

Public Support for Older Disabled People: Evidence from the English Longitudinal Study of Ageing on Receipt of Disability Benefits and Social Care Subsidy*

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Abstract

In England, state support for older people with disabilities consists of a national system of non-means-tested cash disability benefits and a locally administered

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means-tested system of social care. Evidence on how the combination of the two systems targets those in most need is lacking. We estimate a latent factor structural equation model of disability and receipt of one or both forms of support. The model integrates the measurement of disability and its influence on receipt of state support, allowing for the socio-economic gradient in disability, and adopts income and wealth constructs appropriate to each part of the model.

We find that receipt of each form of support rises as disability increases, with a strong concentration on the most disabled, especially for local-authority-funded care. The overlap between the two programmes is confined to the most disabled. Less than half of recipients of local-authority-funded care also receive a disability benefit; a third of those in the top 10 per cent of the disability distribution receive neither form of support. Despite being non-means-tested, disability benefits display a degree of income and wealth targeting, as a consequence of the socio-economic gradient in disability and likely disability benefit claims behaviour. The scope for improving income/wealth targeting of disability benefits by means testing them, as some have suggested, is thus less than might be expected.

Policy points

- Receipt of disability benefits (14 per cent) is much higher than receipt of publicly funded care (3.3 per cent) in the household population aged 65 and over in England.
- Receipt of each form of support rises as disability rises. Within the 10 per cent most disabled older people, the rate of receipt of disability benefits is 58 per cent and 23 per cent receive publicly funded social care.
- Overall, only about 50 per cent of older recipients of publicly funded care report receipt of disability benefits. Receipt of both forms of support is confined to the most disabled.
- A third of the 10 per cent most disabled older people receive neither disability benefits nor publicly funded social care.
- Disability benefits display a degree of income and wealth targeting without means testing: people on low income are more likely to be disabled and to claim their entitlement to public support.

I. Introduction

Increasing proportions of people are reaching the ages where the need for care and support with everyday activities becomes more likely. Worldwide, the number of people aged 85 or over is projected to double over the next two decades.¹ As a consequence, many countries must decide how best to

¹United Nations, 2017.

use public resources to help people meet the needs associated with impaired functioning. An important issue is whether state support should be focused on those least able to afford the cost of care via some form of means testing or whether the need for care alone should determine eligibility for publicly funded support.

There is a large literature on the merits of universalism versus targeting (usually through some form of means testing) in welfare programmes. Much of it concerns their respective poverty-/inequality-reducing properties.² The advantages of universalism over means testing are usually considered to be weaker adverse labour supply incentives and smaller administrative costs. The main disadvantage of universal systems is usually assumed to be that more of a programme's expenditure is likely to go to those who may not be in economic need.³

As described in more detail in Section II, England has a two-part system of public support for older people with disabilities: a national system of cash disability benefits which are neither means tested nor taxable, administered by the Department for Work and Pensions; and a means-tested system of publicly subsidised social care administered by local government. It has sometimes been suggested that, in comparison with social care, disability benefits are not well targeted⁴ because they are not means tested and hence must be received by people not in economic need. However, in previous work, we have shown that patterns of receipt of disability benefits for older people in England mimic to some degree the effect of means testing.⁵ Descriptive analysis suggests that receipt of disability benefits and receipt of publicly funded social care are both inversely related to (pre-disability-benefit) income.⁶

There has been relatively little assessment of the targeting of social care in England. A recent study⁷ used wave 4 (2008) of the English Longitudinal Study of Ageing (ELSA) to examine the socio-economic and demographic factors associated with receipt of care. It found that the numbers of activities of daily living (ADLs), instrumental activities of daily living (IADLs) and mobility activities with which respondents had difficulties were the strongest predictors of receiving publicly provided care. Income and wealth were not found to be significantly associated with receipt of publicly provided care, which is surprising given the means test.

There is considerable policy debate on the English system of support for older people with disabilities. Proposals for reform have included suggestions for closer integration of the two parts of the system and/or means testing of

²For example, Creedy (1996) and van Lancker and van Mechelen (2015).

³For example, Besley (1990).

⁴See, for example, Wanless (2006) and Department of Health (2009).

⁵Hancock et al., 2015.

⁶Hancock, Morciano and Pudney, 2016.

⁷Vlachantoni et al., 2015.

disability benefits.⁸ Decisions on potential reforms need to be informed by good evidence on how well the two parts of the current system of support work in combination in terms of reaching those in most need. We are not aware of any research addressing this issue.

The first aim of this paper is to contribute to the debate on means testing versus universalism, in the context of disability in later life taking the specific example of the two-part English system in which one part (social care) is stringently means tested while the other (cash disability benefits) is not. A second important aim is to address difficulties in the measurement of disability and in the construction of appropriate income measures for use in the assessment of the degree of income targeting. We extend previous research on attendance allowance,⁹ adopting a similar latent variable approach to allow for the noise inherent in self-reported indicators of disability. We exploit new data on social care which were collected in wave 6 (2012) of ELSA, which allow us to expand the analysis to include receipt of publicly and privately funded social care as well as disability benefits. The analysis requires careful construction of income and wealth variables appropriate to each part of the model. Specific definitions of current income and wealth enter the social care means test rule in a particular way, but quite different concepts of income and wealth are relevant to the incidence and severity of disability and the propensity to claim entitlements to public support. Section II describes the systems of state-funded social care and disability benefits for older people operating in England. Section III reviews methods used in previous research evaluating the targeting of disability benefits and explains our preferred econometric approach. Its implementation is set out in Section IV. Estimation results are presented in Section V, and Section VI aids their interpretation through post-estimation analyses. Section VII concludes.

II. Social care and disability benefits for older people in England

England has a two-part system of public support for older people with disabilities: a national system of cash disability benefits administered by the Department for Work and Pensions (DWP); and a local-government-administered system of social care. Disability benefits for older people consist of two main benefits: *attendance allowance* (AA), which can be claimed from age 65 onwards; and *disability living allowance* (DLA),¹⁰ which must be claimed before reaching 65 but can continue in payment beyond 65. AA and DLA are tax-free and not means tested (although their receipt can

⁸See, for example, Wanless (2006), Department of Health (2009), Commission on the Future of Health and Social Care in England (2014) and Department for Communities and Local Government (2015).

⁹Hancock et al., 2015.

¹⁰From April 2013, DLA is gradually being replaced by the personal independence payment (PIP), which differs from DLA in certain details. Very few over-65s are currently receiving PIPs.

trigger additions to means-tested benefits). AA and DLA are intended to contribute towards the extra living costs that disabled people face, such as more expensive transport and the cost of help with daily living activities. AA has two possible weekly rates: £57.30 or £85.60 from April 2018, while DLA payments range from £22.65 to £145.35. In May 2017, there were 0.7 million DLA recipients aged 65 and over, and 1.2 million AA recipients in England, comprising respectively 6 per cent and 11 per cent of the 65+ population.¹¹

Publicly funded social care in England is organised by local authorities (LAs).¹² The system entails both a stringent disability test and a means test. National guidance determines the principles of the means test for people receiving care in their own homes¹³ while leaving LAs discretion over some of its details. Even if care needs are assessed as high, there is no entitlement to publicly funded social care if total financial assets are above an upper threshold of at least £23,250 (some LAs use higher thresholds). The local authority will require eligible disabled older people to meet the costs of their care up to the point where disposable income would fall below 125 per cent of the guaranteed minimum income level, known as the ‘guarantee credit’ (GC), which is embodied in the means-tested benefit system; there will be no entitlement to publicly funded social care if income is above this level plus the cost of care that the LA assesses as required.

The reach of the social care system is much less than that of the disability benefit system. In March 2017, the number of older people in England receiving long-term LA social care in their own homes or in a care home was 400,300¹⁴ – around 4 per cent of the total population in England aged 65+. There are no administrative figures on the overlap between the two forms of support.

III. A coherent approach to measuring disability and targeting of public support

Disability is a difficult concept. There are many different aspects of disability – its physiological/psychological sources, its severity, its intermittent or persistent nature, its incidence in relation to certain activities rather than others. Policy analysts have struggled with this complexity,¹⁵ but policy must necessarily impose simplicity by making a distinction between people judged eligible for public support and others who are not.

¹¹Source: DWP tabulator tool, <https://stat-xplore.dwp.gov.uk/>; accessed 5 December 2017.

¹²Similar arrangements exist in Wales and Scotland but personal care in Scotland is not means tested. In Northern Ireland, social care is run by health and social care trusts.

¹³Although ELSA covers some people in care homes, the information collected for them is insufficient to include them in our analysis.

¹⁴Source: Table 25 (‘Number of clients accessing long term support at the end of the year (31 March) by age band’) of Health and Social Care Information Centre (2017).

¹⁵Haveman and Wolfe, 2000; Altman, 2001.

Given the practical requirements of policy design, there are obvious advantages in using an approach to policy analysis that works with a simple one-dimensional measure of disability at the individual level. Such a measure cannot be observed directly in household surveys, but must be constructed or inferred from information that surveys are able to provide. General self-reported measures of health status, such as presence of diagnosed medical conditions, are limited indicators of an individual's functional dependence in basic tasks of everyday life¹⁶ that is often the basis for determining eligibility for disability programmes. Disability indices based on difficulties with ADLs¹⁷ and IADLs¹⁸ are perhaps the most widely used examples.

There is a long history of attempts to evaluate disability benefit targeting in the research literature. One simple approach uses a single-equation framework in which receipt of disability benefits is regressed on an assortment of disability/health indicators (or a summary scale of them) and other characteristics found to be relevant in influencing benefit receipt. See Zantomio (2013) and Banks, Blundell and Emmerson (2015) as empirical examples applied to the UK context. An alternative approach uses a two-stage method: principal component analysis (PCA) is first used to construct a disability index as a weighted average of the set of available indicators, with weights chosen so that the index captures as much of the covariation in the indicators as possible. At the second stage, the constructed measure is used for analysis of the policy response to disability and treated as if it were a directly measured variable. The PCA approach has been used in many contexts – for instance, by Poterba, Venti and Wise (2013) to measure general health in relation to wealth after retirement and by Croda, Skinner and Yasaitis (2013) to assess target efficiency of disability programmes for working-age people in Europe. It has three main drawbacks. First, the PCA approach does not take into account the different amounts of measurement noise in each self-reported health indicator.¹⁹ Second, using the derived PCA disability score in a classical econometric (regression) procedure generally leads to biased coefficient estimators.²⁰ Third, the approach does not account for unobserved variability in *true* health²¹ as well as in individuals' survey reporting.²²

In our view, a better approach is to work with an explicit statistical model that allows for the coarse and error-prone nature of the survey indicators of disability and also integrates, within a comprehensive statistical framework, the two aspects of disability measurement and outcomes at the individual level

¹⁶Wiener et al., 1990.

¹⁷Katz et al., 1963.

¹⁸Lawton and Brody, 1969.

¹⁹Bound, Brown and Mathiowetz, 2001.

²⁰Liu, 1988.

²¹Deaton and Paxson, 2001; Graham, 2009.

²²Bago d'Uva et al., 2011.

of policy on public support for people with disabilities. The main advantage of this unified treatment over simpler two-stage methods is that both the survey indicators of disability and the measures of policy outcome contain information about the underlying disability state, so that it makes fuller use of the available information relating to disability.

Our econometric approach is closely related to that proposed by, for example, Lee (1982) and recently used by Hancock et al. (2015) and Morciano, Hancock and Pudney (2015), in considering health status / disability as a latent concept. Suppose we have a representative sample of individuals and let d_i be the unobserved degree of disability for the i^{th} sampled individual. We observe in the survey a set of J binary indicators of the difficulties caused by the individual's health condition(s): D_{i1}, \dots, D_{iJ} .

The following *measurement equations* embody the assumption that the observed indicators relate to the underlying disability via a linear function involving statistical 'noise' represented by a set of mutually independent random errors e_{i1}, \dots, e_{iJ} :

$$(1) \quad D_{ij} = \begin{cases} 1 & \text{if } \lambda_{0j} + \lambda_{1j}d_i + e_{ij} > 0 \\ 0 & \text{otherwise} \end{cases}$$

and we allow the data to determine the degree of noise, $\sigma_j^2 = \text{var}(e_{ij})$, in each of the survey indicators, by treating $\sigma_1^2, \dots, \sigma_J^2$ as parameters to be estimated. The coefficients $\lambda_{11}, \dots, \lambda_{1J}$ are the *factor loadings*, which reflect the sensitivity of each indicator as a measure of underlying disability. Although we assume that D_{ij} contains binary self-reported indicators, our framework can be extended easily to continuous and Likert-scale response indicators as well as objective measures of health.

We specify a regression model (the *disability model*) of the relationship between underlying (latent) disability d_i and its socio-economic determinants summarised by a set of covariates \mathbf{W}_i :

$$(2) \quad d_i = \mathbf{W}_i\alpha + u_i,$$

where u_i is a $N(0, \sigma_d^2)$ random residual. Subject to arbitrary normalisation conditions (such as $\lambda_{01} = 0, \lambda_{11} = 1$) required to fix the location and scale of latent disability, a disability model comprising only equations 1 and 2 could be estimated by maximum likelihood. Instead, we estimate the equations jointly with two further statistical relationships linking receipt of social care and receipt of disability benefit to latent disability, d_i .

We distinguish three care states: $C_i = 0$ indicates no receipt of social care services; $C_i = 1$ indicates receipt of only private care services; and $C_i = 2$ indicates receipt of public care services (with or without additional privately purchased top-up). Conditional on the disability state d_i and a set of covariates

\mathbf{X}_i , the probabilities of the two types of care receipt are given by a multinomial logit structure:

$$(3) \quad \Pr(C_i = k | d_i, \mathbf{X}_i) = \frac{e^{\mathbf{X}_i \beta_k + \gamma_k d_i + \rho_k V_i}}{1 + e^{\mathbf{X}_i \beta_1 + \gamma_1 d_i + \rho_1 V_i} + e^{\mathbf{X}_i \beta_2 + \gamma_2 d_i + \rho_2 V_i}}, \quad k = 1, 2.$$

The other form of public support is disability benefit, receipt of which is indicated by the binary variable B_i . Conditional on disability d_i and a further set of covariates \mathbf{Z}_i , the probability of benefit receipt is specified as a logistic regression:

$$(4) \quad \Pr(B_i = 1 | d_i, \mathbf{Z}_i) = \frac{e^{\mathbf{Z}_i \delta + \theta d_i + V_i}}{1 + e^{\mathbf{Z}_i \delta + \theta d_i + V_i}}.$$

We allow for residual correlation between equations 3 and 4 by including the latent $N(0, 1)$ variable V_i to represent unobserved factors (such as access to informal support, attitudes to dependency, and ability to negotiate the claims process) linking receipt of formal care and disability benefits. Without loss of generality, the coefficient of V_i in equation 4 is set to unity as an arbitrary normalisation to identify the structure. Equations 1–4 are estimated simultaneously. Our approach therefore differs from the approach used by Poterba, Venti and Wise (2011, 2013 and 2017) and Croda, Skinner and Yasaitis (2013), where a PCA is used to derive a latent index which (a) accounts neither for measurement errors nor for the socio-economic–health gradient and (b) is used as exogenous covariate in a subsequent model of the outcome of interest. From a strict statistical viewpoint, if the model is correctly specified, it is preferable to estimate the measurement equation jointly with the outcome regression, and there is no need to estimate the latent variable separately.

IV. Data and implementation of the statistical model

We use data from wave 6 (May 2012 to June 2013) of ELSA. ELSA is a nationally representative survey collecting data on health, disability, financial circumstances and well-being of people aged 50 and over ('core members') and their partners living in private households in England.²³ Fieldwork began in 2002 and sample members have been reinterviewed at two-yearly intervals

²³ELSA is the result of collaboration between University College London, the Institute for Fiscal Studies (IFS) and the National Centre for Social Research (NatCen). The universities of Cambridge, East Anglia and Exeter provided expert advice on specific modules. Many of the health measures adopted in ELSA are comparable to those in the Health and Retirement Survey conducted in the US (Banks and Smith, 2012) and the Survey of Health and Retirement in Europe (Börsch-Supan, Hank and Jürges, 2005). See documentation at <http://www.elsa-project.ac.uk/> for a fuller description.

since then. The original ELSA cohort, interviewed in 2002–03, was drawn from households who responded to the 1998, 1999 and 2001 cross-sectional Health Survey for England (HSE). Refreshment cohorts drawn from later HSEs were added to the original ELSA sample to ensure the study continued to cover the youngest age group and to address attrition at older ages.

Wave 6 of ELSA included new questions on receipt of, and payment for, social care, which were originally developed for use in the HSE.²⁴ They improve on questions in previous ELSA waves, distinguishing more clearly between respondents who receive social care with financial support from a local authority and those who rely on care purchased privately. The new questions follow modules on health and disability; questions on receipt of disability benefits appear later still in the questionnaire. The social care and disability benefit questions are thus not vulnerable to the ‘justification bias’ that can arise if questions on receipt of public support for disability precede those on disability.²⁵ The new data allow us to estimate the gross cost of social care received, which is important in calculating an individual’s liability (and ability) to pay for their care.

Like the earlier versions, the new social care questions are asked only of people who report difficulties with ADLs or IADLs. In contrast, receipt of disability benefits is asked of all respondents even if they report no ADL/IADL difficulties. An assumption that people who report no ADL/IADL difficulties do not receive social care might bias our results towards a conclusion that publicly funded social care is better targeted than disability benefits: there would apparently be no ‘leakage’ of social care spending to those who report no disabilities. However, we analysed the 2011 and 2012 HSEs, which included the same social care questions but asked of all sample members aged 65 and over, and found that less than 2 per cent of the sample receiving LA-supported care reported no ADL/IADL difficulties.²⁶ Moreover, the reach of LA-funded social care observed in ELSA is comparable to administrative figures: of the over-65 non-care-home population, about 3.2 per cent received LA-supported care in March 2012.

1. Sample selection

Our analysis focuses on the 65+ population as programmes for this age group have been at the centre of policy debate. This age restriction also has the advantage of reducing the potential for endogeneity whereby, for working-age adults, the availability of disability benefits and publicly subsidised social care could reduce labour supply and earnings, and hence pre-benefit income.

²⁴Balarajan et al., 2009; Blake et al., 2010; Curtis and Burns, 2015.

²⁵Crossley and Kennedy, 2002.

²⁶In this paper, we use ELSA rather than HSE because ELSA offers a larger sample size and collects fuller income information.

Respondents with missing values for variables included in the analysis were excluded, resulting in a total sample size of 5,125 (corresponding to about 97 per cent of the total sample of core members aged 65+ interviewed in wave 6). The ELSA sample is affected by non-response in the HSE, initial refusal to take part in ELSA and cumulative attrition after initial participation in ELSA.²⁷ We therefore apply the ELSA sample weights to mitigate the bias that could result from such non-response.

2. Disability measurement equations

The binary disability indicators D_j are derived from questions on mobility, strength and dexterity and on difficulties with ADLs/IADLs. These questions have been used in previous ELSA-based studies.²⁸ We also include indicators of the presence of housing adaptations to help meet disability needs and of whether respondents had poor eyesight, hearing problems or any visible physical or mental impairment as assessed by the survey interviewer. Although ELSA includes objective physical and cognitive functioning tests, and a range of biomarkers, we do not exploit them here to limit potential bias associated with non-random consent to these tests.²⁹ Table A.1 in Appendix A (available online) provides the full list of 30 indicators used in the measurement equations, together with their means and standard errors.

3. Latent disability equation

In the latent disability equation, the covariates \mathbf{W}_i represent all the major influences on later-life disability. As far as possible, they should capture circumstances and resources over the life course that may affect current health, including diagnosed health conditions and socio-economic and demographic factors. We include in \mathbf{W}_i indicators of diagnosed physical conditions (such as stroke, cancer, lung disease, asthma, arthritis and osteoporosis), chronic cognitive conditions (such as Parkinson's, Alzheimer's, dementia and other cognitive degenerative disorders) and cardiovascular diseases (such as heart problems, diabetes, cholesterol, angina and high blood pressure). Diagnosed conditions are included in \mathbf{W}_i rather than in D_j as it is generally accepted

²⁷Bridges et al., 2015.

²⁸Ermisch, 2014; Banks, Blundell and Emmerson, 2015; Hancock et al., 2015; Vlachantoni et al., 2015.

²⁹Physical examination and performance data (for example, walking speed and tests on cognitive function) are affected by relevant and non-ignorable item non-response. About 15 per cent of our sample did not complete the first and the second walking tests. The reach of disability benefits (B) and LA-supported care (C_2) was higher among those who did not undertake the test ($B = 32.4$ per cent; $C_2 = 12.5$ per cent) than among performers ($B = 9.2$ per cent; $C_2 = 0.1$ per cent). Cognitive tests were impaired or not performed for about 15.6 per cent of our sample, with the receipt of B and C_2 higher among those who did not perform the tests. Similar patterns occurred in the comparison of those who did and did not participate in the nurse visit through which biomarkers were collected.

that chronic conditions are potential causes of functional disability rather than measures of functional disability.³⁰

Early-life living standards and parental socio-economic status are known to influence individuals' accumulation of advantage or disadvantage in socio-economic status and health.³¹ We therefore include in \mathbf{W}_i indicators of the respondent's father's economic status when the respondent was 14 years old: whether he worked in casual jobs or he was economically inactive, unemployed or prevented from working by disability; and, if economically active, whether or not he was in a managerial, professional or technical job or running his own business. \mathbf{W}_i also includes the respondent's age on leaving education and a dummy variable indicating whether receiving or expecting to receive either an employer pension or a personal/private pension.

The income and wealth variables included in \mathbf{W}_i are specified to capture lifetime economic resources. Wealth includes financial, net primary housing and physical (other properties, businesses, other physical assets) wealth. Income comprises income from pensions and investments (interests, rent, dividends, private pensions, annuities) and earnings, net of income taxes and housing costs. Disability-related benefits (whose receipt is clearly determined by disability rather than being an influence on disability) and means-tested benefits (where entitlement depends on other current income and wealth) are excluded. Income and wealth variables, totalled for the household and then ascribed to each household member, are expressed per capita in constant 2015 prices. Additional personal characteristics included in \mathbf{W}_i are age, gender and current partnership status (married or cohabiting versus single).

4. Receipt of care and disability benefit equations

We identify disability benefit recipients as respondents who reported receiving either AA or DLA. Recipients of LA-funded care are defined as those who reported that a local authority contributed towards the cost of their social care and the estimated gross cost of their social care was greater than the contribution that was made by the individual or family towards the cost. Appendix B (available online) details how we estimate the gross cost of social care received by respondents and the contribution to its cost made by the LA.

Receipt of public social care and disability benefits is determined partly by claim behaviour and partly by eligibility rules and their administration. Eligible individuals may fail to claim because, for example, they think a claim would be unsuccessful, there are costs associated with claiming, they lack the skills to navigate the claim system or they fear stigmatisation. Although these factors are not observable directly, there are variables known to be associated with

³⁰Johnson and Wolinsky, 1993; Verbrugge and Jette, 1994.

³¹Currie, 2009.

claim behaviour which can be included in \mathbf{X}_i and \mathbf{Z}_i in the semi-reduced-form equations 3 and 4. Following previous relevant work,³² we include the following as likely influences on claim behaviour: age, gender, current partnership status (married or cohabiting versus single), age left education and whether the respondent is a social renter. The last of these is intended in part to capture contact with the welfare system, which may increase the propensity to claim entitlements to social care or disability benefits.

In addition to the means test, income also influences individual decisions to apply to local authorities for social care, since the ability to self-finance is strongly related to current income. We construct the vector \mathbf{X} in a way that approximates the effect of the means test superimposed on claim behaviour. Therefore, in addition to socio-demographic variables listed above, the vector \mathbf{X} contains indicators of whether the respondent meets each of the income and assets components of the means test and, if not, how far their income or assets are above the corresponding threshold. An individual is calculated to meet the income test if $Y - c \leq 1.25GC$, with Y representing assessable income and c an estimate of the gross cost of care received. Assessable income differs from the measure of income included in \mathbf{W} because it includes disability-related and means-tested benefits. The test on financial assets (F) is based on whether the net per-capita amount of financial assets reported by the respondent and any partner falls below £23,250.³³

Where respondents had income or assets above the relevant thresholds, we computed measures of the distances from these thresholds as follows:

$$(5) \quad \begin{aligned} \text{Income : } & \frac{Y - c - 1.25GC}{c + 1.25GC} \quad \text{if } Y - c > 1.25GC; \quad 0 \text{ otherwise.} \\ \text{Assets : } & \frac{F - 23,250}{23,250} \quad \text{if } F > 23,250; \quad 0 \text{ otherwise.} \end{aligned}$$

Further details of the construction of these measures and the gross cost of care, c , are included in Appendix B. Locally weighted regressions of the probability of receiving LA-subsidised care by the degree to which the respondent appears to be beyond the means-test thresholds are given in Figures B.1 and B.2. They suggest that we are able to simulate the income test quite well (the empirical rate of LA-funded care receipt is virtually zero above the threshold), but the asset test is harder to simulate accurately. This could be due to measurement problems with self-reported measures of wealth. But LAs have some discretion

³²Pudney, Hancock and Sutherland, 2006; Hernandez and Pudney, 2007; Zantomio, 2013.

³³In practice, the income test can be more complicated in the case of couples, with LAs having some discretion over how couples are assessed. Appendix B presents some sensitivity analysis of the form of assessment for couples but the effects on the main econometric results presented in Section V were found to be negligible.

in implementing national guidance on the means test, and it is possible that they make more use of that discretion in the assets test than in the income test.

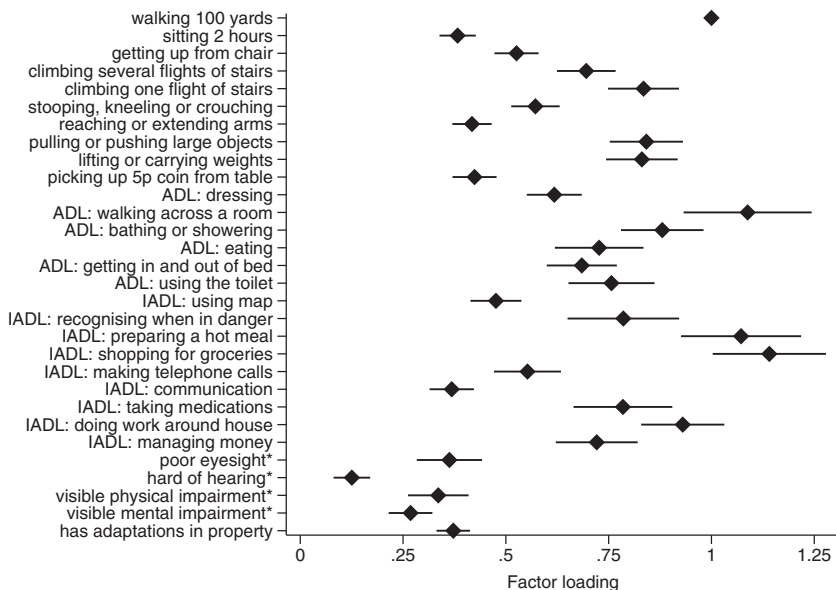
The absence of a means test for disability benefits implies that, in equation 4, income influences benefit receipt primarily through the incentive to claim, and the income effect therefore operates in a smoother way than for receipt of LA-funded social care. Construction of the covariate vector \mathbf{Z}_i reflects this, with pre-disability-benefit income (net of income taxes and housing costs) and financial wealth entered as continuous variables.

Rates of receipt of public support and mean values for elements of \mathbf{W}_i , \mathbf{X}_i and \mathbf{Z}_i are given in Table A.2 in the online appendix.

V. Estimation results

Factor loading estimates for equation 1 are plotted in Figure 1 with their 95 per cent confidence intervals. They represent the effect of latent disability on each disability indicator. All factor loadings have the expected positive sign, meaning that higher underlying disability generates more reported difficulties

FIGURE 1
Factor loadings and 95 per cent confidence intervals of the measurement model for latent disability



*Indicator constructed using the interviewer's report (see text for details).

Note: The factor loading associated with 'walking 100 yards' is constrained to be 1 to normalise the scale of the continuous latent variable. Constraining alternative factor loadings yielded virtually identical results.

with mobility, strength and dexterity, limitations in (I)ADLs and so on. They are also all statistically significant at the 1 per cent level, most of them very strongly. The factor loading for the self-reported disability indicators are generally larger than those for the interviewer-reported measures. The largest factor loadings are for activities requiring mobility/strength, bathing, preparing hot meals and shopping.

Structural parameters for the latent disability equation (equation 2) are reported in the first column of Table 1. The presence of a degenerative cognitive condition such as Parkinson's, Alzheimer's or dementia increases the latent disability index (d) by 3.01 standard deviation units whereas the presence of physical conditions such as stroke, cancer, lung disease, asthma, arthritis and osteoporosis produces an estimated increase in the latent index of about 1.04 standard deviation units. Suffering from cardiovascular diseases produces an increase of 0.61 standard deviation units in d .

Latent disability increases significantly with age and it is higher for single people than for those who are married or cohabiting. It is also higher for women than men. The estimated effects on disability of early-life living standards as measured by father's socio-economic status, own education, homeownership, membership of private pension plans, income and financial wealth all contribute to a consistent picture of a socio-economic gradient in disability.

The second and third columns of Table 1 show estimates of the effects of covariates on the log odds of receipt of privately funded care (column 2) and LA-funded care (column 3) as opposed to non-receipt of care. Disability level, age, education and satisfying the income component of the means test all exert positive influences on being a care recipient. The effects of disability and satisfying the income test are both larger for receipt of LA-funded care than for receipt of only privately funded care, whereas the effects of age and education are smaller for LA-funded care. Living with a partner reduces the odds of receiving care rather than no care but more so for LA-funded care than for privately funded care. Having assets above the means-test threshold reduces the odds of being in receipt of either form of care but the coefficient estimate is statistically significant for only privately funded care. The extent to which assets exceed the means-test threshold does not have a statistically significant effect on receipt of privately paid-for or LA-funded care. We found no significant gender or housing tenure effects at conventional levels of statistical significance.

Estimates of the parameters of equation 4 for receipt of disability benefits are reported in the final column of Table 1. Latent disability has a dominant positive effect on receipt of disability benefits, as we would expect. But other coefficients suggest the existence of further important determinants. Income and wealth both have significant negative effects on benefit receipt despite the absence of means testing and we interpret this as evidence of strong

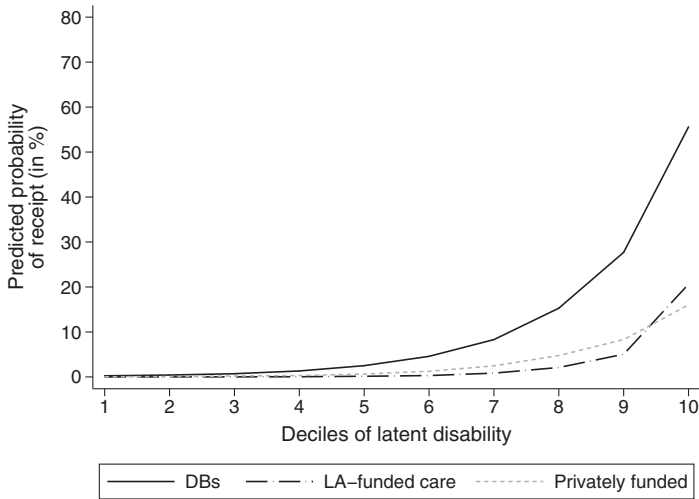
TABLE 1
Structural parameters of the latent disability equation and for receipt of social care and disability benefits (AA/DLA)

	Latent disability	Receipt of care Private payers LA supported	Receipt of disability benefits
Latent disability index			0.543***
Diagnosed cognitive conditions (1 = yes, 0 = no)	3.007***	0.494***	
Diagnosed physical conditions (1 = yes, 0 = no)	1.039***		
Diagnosed cardiovascular diseases (1 = yes, 0 = no)	0.613***		
Age (in years)	0.114***	0.076***	-0.012
Married or cohabiting (1 = yes, 0 = no)	-0.456***	-1.297***	-0.081
Female (1 = yes, 0 = no)	0.858***	0.304	-0.378***
Age left education (in years)	-0.194***	0.266***	-0.090**
Father's main job when respondent aged 14 (1 = yes, 0 = no): casual jobs, retired, unemployed, sick/disabled managerial, professional, technical job or self-employed	0.483** -0.053		
Rights in private/employer pension scheme(s) (1 = yes, 0 = no)	-0.481***		
Homeowner (1 = yes, 0 = no)	-1.257***		
Social renter (1 = yes, 0 = no)	-0.094***	-0.152	0.672***
Per-capita net wealth (£'00,000)	-0.114*		
Per-capita original income (£'000 p.m.)			
Income test met (1 = yes, 0 = no)		0.528**	
Proportional distance above income-test threshold		-0.285	
Assets above the means-test threshold (1 = yes, 0 = no)		-0.412*	
Proportional distance above asset means-test threshold		0.022	
Per-capita net pre-disability-benefits income (£'000 p.m.)			-0.263**
Per-capita net financial wealth (£'00,000)			-0.429***
Constant		-18.158***	-6.449***
Variance σ_d^2	10.358***		
Covariance parameter ρ_j		0.969***	1

Note: Observations = 5,125. Significance level – *** = 1 per cent; ** = 5 per cent; * = 10 per cent. Goodness-of-fit statistics – log-likelihood: -37,495.99; degrees of freedom: 106; AIC: 75,203.99; BIC: 75,897.43.

FIGURE 2

Average predicted probabilities of care and disability benefit (DB) receipt by decile of latent disability



economic incentive effects on the propensity to claim benefit. The strong positive coefficient for being a social renter is a common finding in studies of take-up behaviour and we have previously argued that this is likely to be related to access to advisory and support services that many social landlords offer.³⁴ The negative impacts of education and female gender are also typical findings, although the explanation for them is less clear. In contrast to receipt of care, neither age nor cohabitation is significantly associated with receipt of disability benefits.

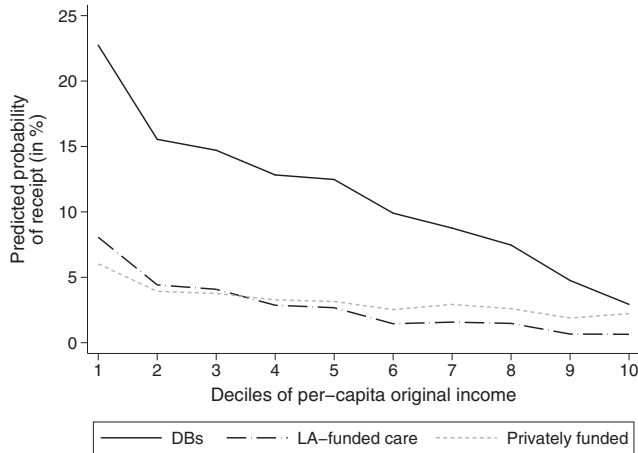
We find evidence of positive correlation between receipt of care services and disability benefits. The estimated cross-equation coefficients ρ_1 and ρ_2 are highly significant for both categories of care, suggesting there are indeed unobservable factors influencing receipt of both types of support. The correlation between disability benefit receipt and privately purchased care is slightly higher than the correlation between disability benefits and LA-funded care.

To aid interpretation of the estimated equations for receipt of care and benefits, Figures 2 and 3 plot how the average predicted probabilities of receipt of disability benefits and care vary according to predicted disability (\hat{d}) and original income (measured before disability and means-tested benefits) respectively. For this purpose, we group sample members into deciles of

³⁴Hancock et al., 2004.

FIGURE 3

Average predicted probabilities of care and disability benefit (DB) receipt by decile of income



predicted latent disability³⁵ and of income. Figure 2 illustrates three main points. First, predicted receipt of all forms of support is negligible in the lowest 30–40 per cent of the distribution of estimated disability but rises thereafter. Second, from the 30th to 40th percentiles of disability, predicted receipt of disability benefits starts to rise and increasingly exceeds predicted receipt of either publicly funded or privately purchased care. Third, predicted receipt of privately purchased care is higher than receipt of LA-funded care until somewhere between the ninth and tenth deciles so that it is only at the very highest disability levels that more people receive LA-funded care than purchase care exclusively privately. There is thus a very strong concentration of publicly funded care on those with the highest levels of disability.

As we would expect given the means test, predicted receipt of LA-funded care falls with income (Figure 3). A very striking feature of Figure 3 is the sharp fall in the average predicted probability of receiving disability benefits as income rises, despite the fact that disability benefits are not means tested. Also of note is the fall in predicted probability of purchasing care privately as income rises. Underlying both of these observations is the (negative) socioeconomic gradient of disability which is captured in the structural equations approach. In the case of privately purchased care, the restriction of LA-funded

³⁵For comparison, the median number of mobility (including strength and dexterity) difficulties and ADL limitations reported in the lowest 30 per cent of \hat{d} is 0. In the fourth and fifth deciles of \hat{d} , the median number of mobility difficulties reported rises to 1 and it rises to 2 (5) in the sixth (eighth) decile. In the tenth decile of \hat{d} , the median number of mobility difficulties reported is 8 (out of 10), whereas the median number of ADL limitations reported is 3 (out of 6).

care to those who not only have low means but also have high disability is likely to result in people with lower but still substantial levels of disability having to purchase care themselves. Given the socio-economic gradient of disability, they will typically have lower incomes and assets than those with no or low levels of disability.

In summary, we have found evidence of considerable targeting, by disability and income, of each of the two systems of public support for older people with disabilities. Our estimates predict that at all levels of disability and income, the probability of receipt of disability benefits is higher than that for LA-funded care. However, the rate at which that probability falls as income rises appears to be higher for disability benefits than for LA-funded care, despite the stringent means test for the latter and no means test for the former.

VI. Interpretation of results

In this section, we extend our use of the predicted disability levels and receipt of support to shed more light on the workings of the dual system of support for older people with disabilities.

Using the predicted disability level, \hat{d} , we can see that the observed rates of both care and disability benefits are zero below the fourth decile of disability (Figure 4). Sample members start to receive disability benefits at the fourth decile of disability, where receipt is about 3.5 per cent. No sample members

FIGURE 4

Observed rates of receipt of cash disability benefits (DBs), LA-funded care and both by decile of latent disability

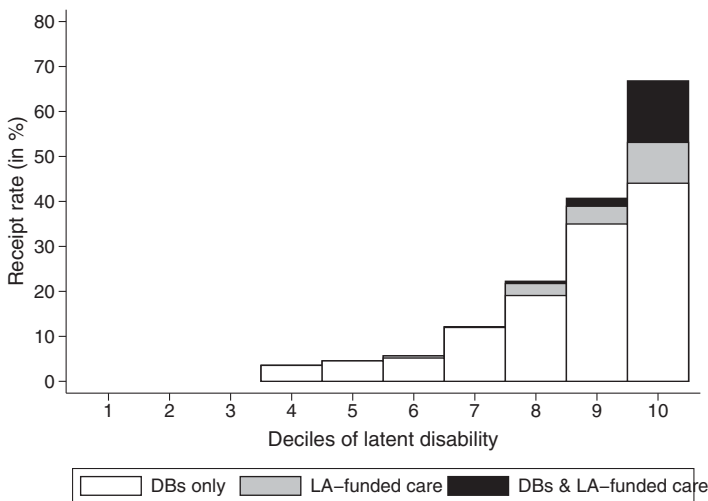
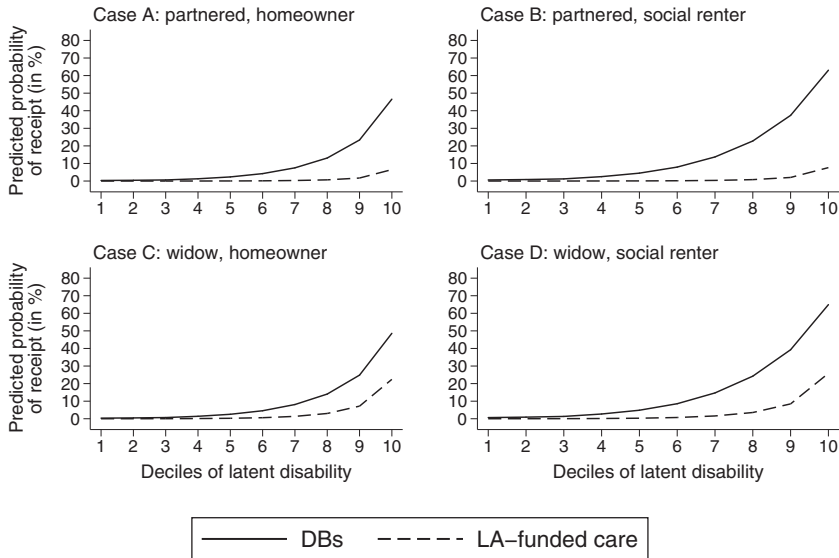


FIGURE 5

Predicted probabilities of cash disability benefits (DBs) and LA-funded care by level of disability for four illustrative 73-year-olds



report receipt of LA-funded care below the median level of disability, and at the median level just 0.4 per cent are recipients. Receipt of LA-funded care rises to about 3.2 per cent at the eighth decile of predicted disability. At that point, the observed rate of disability benefits is much higher, at about 19 per cent.

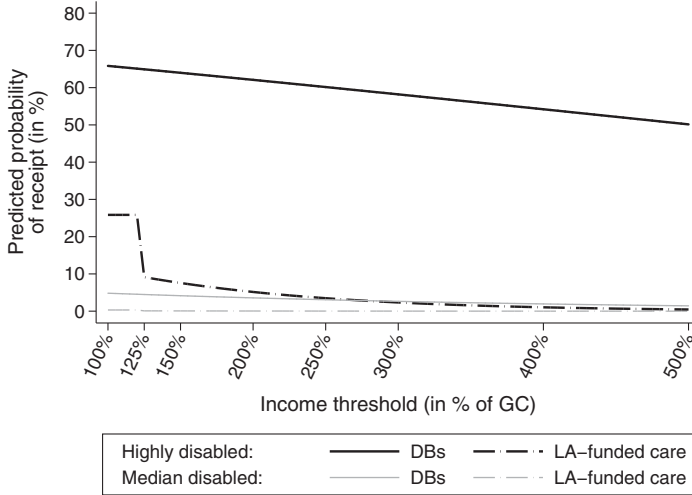
Each programme seems well targeted towards more disabled older people. Rates of receipt of each rise significantly in the top 20 per cent of disability. Within the 10 per cent most disabled individuals, the rate of receipt of disability benefits is 58 per cent and 23 per cent receive LA-funded care.

Given the stringent disability and means tests that apply to publicly funded social care, and the much higher overall rate of receipt of disability benefits, it is not surprising that relatively few recipients of disability benefits (around 11 per cent) also receive publicly funded care. A more surprising finding is that the proportion of recipients of publicly funded care who also receive disability benefits is under a half (49 per cent). Even among the 10 per cent most disabled people, only 60 per cent of the 23 per cent who receive publicly funded social care also receive disability benefits. Moreover, some 33 per cent of older people in the top 10 per cent of disability receive neither form of support.

In Figure 5, we compare the implications of the estimated models for four illustrative individuals aged 73 (the median age observed in the sample), for a spectrum of disability levels that correspond to the median values of \hat{d}

FIGURE 6

Predicted probabilities of cash disability benefits (DBs) and LA-funded care by income for a 73-year-old social renting widow



observed in each decile. Each of the individuals left school at 14, which was the minimum school-leaving age allowed at the time, with income and financial assets set at 125 per cent of the GC level and at the upper capital threshold respectively. Two of the cases are women living with their partners. One is a homeowner (case A) and one is a social renter (case B). The two other cases are widows living alone: a homeowner (case C) and a social renter (case D). A number of points emerge from these comparisons. First, other things equal, being a social renter increases the predicted probability of receiving disability benefits but has little effect on the probability of receiving LA-funded care. On the other hand, living alone has virtually no effect on the predicted probability of receiving disability benefits but does increase the probability of receiving LA-funded support.

In Figure 6, we examine how the estimated probability of receiving support varies by income level for a widow who is a social renter (case D above), with either a high or a median level of disability, corresponding to the median values of \hat{d} observed in the tenth and fifth deciles of its distribution. Below 125 per cent of GC, the predicted rates of receipt when disability is high are about 26 per cent for LA-funded care and approximately two-thirds for disability benefits. Because of the means test, the predicted probability of receiving LA-funded care drops sharply after the threshold of 125 per cent of GC, to close to zero. Despite the absence of a means test for disability benefits, their predicted rate of receipt also declines as income rises. The strict disability

test for publicly funded care means that predicted receipt is virtually zero at all levels of income when disability is at the median level. Predicted rates of disability benefit receipt are much lower than for the high-disability case but still fall slightly as income rises.

VII. Conclusions

Much of the previous literature on the design of disability programmes considers working-age adults, where labour market attachment is a primary concern³⁶ and is the focus of policy reforms. Instead, our interest here is in older people, typically well beyond retirement age, and in programmes that address care needs and the personal costs of disability, rather than act as earnings replacement.

This paper is motivated by the considerable policy debate on the respective roles of the English cash disability benefit and social care systems in providing help for older people with care needs, including suggestions for integrating the two systems. In November 2017, the UK government announced that it plans to consult on proposals to reform care and support for older people via a Green Paper. At the time of writing, this Green Paper is expected to be published in Autumn 2018.³⁷ This is the most recent in a long line of attempts to identify reform options for the English system of support for older people with care needs.³⁸ Any proposals for reform of the systems need to draw on good evidence on how well the current systems, taken together, are targeted on those in most need. In this paper, we have therefore investigated the targeting properties of the English two-part system of support for older people with disabilities. We have extended previous research in four ways. First, we consider both parts of the system, in contrast to previous research looking only at disability benefits³⁹ or only social care receipt.⁴⁰ Second, our statistical approach integrates the measurement of disability and its influence on receipt of each type of state support in a single framework, allowing for the socio-economic gradient in disability, whereas previous literature has used simple discrete indicators of disability and single-equation frameworks. Third, we have adopted definitions of income and wealth appropriate to each part of the statistical model. This may explain why we find significant income and wealth influences on receipt of publicly subsidised social care, where Vlachantoni

³⁶See, for example, Bound and Burkhauser (1999) and Burkhauser et al. (2014).

³⁷<https://www.gov.uk/government/speeches/secretary-of-states-oral-statement-on-the-nhs-funding-plan>.

³⁸Joseph Rowntree Foundation, 1996; Royal Commission on Long Term Care of the Elderly, 1999; Wanless, 2006; Department of Health, 2009; Commission on Funding Care and Support, 2011; Commission on the Future of Health and Social Care in England, 2014.

³⁹Zantomio, 2013; Hancock et al., 2015.

⁴⁰Vlachantoni et al., 2015.

et al. (2015) found none. Finally, we have also been able to exploit newly available data on social care collected in wave 6 (2012) of ELSA, which enable us to distinguish better between those who receive publicly subsidised care and those who pay the full cost of care.

We find that receipt of disability benefits and receipt of local-authority-funded care rise as disability increases (a finding consistent with previous research), with a strong concentration on those with the highest levels of disability, more so for LA-funded care than for disability benefits. The overlap between the two programmes occurs entirely among the most disabled population. It is striking that less than half of recipients of LA-funded care also receive a disability benefit, while amongst those in the top 10 per cent of the disability distribution, a third receive neither form of support. As we would expect given the means test, receipt of LA-funded care falls as income rises. As we have found in previous research using different data,⁴¹ there is also considerable income and wealth targeting of disability benefits, even though they are not means tested. This is explained partly by the socio-economic gradient in disability but is also likely to reflect claim behaviour. The scope for improving income/wealth targeting of disability benefits by means testing them, as some have suggested, is thus less than might be expected.

Under a two-part system, the chance of a disabled person being awarded at least some support is likely to be greater than that under a single system given the need to make a claim and the inevitable judgements involved by system administrators in disability assessment. The limited overlap in receipt of the two forms of support suggests that combining them into a single system risks increasing the already substantial proportion of the most disabled older people who receive neither form of support.

Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

- Appendix A
- Appendix B

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⁴¹Hancock et al., 2015.

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