurring, whereas a hazard ratio less than 1 indicates a reduced risk of the transition occurring. Results are split by gender. Wealth is categorised as quintiles, with quintile 1 the least wealthy. It was not possible to accurately constrain the 95% CI of the robust-death transition for males in receipt of care due to the small number of recorded transitions.

Transition	Male		Female	
	Care receipt [CI]	Wealth [CI]	Care receipt [CI]	Wealth [CI]
Robust – Prefrail	2.0 9 [1.70-2.58]	0.8 7 [0.85-0.90]	1.7 5 [1.50-2.04]	0.8 8 [0.86-0.90]
Robust - Death	0.1 7 [-]	0.8 1 [0.70-0.94]	0.8 8 [0.14-5.59]	0.9 7 [1.16-1.16]
Prefrail – Robust	0.4 7 [0.39-0.55]	1.1 6 [1.13-1.20]	0.4 8 [0.42-0.54]	1.1 2 [1.15-1.15]
Prefrail - Frail	2.5 6 [2.27-2.90]	0.8 2 [0.78-0.85]	2.2 6 [2.05-2.48]	0.8 3 [0.86-0.86]
Prefrail - Death	1.1 0 [0.84-1.45]	0.9 5 [0.88-1.04]	1.1 7 [0.87-1.57]	0.8 4 [0.94-0.94]
Frail – Prefrail	0.6 5 [0.55-0.77]	1.0 8 [1.01-1.16]	0.6 4 [0.56-0.74]	1.1 8 [1.12-1.12]
Frail – Death	1.0 4 [0.86-1.26]	1.0 2 [0.96-1.09]	1.1 3 [0.92-1.40]	1.0 1 [1.07-1.07]

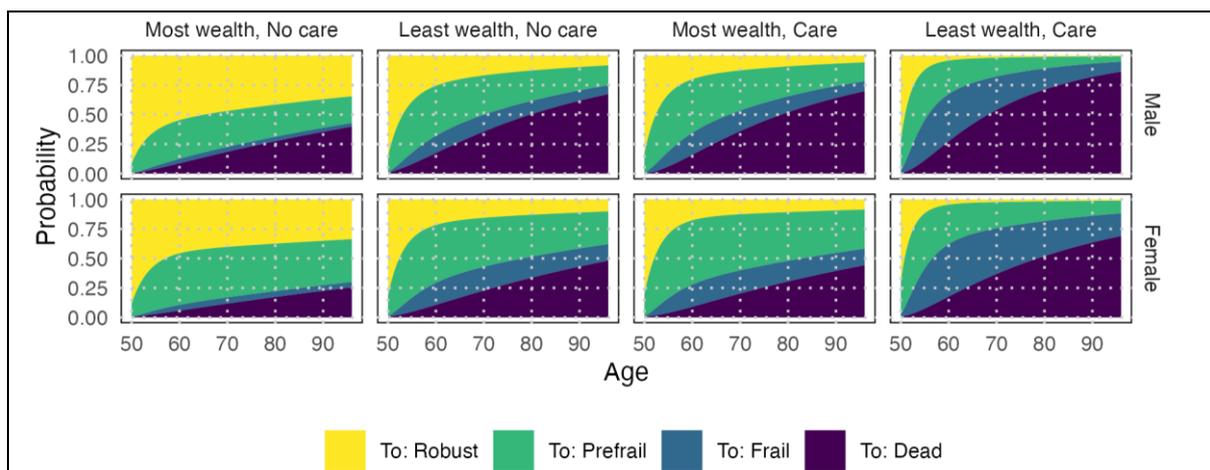


Figure 1: Transition probabilities from the robust (i.e. not frail) state to each frailty state and death from age 50-100 for males and females. Probabilities are categorised by wealth quintile and whether a person receives care. Individuals with the least wealthy quintile who receive no care have similar prospects as individuals in the wealthiest quintile who do receive care. Plot created with the `msm.stacked` R package [6].

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