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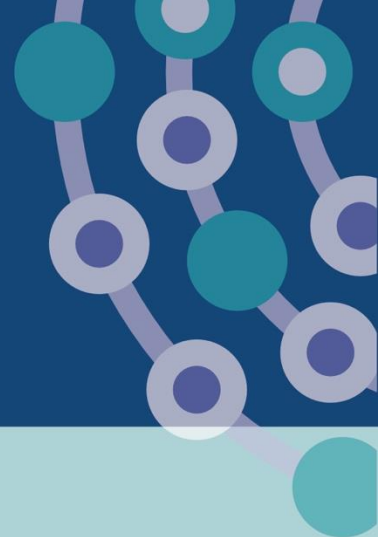
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# Wages and labour supply in the Adult Social Care sector

Florin Vadean, Stephen Allan and Hansel Teo

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**DISCLAIMER**

This NIHR Policy Research Unit (PRU) is part of the National Institute for Health and Care Research (NIHR) and hosted by the London School of Economics and Political Science in collaboration with the University of Kent and supported by King's College London.

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# **Wages and labour supply in the Adult Social Care sector**

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Acknowledgements:

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## 1. Introduction

England's population with long-term care needs is increasing rapidly due to population aging and the rise in life expectancy of people with physical and learning disabilities as well as mental health problems. The number of people with dementia, for example, is predicted to increase from about 750,000 in 2019 to about 1.35 million by 2040 (Wittenberg et al., 2019). Furthermore, while those aged over 65 constitute the majority of people supported by the Adult Social Care (ASC) sector in England, the demand for ASC services among the working-age population rose by about 10 per cent between 2015 and 2018, or over twice as fast than the older population with care needs (Atkins et al., 2019).

To meet the growing demand for care services, the number of ASC jobs increased by almost 30 per cent over the last 13 years (i.e., from 1.39 million in 2010 to 1.79 million in 2023) and is estimated to grow by another 25 per cent (approx. 440,000 jobs) by 2035 (Skills for Care, 2023a). However, the increase in demand for ASC workforce has been accompanied by lagged labour supply and high staff turnover. About 152,000 ASC jobs (or 9.9 per cent) were vacant in 2022/23, with most vacancies (89,000) being for care worker roles (i.e., frontline staff supporting people with care needs with all aspects of their daily living, like personal care, dressing, meals, etc.) (Skills for Care, 2023a). In addition, about 29.1 per cent of ASC staff in England left their job in 2022/23, with rates being higher in the independent care sector (about 30.4 per cent) and among care workers (36 per cent) (Skills for Care, 2023a).

Job vacancy rates in independent ASC sector in England increased by almost 50 per cent during 2021/22 and 2022/23 (Skills for Care, 2023a), reinforcing concerns about the sustainability of the sector and its capacity to meet increasing demand. While there seems to be consensus that the most likely factors related to low recruitment and retention in LTC in England are low pay levels (often at minimum wage), lack of status (as care work is not recognised as a profession), limited opportunities for career progression, and employment without guaranteed hours (i.e., so called zero-hours contracts) (Health Education England, 2017; Moriarty et al., 2018; National Audit Office, 2018; Taylor, 2018), there is limited evidence on what factors drive labour supply in ASC in England.

One of the few empirical studies on the determinants of job separations in ASC in England shows that retention could be improved by increasing wages and improving employment conditions (e.g., through full-time contracts and contracts with guaranteed working hours) (Vadean & Saloniki, 2023). Another study looking at competition in the ASC labour market in England found labour supply to the firm to be elastic, with a value of 4 (Vadean & Allan, 2023).

This paper builds on these studies by estimating wage elasticities of labour supply to the sector using data from 2016 to 2022 of the Adult Social Care Workforce Data Set (ASC-WDS), the main source of information for ASC workforce in England. As direct care staff are often employed on contracts without guaranteed working hours (i.e., zero-hours contracts), hours worked were in many cases not accurately captured. We therefore focus on the individual responses to wages with respect to entering/staying in the ASC labour force (i.e., the extensive margin). We find ASC labour supply in England to be elastic, with an overall value of 3.85. As this wage elasticity seems high compared to those found for other sectors and countries (Bargain & Peichl, 2016), and due to potential wage measurement issues for domiciliary care staff, the wage elasticity for residential care (1.80) could offer a more sensible estimate of the responsiveness of labour supply in the ASC sector. This would mean that a 1 per cent increase in wages, everything else being equal, would increase labour supply in the sector by almost 2 per cent. We discuss the effects of three different potential wage interventions in the sector on employment: a percentual wage increase across the wage distribution,

the introduction of a minimum wage to the sector, and the alignment of wages in ASC to NHS Agenda for Change Band 2 rates.

## 2. Methods

### 2.1 Wage elasticity of labour supply to the firm and wage elasticity of labour supply to the sector

According to Manning's Dynamic Monopsony Model, the wage elasticity of labour supply facing the firm can be broken into four parts: the wage elasticities of recruitment from, and separation into, employment and non-employment (Manning, 2003). If we further distinguish between employment inside and outside the sector, we get:

$$\varepsilon_{Nw} = \theta_R^{el} \varepsilon_{Rw}^{el} + \theta_R^{eo} \varepsilon_{Rw}^{eo} + (1 - \theta_R^{el} - \theta_R^{eo}) \varepsilon_{Rw}^n - \theta_s^{el} \varepsilon_{sw}^{el} - \theta_s^{eo} \varepsilon_{sw}^{eo} - (1 - \theta_s^{el} - \theta_s^{eo}) \varepsilon_{sw}^n \quad (1)$$

This shows that the wage elasticity of labour supply facing the firm ( $\varepsilon_{Nw}$ ) equals the weighted sum of the wage elasticity of recruitment from employment inside the sector ( $\varepsilon_{Rw}^{el}$ ), the wage elasticity of recruitment from employment outside the sector ( $\varepsilon_{Rw}^{eo}$ ), the wage elasticity of recruitment from non-employment ( $\varepsilon_{Rw}^n$ ), the wage elasticity of separation to other employment inside the sector ( $\varepsilon_{sw}^{el}$ ), the wage elasticity of separation to employment outside the sector ( $\varepsilon_{sw}^{eo}$ ), and the wage elasticity of separation to non-employment ( $\varepsilon_{sw}^n$ ). The weights are the respective shares of recruitment from each of the three sources ( $\theta_R$ ) and share of separations to each of the three destinations ( $\theta_s$ ).

Combining recruitment from employment outside the sector with recruitment from non-employment and separations to employment outside the sector with separations to non-employment, we get:

$$\varepsilon_{Nw} = \theta_R^l \varepsilon_{Rw}^l + (1 - \theta_R^l) \varepsilon_{Rw}^o - \theta_s^l \varepsilon_{sw}^l - (1 - \theta_s^l) \varepsilon_{sw}^o \quad (2)$$

where  $\varepsilon_{Rw}^o$  denotes the wage elasticity of recruitment from sources outside sector and  $\varepsilon_{sw}^o$  the wage elasticity of separation to destinations outside the sector.

The steady-state assumption implies that the overall flows of staff separation and recruitment are equal and the wage elasticity of labour supply to the firm can be approximated with minus two times the overall wage elasticity separation ( $\varepsilon_{Nw} = \varepsilon_{Rw} - \varepsilon_{sw} = -2\varepsilon_{sw}$ ) (Manning, 2003). The flows of recruitment and separations within the sector are in this case also equal (or  $\theta_R^l = \theta_s^l$ ), and the recruitment elasticity from employment inside the sector would equal the negative of the separation elasticity to employment inside the sector ( $\varepsilon_{Rw}^l = -\varepsilon_{sw}^l$ ). We can, therefore, re-write Equation 2 as:

$$\varepsilon_{Nw} = -2\theta_s^l \varepsilon_{sw}^l + (1 - \theta_s^l)(\varepsilon_{Rw}^o - \varepsilon_{sw}^o) = -2\varepsilon_{sw} \quad (3)$$

where  $(\varepsilon_{Rw}^o - \varepsilon_{sw}^o)$  represents the wage elasticity of labour supply facing the sector. This can be expressed in terms of the overall wage elasticity of separation, the wage elasticity of separation to other employment inside the sector and share of separations to employment inside the sector:

$$(\varepsilon_{Rw}^o - \varepsilon_{sw}^o) = \frac{-2\varepsilon_{sw} + 2\theta_s^l \varepsilon_{sw}^l}{(1 - \theta_s^l)} \quad (4)$$

## 2.2 Empirical analysis

Our starting point for the estimation of wage elasticities of job separation is the discrete time proportional hazard model proposed by (Jenkins, 2005). With job tenure grouped into years, the discrete hazard of the job spell  $i$  to end during the tenure-year  $t$  (that starts at  $T_k$  and ends at  $T_{k+1}$ ) is:

$$h_{it} = \Pr(T_k < t \leq T_{k+1} | x_{ijt}, t > T_k) = 1 - \exp \left\{ - \int_{T_k}^{T_{k+1}} \lambda_d(t) dt \times \exp(x_{it} \beta_{PH}) \right\} \quad (5)$$

where  $(\lambda)$  is the baseline hazard, allowed to be piece-wise constant over the tenure periods  $(d)$ . The cumulated baseline is multiplied by an exponentiated scalar including a vector of covariates affecting employment  $(x_{it})$  and their respective parameters  $(\beta_{PH})$ . The discrete time proportional hazard model is estimated by complementary log-log regression in Stata 17.0, with the Huber-White sandwich estimator used to obtain cluster-robust standard errors.

An important challenge in estimating wage elasticities of separation is related to the adequate control for other relevant factors in  $x_{it}$  besides the log of wages. Following our previous studies on determinants of job separation in (Vadean & Saloniki, 2023) and wage elasticities of labour supply to the firm in LTC (Vadean & Allan, 2023), the covariates included are: a) a set of individual factors that can be associated with the likelihood of job separations (i.e., age, gender, ethnicity, and qualifications); b) a set of job and employer related characteristics, like job role, training incidence, employment without guaranteed working hours, sector (i.e., public, for-profit, and not-for profit), user type (i.e., younger adults, older people, and mixed), employer size, staff per service user ratio (as proxy for workload), vacancy rate, the turnover rate for the past 12 months to capture any potential ‘herd’ effect with respect to separations, and the national health and care regulator’s rating of the management (i.e., Care Quality Commission (CQC) rating on ‘Well-led’); and c) local market characteristics, like the local unemployment rate, the log of the 1<sup>st</sup> quartile of the local wage distribution (as proxy for peer wages in alternative employment), the geometric mean of local house prices (as proxy for demand of self-funded care), the ASC tariffs paid by local councils (as proxy for demand of publicly funded care), and competition in the local ASC market.

The above variables have been found to be significant factors in previous studies, with job separations and/or staff turnover in long-term care shown to be related to job characteristics (e.g., tenure, training provision, job benefits and rewards, and work overload/stress) (Castle et al., 2007; Gaudenz et al., 2019; Karantzas et al., 2012; Morris, 2009; Park et al., 2017; Rosen et al., 2011), employer characteristics (e.g., employer’s size, lower staffing levels, guaranteed working hours, for-profit ownership, and home care provision) (Castle, 2008; Castle & Engberg, 2006; Kennedy et al., 2020, 2021), management style and work environment (e.g., support from supervisors and co-workers, autonomy over tasks and/or not asking staff for input in decision making) (Donoghue & Castle, 2009; Gao et al., 2014; Gaudenz et al., 2019; Ha et al., 2014; Karantzas et al., 2012), as well as local market factors (e.g., unemployment, wages in alternative jobs in the local area, and competition) (Castle, 2008; Donoghue, 2010; Morris, 2009).

Although found in previous studies to be significantly related to the likelihood of job separation, we did not include ‘full-time/part-time employment’ as covariate, as it can be itself an outcome of wages and affect the relationship between wages and job separation.

Many factors related to job performance and separations (e.g., workers’ job commitment and motivation, organisational culture, etc.) are not observed in survey data. Not suitably controlling for unobserved factors is known to bias the separation elasticity towards zero, even if uncorrelated with

wage (Manning, 2003). Accounting for either correlations between job spells of the same worker (i.e., shared frailty) or individual random effects has been shown to have only small bias correction effects (Vadean & Allan, 2023; Vick, 2017). On the other hand, a quasi-experimental study exploiting responses to arbitrary wage differences in own and peer wages using regression discontinuity (Dube et al., 2019) and a study that isolated the wage component determined by firm wage policy from individual wages (i.e., the component not related to worker heterogeneity) (Bassier et al., 2022) have both identified separation elasticities of -1.4 to -2.1 and about three to four time larger than those from studies using the ‘traditional model’. Using panel data and Mundlak-type ‘within’ estimates, (Vadean & Allan, 2023), obtained wage separation elasticities of similar magnitude.

As in (Vadean & Allan, 2023), we use correlated random effects (CRE) probit to account for unobserved effects. This is a quite flexible estimator for binary settings, including among covariates the average over time of the time-varying covariates ( $\bar{z}_i$ ) to remove the time-invariant unobserved heterogeneity associated with the explanatory variables ( $x_{it}$ ). The parameters  $\beta_{CREprobit}$  are Mundlak-type ‘within’ estimates similar to those from a fixed-effects estimator but allowing the estimation of average partial effects (i.e., marginal effects) and elasticities (Wooldridge, 2010).<sup>1</sup> The probability of job spell  $i$  to end during the tenure-year  $t$  is:

$$\Pr(h_{it} = 1|x_{it}, u_i) = \Phi(x_{it}\beta + u_i) = \Phi(x_{it}\beta_{CREprobit} + \bar{z}_i\xi + a_i) \quad (6)$$

where  $a_i$  is assumed to be independent from  $x_{it}$ . Most unobservables ( $u_i$ ) are time invariant (or change very little over time) and, thus are captured by  $\bar{z}_i$ . Nonetheless, if they would change over time in a deterministic way, they would be captured by the included year dummies. We estimated CRE probit by pooled probit, with the Huber-White sandwich estimator used to obtain cluster-robust standard errors. We also estimated wage elasticities using a simple pooled probit to illustrate differences in findings between controlling and not controlling for unobserved characteristics, as well as for comparison to the traditional estimation of the discrete time proportional hazard model by complementary log-log regression.

Wages in  $x_{it}$  are log transformed. We, therefore, obtain wage elasticities of separation by estimating semielasticities after the cloglog, probit and CRE probit:

$$\text{eydx}(\quad) = d(\ln h)/d(\ln w) = \beta_{\ln w} \times (1/h) \quad (7)$$

where  $h$  is the job separation rate, and  $\ln w$  is the log of wages.

### 3. Data

The data used is from the Adult Social Care Workforce Data Set (ASC-WDS), the main source of workforce intelligence for the ASC sector in England, including over 700,000 workers in over 20,000 care establishments and, thus, covering about 50 per cent of the ASC market. Information is provided by employers on both establishment characteristics (e.g., type of service provided, sector, establishment size, count of employees and job roles, starters, leavers and vacancies, etc.) and workers (e.g., age, gender, nationality, qualifications, training, pay, working hours, job role, job type, etc.). Public employers provide data on a mandatory basis in September each year, while independent employers provide data on a voluntary basis, and are incentivised through access to workforce development grants. All data in the ASC-WDS is updated or confirmed to be up to date

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<sup>1</sup> The vector of variables  $x_{ijt}$  includes time-variant, time-invariant (e.g., gender) as well as time-dependent variables (e.g., age and tenure).



within the last two years, with about 80 per cent of employers in the ASC-WDS sample having updated their data in the past six months. ASC-WDS data has been validated at source and has undergone rigorous data quality checks. Despite not covering all independent sector establishments, the dataset has a large enough sample to provide a solid basis for reliable workforce estimates at both national and local level (Skills for Care, 2023a).

We included seven annual cuts from the dataset (Oct 2016 to Oct 2022), matched at individual level. Establishments and workers have each unique and permanent IDs. We excluded employees from all establishments with records not updated within the last six months and establishments with missing IDs for more than 25 per cent of their workers. We included establishments offering either domiciliary care or care home services (with or without nursing) to adults (i.e., people aged 18 and over), and being owned by either public (i.e., statutory local authority), private (i.e., for-profit) or voluntary (i.e., not-for-profit) sector care providers. Employees were included in the sample if aged between 16 and 59 (i.e., employees close to state retirement age excluded) and in a direct care role (i.e., care workers [85 per cent], senior care workers [11 per cent], and other care providing roles, e.g., community support and outreach and activity workers [4 per cent]). We excluded observations for workers without a unique ID (as these cannot be traced over time; 7 per cent), for those who erroneously had multiple entries per year with the same establishment (1 per cent), and for workers with two or more jobs in any year (6 per cent).

Job transitions inside ASC were identified as a dummy variable equal to '0' if the employee was still with the same employer one year later ( $t + 1$ ) and equal to '1' if the employee could be identified as working for another ASC employer in the sample at  $t + 1$ . On the other hand, overall job separations were defined as a dummy variable equal to '0' if the employee was still with the same employer one year later ( $t + 1$ ) and equal to '1' if either: a) the employee could be identified as working for another ASC employer in the sample at  $t + 1$ ; or b) the employee left the sample at  $t + 1$ , but their employer at time  $t$  was still in the sample. For a small number of employees information was missing at  $t+1$ , but we could use the information from a subsequent year to identify the job separation status. Employees for whom the job separation status could not be identified because both they and their initial employer dropped from the sample in all subsequent years, were excluded from the analysis (about 14 per cent).

The final sample consisted of 308,581 observations (job-spell-years) of 153,831 job-spells of 146,829 direct care staff employed in 6,401 care homes, and 237,185 observations (job-spell-years) of 121,159 job-spells of 116,057 direct care staff employed by 2,822 domiciliary care establishments; see Table 1. In line with national reports (Skills for Care, 2022), a large number of job spells in our sample ended with a job separation: 32.5 per cent in residential care and 34.4 per cent in domiciliary care. Out of these job separations we could identify only about 25 per cent to be transitions to other jobs in ASC. This is substantially lower than the about 60 per cent share of recruits from other ASC care jobs; see also (Skills for Care, 2023a). The difference is, however, due to the fact that the destination of job leavers that left the ASC-WDS sample could not be identified, as the dataset covers only about half the ASC market.

We assessed the national representativeness of the establishments in the analysed sample by comparing establishment characteristics (i.e., sector, care home service type, care home capacity, quality rating, and regional distribution) with those of all adult ASC establishments regulated by the Care Quality Commission (CQC); see Appendix, Table A1 and Table A2. Our sample slightly overrepresented publicly owned establishments, care homes with nursing, care homes with slightly larger capacity (i.e., care home beds) as well as establishments with better CQC quality rating. Post sampling raking weights were generated for each establishment (and year) using control totals

obtained from the CQC care directory data, so that the weighted averages of the analysed sample matched the average characteristics of all establishments in England.

## 4. Results

### 4.1 Descriptive statistics

To remove outliers, we winsorised wages for each sector and year at the 5<sup>th</sup> and 99<sup>th</sup> percentiles. The distribution of wages in ASC in 2016 compared to 2022 by sector and care setting are presented in Figure 1. The box plots illustrate a rather substantial difference in wages between sectors in 2016, with substantially higher wages in the public sector. The median wage for direct care workers in residential care was £9.12 in the public compared to £7.25 in the private sector (i.e., 27 per cent difference) and £7.70 in the voluntary sector (i.e., 18 per cent difference). In domiciliary care median wages were slightly higher, some providers including compensation for travel time: £9.56 in the public sector, compared to £7.50 in the private sector (i.e., 27 per cent difference) and £7.77 in the voluntary sector (i.e., 23 per cent difference). Probably due to the substantial increase in the minimum wage floor during that period, the pay gap between public and independent providers has diminished by 2022 to only about 7 per cent in both residential and domiciliary care.

Looking at kernel distributions of hourly wages of direct care workers employed in the private and voluntary sector in 2016, 2018, 2020 and 2022 (see Figure 2), we note the wage distribution did not compress but rather widened during the period. In particular in 2022, we see less direct care workers paid at (or below) the National Living Wage (NLW) of £9.50, and further (smaller) peaks at £10.00, £10.50, and £11.00. More providers seem to have offered higher pay in recent years, probably to increase retention and as a response to increasing number of vacancies in the wake of the COVID-19 pandemic. This may have been made possible through grants allocated to local councils to support recruitment and retention in the sector (e.g., the Workforce Recruitment and Retention Fund). Care providers will, however, be unlikely to sustain this higher pay rates without continued support from local (and central) government. Another explanation might be that care providers recruiting from abroad to fill vacancies have to pay higher wages after the implementation of the new immigration system in 2021. Although care workers were included in 2022 on the list of shortage occupations, recruits from abroad have to be paid an hourly wage of £10.75, which was above the 2022 NLW of £9.50. For providers recruiting from abroad, this may have had a positive spillover effect on the pay of other, already employed, care workers as well.

The large differences in wages between sectors are also reflected in job separation rates; see Table 2. Pooled data from our analyses sample 2016-2021, shows an about 50 per cent higher job separation rate in the private compared to the public sector. Geographically though separation rates seem to be less related to wages, and lower in the more deprived North East region (e.g., higher unemployment and inactivity rates) and higher in the South East and South West, where care workers likely have more outside job opportunities (i.e., relatively higher job density and lower unemployment rates).

We do not know the share of separations that are to other ASC jobs. However, we approximate that in the calculations of wage elasticities to the sector with the share of recruitment from ASC. Overall, this is about 60 per cent (see Table 1) but with large variation between sectors as well as geographically. LA employers seem to be more successful in recruiting direct care staff previously employed in ASC jobs (84 per cent), probably due to the better pay and conditions offered, compared to a rate of only 59 per cent for private and 63 percent for voluntary sector employers. Geographically, the transitions between ASC jobs seem to be more prevalent in the Northern regions

where ASC workers have less outside job opportunities. In particular the North East, where the number of jobs per working age person (i.e., job density) is the lowest in England.

In the regression analysis, financial variables (e.g., house prices and ASC tariffs paid by local authorities) are inflation adjusted to £2022 prices, using the CPI index. For hourly wages, we used as inflation index the increase in NLW. This is because for low-wage jobs in ASC and other sectors (e.g., retail, hospitality, and cleaning), pay is more likely to be indexed to or determined by the statutory NLW. Moreover, ASC worker decisions on whether to join or leave the sector would be rather based on wage differentials to competing occupations than on purchasing power. By applying the increase in NLW as inflation index, we also got a much closer overlap in the yearly distribution of wages (see Figure 3), which is likely more appropriate for predicting employment effects on wages for the year 2022 (see Section 5).

The scatterplots in Figure 4 illustrate a negative relationship between wages and the probability of job separation in the cross-section. One exception is private sector domiciliary care for which the relationship is not conclusive. This might, however, be due to a wage measurement issue. Some of the observed variation in wages between domiciliary care workers may not reflect real differences in wages, but rather differences in the way care providers compensate for travel time, with some paying higher hourly wages but for client contact time only. In this case we would observe higher wages associated with higher probability of job separation, if wages adjusted for travel time (i.e., taking in account all time spent at work) are low.

## 4.2 Wage elasticities of labour supply

### 4.2.1 Wage elasticities overall

Estimated wage elasticities of overall job separation, of separation to other jobs in ASC, and of labour supply to the sector by care setting are reported in Table 3. Consistent with findings from previous studies (Bassier et al., 2022; Dube et al., 2019; Vadean & Allan, 2023) the wage elasticities of separation were significantly higher when controlling for unobserved factors (i.e., CRE probit estimations), and with the overall separation elasticities of similar magnitude as in these previous studies: -2.18 to -2.54, depending on care setting. F-test of joint statistical significance of  $\bar{z}_{ij}$  from the CRE probit estimations ( $\chi^2$  value of 48,565 [p-value<0.001] for overall separations, and 19,415 [p-value<0.001] for separations to ASC jobs; see Table Appendix, Table A3) showed that the ‘within’ CRE probit estimates were to be preferred.

The wage elasticities of labour supply to the sector are calculated using Equation (4) and the respective estimated wage elasticities of separation and the share of recruitment from ASC jobs, with the share of recruitment from inside the sectors considered to be equal to the share of separations to jobs inside the sector in the steady state. Standard errors and confidence intervals have been obtained by bootstrapping (with 100 replications). The steady state assumption implies that the flow of recruits equals that of separations. Support for that is provided in Figure 5, which shows that firm-level separation and recruitment rates fall broadly along the 45-degree line.

The estimated overall wage elasticity of labour supply to the sector is 3.85, meaning that labour supply to the sector is elastic with respect to wages. Everything else being equal, at sample mean (i.e., hourly wage of £10.11) a 1 per cent increase in real wages would increase the labour supply to the sector by 3.85 per cent.

### 4.2.2 Wage elasticities by care setting

When estimating wage elasticities of labour supply (with unobserved heterogeneity bias correction) separately by care setting, we get a lower elasticity of labour supply to the sector in residential care

(1.80) and a higher one in domiciliary care (5.35). We also note that the bias correction was smaller in the residential care setting: the estimated wage elasticity of labour supply without bias correction was around 1. In domiciliary care, the wage elasticity of labour supply was negative and significant (-0.7) without bias correction, which is conflicting with expectations of increasing employment when wages increase. This unexpected estimate for domiciliary care might be due to measurement issues with respect to individual hourly wages discussed in Section 4.1. We may observe some domiciliary care workers receiving higher wages (but only for client contact time) having a higher likelihood of leaving their jobs, as their *actual* hourly wages (when travel time is taken into account) are lower than observed. These would explain the relatively lower wage elasticities of separation and the negative wage elasticities of labour supply in domiciliary care (when not controlling for unobserved factors). The bias correction using CRE probit estimation turns the wage elasticity of labour supply positive (as theoretically expected to be), but of rather high magnitude. On the one hand, the high wage elasticity of labour supply to the sector in domiciliary care could be associated with lower effective wages when travel time is taken into account and the increased income insecurity, due to the high share of workers on zero-hours contracts. On the other hand, it could be related to the measurement issue of hourly wages. For example, if the bias in the estimated separation elasticity to jobs inside ASC (which is obtained from a smaller sample) was corrected to a lesser extent than the estimated separation elasticity to jobs overall, the high wage elasticity of labour supply to the sector for domiciliary care could be the result of the lower (and still biased) separation elasticity to jobs inside ASC. We, therefore, suggest that estimated wages elasticities for domiciliary care should be interpreted with care.

#### 4.2.3 Wage elasticities by age and experience

Stratified estimations of wage elasticities of labour supply to the sector, for the two care settings combined, do not show substantial differences between age groups; see Table 4. Despite wage elasticities of separation being highest at younger age (-2.84 overall and -3.69 to jobs inside ASC at age 16 to 29) and lowest at age 45 to 59 (-2.26 overall and -2.59 to jobs inside ASC) (which may be mainly related to the increase in wages with age), the wage elasticity of labour supply to the sector is highest at age 30 to 49 (4.29) but only moderately lower at age 16 to 29 (3.65) and age 45 to 59 (3.40). Notable differences between care setting are for older direct care workers (aged 45-59), with wage elasticities insignificantly different from zero for residential care workers. This could be due to older workers being less likely to leave (or join) the ASC sectors out of pecuniary reasons, and other reasons such as health issues (e.g., burnout) or informal care commitments becoming more prevalent.

On the other hand, wage elasticities of labour supply vary more considerably between groups with different work experience in the sector (see Table 5): the wage elasticity of labour supply to the sector is not significantly different from zero for the direct care workers with less than 2 years of experience, but increases to about 3 for those with 2 to 4 years of experience and over 5 for those with 5 to 9 years of experience in ASC, before falling again to insignificantly different from zero for those with more than 10 years of experience. This probably shows that most workers joining the sector are less motivated by wages, most likely being aware of the low pay levels. A potential explanation from a 'search and matching' perspective would be that many probably only try out a caring job role and leave when realising it is not a good fit for them, irrespective of pay. Another explanation is that new sector entrants may treat their first years of employment in ASC as a period of human capital accumulation, and therefore forgo lower current for higher future reservation wages. The human capital accumulation argument would also explain the higher wage elasticities of labour supply (over 2) that we observe for care staff with 2 years of more experience in ASC. Wage elasticities of labour supply drop, however, to insignificantly different from zero for direct care staff

with most experience (i.e., 10 years or more), probably with many in this group highly motivated to work in the sector and more likely to change to other ASC jobs than to leave the sectors (i.e., relatively higher wage elasticities of job separation to jobs inside ASC). This group may also include more workers closer to their end of careers and likely leaving the ASC sector motivated by nonpecuniary factors (e.g., health/burnout or informal care responsibilities), as observed for residential care workers aged 45 to 59.

#### 4.2.4 Wage elasticities by rural/urban area and region

Looking at wage elasticities of labour supply in urban vs. rural areas (see Table 6), we get rather similar wage elasticities of labour supply to the sector of 3.74 and 3.45, and therefore, no confirmation that more job opportunities in urban areas would lead to a higher response to wages.

Regionally, we found that labour supply to the sector in residential care is more responsive to wages in the North and South, while in domiciliary care more responsive to wages in the Midlands and South; see Table 7.

#### 4.2.5 Wage elasticities by year

We could not run CRN probit panel data estimations stratified by year. We, therefore, estimated wage elasticities of job separation by year from interactions between wage and year. We expected though that effects of other covariates vary by year as well and included further interactions between year and training incidence, employment on zero-hours contract, sector, employer level staff turnover during the previous 12 months, employer CQC rating with respect to 'Well-led', the 1<sup>st</sup> quartile of the local area wage distribution, and region. We found wage elasticities of labour supply to the sector were higher before the pandemic and decreased substantially in 2020 and 2021; see Table 8. This is not surprising, as direct care workers had substantially less job opportunities outside the sector during the pandemic, with the labour demand in the retail and hospitality sectors negatively affected, and workers from other sectors looking for jobs in social care during these years despite the low wages.

## 5. Impact of wage increases on employment

Based on the estimated wage elasticities, we aimed to determine predicted labour supply effects from a change in wages. We considered different potential scenarios: a percentual wage increase; the introduction of a sector specific minimum wage; and increasing wages to match NHS Agenda for Change rates.

### 5.1 Percentual increase in wages

First, we looked at a percentual increase in wages across the distribution. To account for a potential non-linear effect (i.e., the wage elasticity is expected to decrease with wage), we considered a percentual increase in employment to equal the average wage elasticity (between initial and new wage level) multiplied by the percentual increase in wages:

$$\frac{\Delta h}{h} = \bar{\varepsilon} \times \frac{\Delta w}{w} \quad (8)$$

Table 9 presents effects of wage increases of 2 per cent and 5 per cent respectively from the sample mean of £10.11, with respective wage elasticities of labour supply and predicted effects on employment in the ASC sector. The probit estimation with log transformed wages implied that the resulting the wage elasticities of separation were monotonic in wage. For comparison, also estimated a model with a 3-degree polynomial of wages. In this model, as expected, the wage elasticities of separation and the wage elasticity of labour supply are decreasing with the wage level.

Our predictions show that everything else being equal (e.g., wages in other sectors competing for the same workforce, like retail trade or hospitality, are considered constant) a 2 per cent increase in real wages is associated with an about 8 per cent increase in ASC employment, while a 5 per cent increase in real wages is associated with an about 20 per cent increase in ASC employment.

As the estimated wage elasticities of labour supply to the sector are potentially biased due to wage measurement issues in domiciliary care, we alternatively predicted employment effects for the whole ASC sectors using wage elasticities obtained for the residential care setting only (see second section of Table 9). The predicted employment effects are more moderate, with a 2 per cent increase in real ASC wages (and everything else being equal) related to a 4.5 per cent increase in ASC employment, a 5 percent increase in real ASC wages related to an about 11.5 percent increase in ASC employment. Predictions with wage elasticities of separation for residential care with a 3-degree polynomial in wages are even smaller: a 3.4 and 9.2 per cent increase in ASC employment for a 2 and 5 per cent increase in real wages, respectively.

## 5.2 Introducing an ASC sector specific minimum wage

We also considered the scenario of a wage increase in the ASC sector though the introduction of an ASC specific minimum wage. For this we considered increases in the minimum wage floor by 50p increments. Assuming that wages are evenly distributed between increments, the percentual increase in labour supply ( $\frac{\Delta h}{h}$ ) for a wage floor increase of  $k$  50p wage increments equals the weighted sum of the percentual increase in wage from increment  $n$  to the next ( $\frac{\Delta w_n}{w_n}$ ) times the average wage elasticity of labour supply between wage increments  $n$  and  $n + 1$ ; the weights being the cumulated share of workers paid below increment  $n$  plus half the share of workers paid between increments  $n$  and  $n + 1$  ( $\frac{(\sum h_n) + 0.5h_{n+1}}{h}$ ):

$$\frac{\Delta h}{h} = \sum_n \left( \bar{\varepsilon}_{n,n+1} \times \frac{\Delta w_n}{w_n} \right) \frac{(\sum h_n) + 0.5h_{n+1}}{h} \quad (9)$$

Table 10 presents wage elasticities of separation and of labour supply at £9.50, £10, and £10.50, the share of workers paid between wage increments and the cumulated share of workers below each increment in 2022, the percentual overall payroll increases for introducing a (hypothetical) sector specific minimum wage at £10 and £10.50 respectively, and the respective predicted percentual increases in employment. More detailed information on wage elasticities of separation and of labour supply on wages from £9.00 (i.e., close to the 10<sup>th</sup> percentile of the wage distribution) to £11.50 (i.e., close to the 90<sup>th</sup> percentile) by age group and care setting are presented in the Appendix, Table A4.

As only workers paid below the new minimum wage are affected by the wage floor increase (i.e., we assume no wage spillovers to higher wages), an ASC minimum wage 50p higher than the 2022 National living Wage (NLW) of £9.50 is affecting only the wages of about 45 per cent of direct care workers paid below £10. The minimum wage floor increase of 5.3 per cent translates into a 1.6 per cent overall (real) wage (i.e., cost) increase across all direct care workers and leads to an employment increase of 6.1 percent. Similarly, an ASC minimum wage £1 higher than the 2022 NLW of £9.50, would lead to a 4.5 per cent overall (real) wage (i.e., cost) increase across all direct care staff and an employment increase of 17.3 per cent.

The results are quite similar when using elasticities estimated with the 3-degree polynomial of wages, instead of the log of wages. However, as for the percentual increase in wages, we get more moderate employment effects when we apply the wage elasticities obtained for the residential care setting to employment predictions for the overall ASC sector (see second section of Table 10). In this



case, an ASC minimum wage 50p higher than the 2022 NLW (i.e., 1.6 per cent wage increase across all direct care workers) would lead to a 2.2 to 3.5 per cent increase in employment (dependent of using the 3-degree polynomial of wages or log transformed wages for estimating wage elasticities), while an ASC minimum wage £1 higher than the 2022 NLW (i.e., 4.5 per cent wage increase across all direct care workers) would lead to a 7.1 to 9.8 per cent increase in employment (again dependent on the model used to estimate wage elasticities).

### 5.3 Increasing wages in ASC to NHS Agenda for Change wages

Another suggestion for improving pay in the ASC sector was to align care workers hourly rates to NHS Agenda for change Band 2 rates. For simplicity we have not considered Higher Cost Area Supplements (HCAS) for staff living in London, but only the basic rates for 2022 of £10.37 for staff with less than 2 years experience, and £10.90 for staff with 2 or more years experience in the sector. Increasing wages in ASC to Agenda for Change wages is equivalent to introducing a minimum wage for the sector. We, therefore, used the same approach of considering wages being evenly distributed between pay increments, and determined the effects on employment using Equation 9. The wages elasticities, share of workers by experience and wage level as well as the respective predicted employment effects are presented in Table 11.

An increase in wages for the about 11 percent of direct care workers with less than 2 years of experience in ASC and having being paid less than £10.37 in 2022 would increase overall (real) wages (i.e., costs) by 0.5 per cent, but would have no effect on employment, as the wage elasticity of labour supply for this group is not significantly from zero (see also Table 5). On the other hand, an increase in wages for the almost 70 per cent direct care staff with 2 or more years of experience in ASC and being paid under the Agenda for Change hourly wage of £10.90 in 2022 would increase overall (real) wages (i.e., costs) by 6.5 per cent and (everything else being equal) employment in ASC by about 25%. The more cautious approach of using wage elasticities of labour supply obtained for residential care settings predicted an employment increase of between 7.4 to 13.1 per cent.

## 6. Discussion

The aim of this study was to provide estimates of the labour supply responsiveness to wages (i.e., wage elasticities of labour supply) in the ASC sector in England, a sector under increased pressure to find solutions to increase supply to meet the steadily increasing demand for services due to population aging (Atkins et al., 2019; Wittenberg et al., 2019). With the sector facing a large number of job vacancies (152,000 in 2022/23) there are arguments for the need of increasing the rather low pay levels in the sector to attract more workers (Skills for Care, 2023a). However, there is little evidence (if any) to the employment effects that could be expected from wage increases. We aimed to provide a first attempt to fill this gap, by estimating wage elasticities of labour supply of participation in the ASC labour force (i.e., extensive margin).

We used data from ASC-WDS, a large workforce dataset provided by Skills for Care and the main source of information on ASC workforce in England. We found wage elasticities of labour supply to the sector in ASC in England to be elastic, with an overall point estimate of 3.85. This shows that assuming everything else is being kept constant (i.e., including the wages in sectors competing for low pay workforce with ASC employers), a 1 per cent increase in real wages (i.e., zero inflation) may increase ASC employment by almost 4 per cent. Wage elasticities of labour supply of this magnitude would seem high, with international evidence of the distribution of wage elasticities of labour supply for women between 0 and 1.5 (Bargain & Peichl, 2016). Nonetheless, as a sector with female dominated employment and pay among the lowest in England, we would expect wage elasticities to be somewhat higher. Moreover, these high wage elasticities were obtained by using econometric

methods which offered substantial unobserved bias correction, and our related wage elasticities of job separation were of similar magnitude to those from studies dealing with unobserved heterogeneity by using quasi-experimental design or isolating the wage component determined by firm wage policy from individual wages (Bassier et al., 2022; Dube et al., 2019).

A remaining source of bias in our overall estimates could be related to measurement issues of hourly wages in domiciliary care. There is anecdotal evidence that some domiciliary care providers pay higher hourly wages but only for client contact time. However, care staff would base their decisions to move between jobs based on hourly pay for the whole time spent at work (i.e., including travel time). The mean hourly wage for domiciliary care workers in our analysed sample is somewhat higher than that for residential care workers, but not that high to imply that all domiciliary care employers pay for contact time only, and suggesting that some employers declare lower wages but including for travel time. As such, we assume that the ASC-WDS includes a mixture of registered hourly wages for domiciliary care workers, some covering travel time while some not, making the identification of the effect of hourly wages on job separations in domiciliary less reliable. We believe this to be the reason why we obtained negative wage elasticities of labour supply to the sectors (around -0.70) for domiciliary care when not controlling for unobserved factors. Correcting for unobserved heterogeneity bias turned the wage elasticities of labour supply positive, but of rather high magnitude (5.35). We, therefore, suggest considering the wage elasticity estimates for the residential care setting (1.80) as more likely reflecting the response of employment to wage changes in the ASC sector as a whole. We focus mainly on these in the following discussion.

Wage elasticities of labour supply by experience in ASC show that taking up a job in the sector (i.e., experience less than 2 years) is less related to pay. A potential argument from a 'search and matching' perspective could be that, due to low entry requirements, many sector entrants try out care jobs without having a strong motivation of working in ASC and, therefore, those finding ASC jobs do not to match their expectations are not swayed to stay by higher wages alone. This would highlight the importance for care providers to select candidates with the right values, behaviour and attitude to reduce turnover of new recruits to the sector (Skills for Care, 2023b). An alternative explanation would be that new sector entrants may perceive their first years of employment in ASC as a period of human capital accumulation. This would imply lower reservation wages while accumulating skills and experience and higher future reservation wages. This argument would also explain the higher wage elasticities of labour supply (over 2) that we observe for care staff with 2 to 9 years of experience in ASC. The inelastic labour supply for direct care staff with 10 or more years of experience could be due to other factors becoming more relevant in the motivation of leaving the sector (e.g., health issues, burnout, care responsibilities in the family, etc.) or staying (i.e., a strong motivation to work in a care job or strong bonds with the persons cared for) after a certain age (e.g., over 45).

Geographically, we found, as expected, labour supply to be more responsive to wages in the South of England, where economic activity and job density is higher. In the North and Midlands, the effects were mixed, with inelastic labour supply in residential care in the Midlands and inelastic labour supply in domiciliary care in the North. This may be linked with specific ASC market dynamics. Whilst care home supply has been relatively static over time (Allan & Nizalova, 2020), the Midlands had more than 20 per cent growth in domiciliary care providers between 2014-2018 (Allan, 2021), which may have intensified job transitions between residential and domiciliary care and a lower response of employment from outside the sector. The North East and North West had, however, a reduction in the number of domiciliary care providers over the same time period (Allan, 2021), which may have affected care staff across the local pay distribution. The elastic labour supply to the sector in



residential care could potentially be due to larger shares of recruitment from and separations to unemployment or inactivity, which are relatively higher in the North.

Wage elasticities of labour supply to the sector decreased substantially during the pandemic, this is likely because care staff had substantially less job opportunities outside the sector. Moreover, many workers from sectors severely affected by the pandemic (e.g., retail trade and hospitality) did look for jobs in ASC. Unfortunately, the larger workforce inflow in ASC during those challenging times (+40,000 in 2020/21) was followed by a large outflow in 2021/22, leading for the first time in several years to a drop in the filled posts (-65,000) (Skills for Care, 2023a). This could be a sign that wage elasticities may return to the higher per-pandemic levels.

Our results do not capture the substantial increase in immigration to fill in vacancies in the sector since care worker have been added to the skilled worker visa shortage occupation list in 2022 (Skills for Care, 2023a). If we assume that immigrants are willing to work for lower wages (i.e., within the limitations set by immigration rules) and are more restricted to switch jobs to other occupations (i.e., only to occupations on the shortage list, and with the new employer needed to sponsor their visa), new immigrants' wage elasticities of labour supply would likely be lower than those of nationals and settled migrants. On the other hand, immigration may have a displacement effect, with UK nationals (and settled migrants) potentially increasingly moving to better paid jobs outside ASC (Haan & Wnuk, 2024), which would increase wage elasticities for this staff group. Future research may address these potential differences.

Our findings show that increasing wages in the ASC sector can increase employment, with a 5 percent increase in real wages in the sector (and keeping everything else constant) likely to increase employment by 9 to 11 per cent. Our calculations also show that aligning ASC pay to NHS Agenda for Change Band 2 rates (i.e., pay rates for healthcare assistants), representing an about 7 per cent per cent overall wage (i.e., costs) increase for currently employed direct care workers, would lead to an employment increase of between 7 to 13 per cent.

### Limitations

These predictions have their limitations. The labour supply effects of the (potential) ASC wage policies considered do not account for wage responses in other sectors. In the case where employers in non-ASC sectors increase their wages in order to stem the outflow of their workers, our predictions would overstate the impact of wage on employment in the sector.

The predicted effects from a hypothetical introduction of a sector specific minimum wage, assumed the policy would only affect staff with pay below the new minimum. This implicitly assumed that labour supply of staff with higher wages remains unchanged. If the policy has spillover effects on wages above the minimum level, such as by shifting the overall pay scale for the job role upwards, our predictions are likely to understate true employment effects. Since it is likely that these within job spillover effects are smaller than the between-sector wage responses discussed above, we believe that after accounting for both factors, our estimates would represent an overstatement of the 'true' effect of an ASC minimum wage policy.

Wage elasticities are likely to be sensitive to quality of data and the issues mentioned about the wage measurement for domiciliary care workers. We, therefore, suggested the more cautious approach of considering the wage elasticity estimates for the residential care setting as applying for the whole ASC sector.

Wage elasticities are also sensitive to the functional form. Using log transformed wages within the probit estimation mechanically implies that the resulting elasticity of separation is monotonic in

wages. We also presented estimates from a more flexible 3-degree polynomial specification. For these estimates, we got the expected decreasing marginal wage effects on the separation likelihood, but the wage elasticities of labour supply were still increasing with wage for some staff groups (see Appendix, Table A4). The predicted employment effects were, nonetheless, in most cases rather similar, mainly due to the narrow distribution of wages in ASC. Future research may need to address the form of the labour supply curve in ASC in more detail.

Our estimated wage elasticities of labour supply to the sector rely on the steady state assumption that the level of employment in the sector was constant (i.e., the overall flow of recruits equalled the number of separations), and that the size of the wage elasticities of recruitment can be approximated with those of the wage elasticities of separation. The latter simplification allowed us to express the wage elasticity of labour supply to the sector in terms of the overall wage elasticity of separation and the wage elasticity of separation to other employment inside the sector, which we could estimate using the ASC-WDS. The assumption about negligible aggregate employment change is broadly in line with real world observations, with employment in the ASC sector in England having increased on average at about 1 per cent per year over the analysed period (2016-2022). The sharper increase in employment (about 3 per cent) during the 2020/21 pandemic lockdowns (when other sectors, like retail and hospitality, were severely affected and workers were more likely to seek employment in social care) as well as the about 4 per cent drop in employment during 2021/22 (when competing sectors started recruiting again) likely represent slight deviations from the steady state. It is, however, difficult to say how that may have affected the estimated elasticities. A reasonable assumption could be that both the larger recruitment numbers of 2020/21 and larger separation rates in 2021/22 were less motivated by ASC wages but rather by factors outside the sector, and the estimated elasticities were not substantially biased. The latter is broadly consistent with findings of an increase in the portion of the population exiting the workforce (i.e., becoming economically inactive) due to long-term health-related reasons (Office for Budget Responsibility, 2023; Office for National Statistics, 2022).

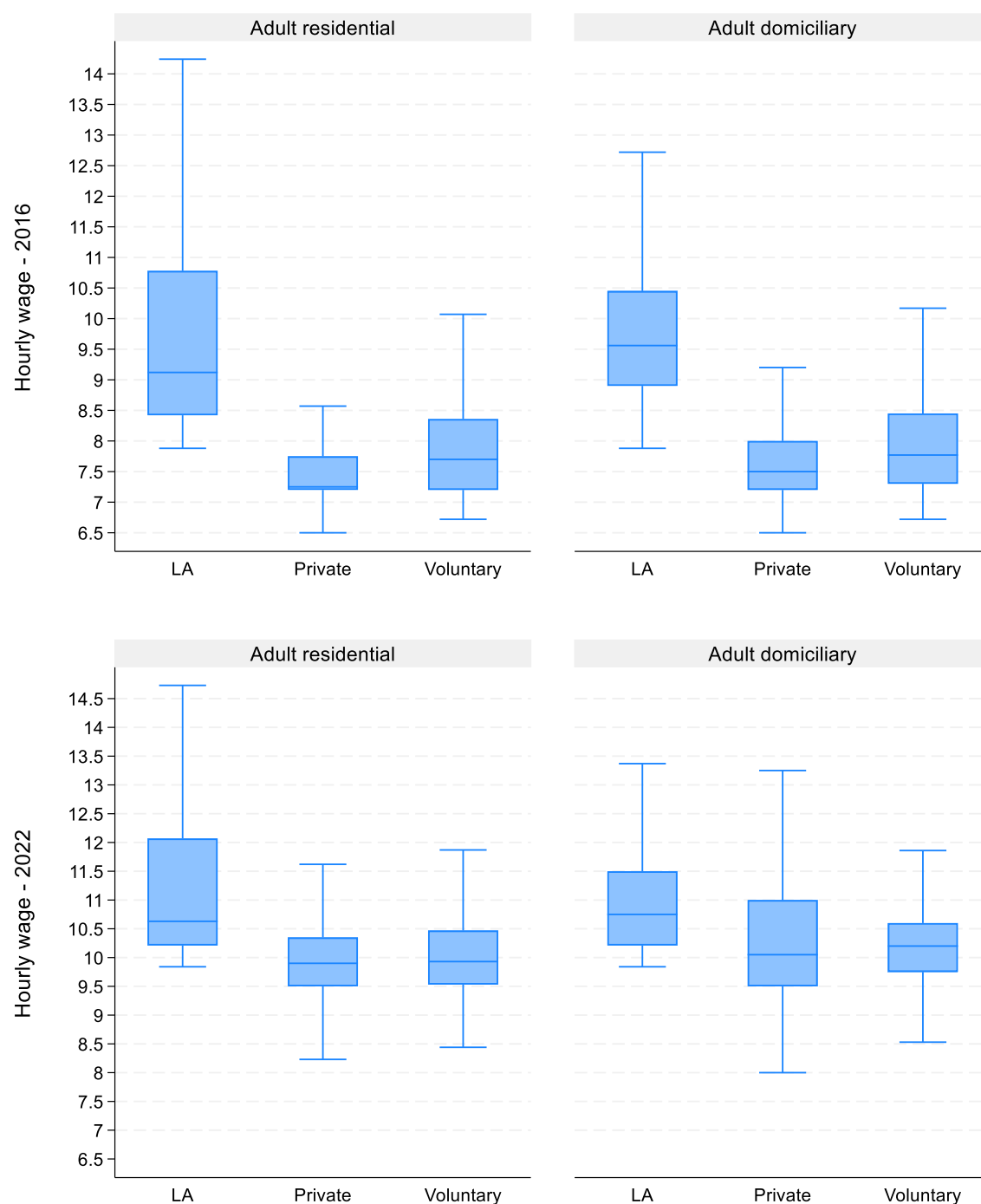
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Figure 1: Hourly wage distribution by sector and care setting – 2016 and 2022



Data source: Adult Social Care Workforce Data Set (ASC-WDS); Oct 2016 and Oct 2022.

Figure 2: Hourly wage distribution in the independent sector by care setting and year

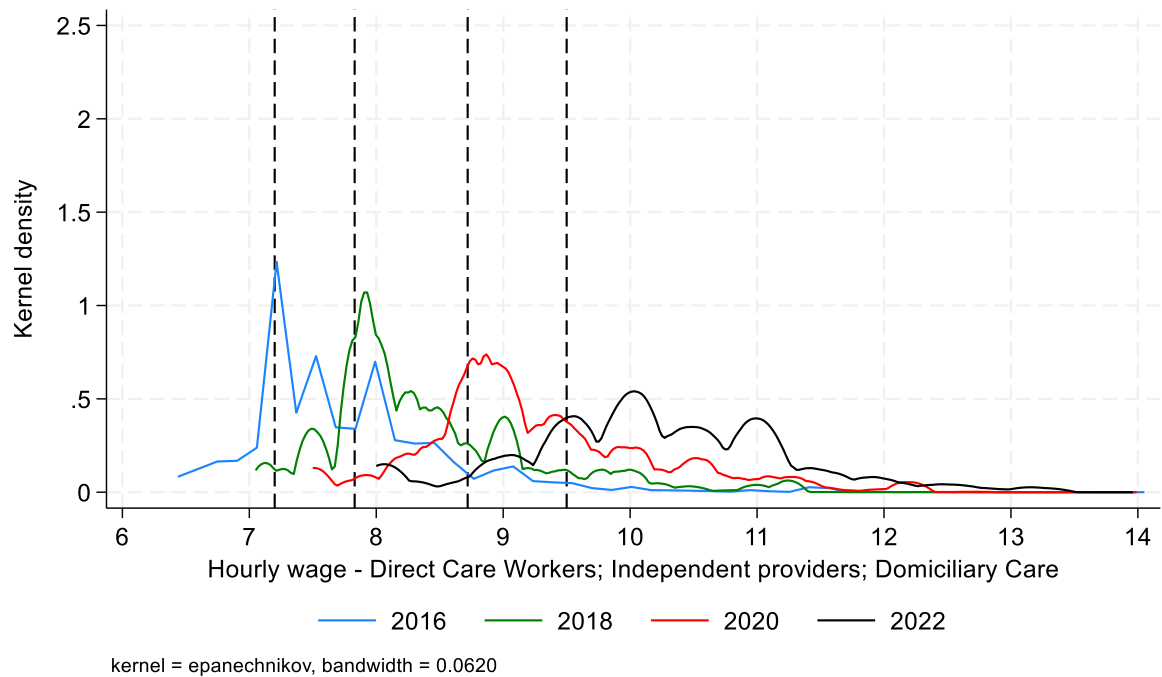
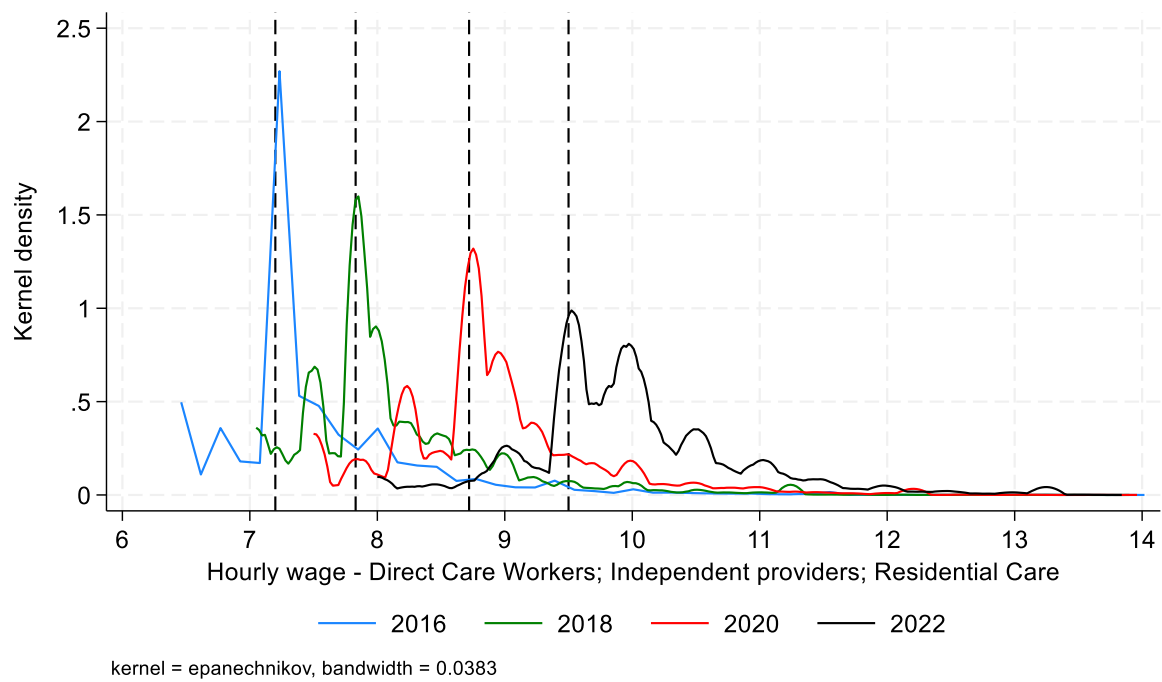


Figure 3: Hourly wage distribution by year – nominal and inflated to 2022 level

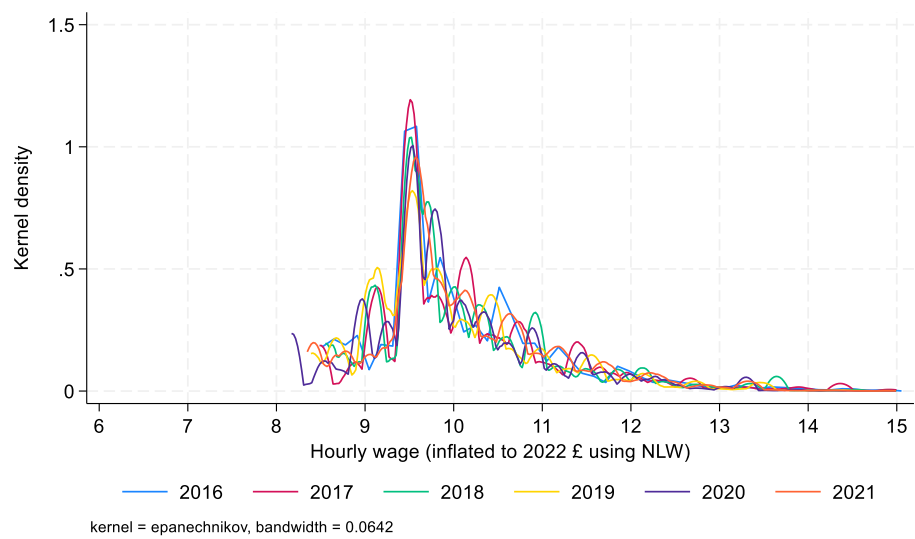
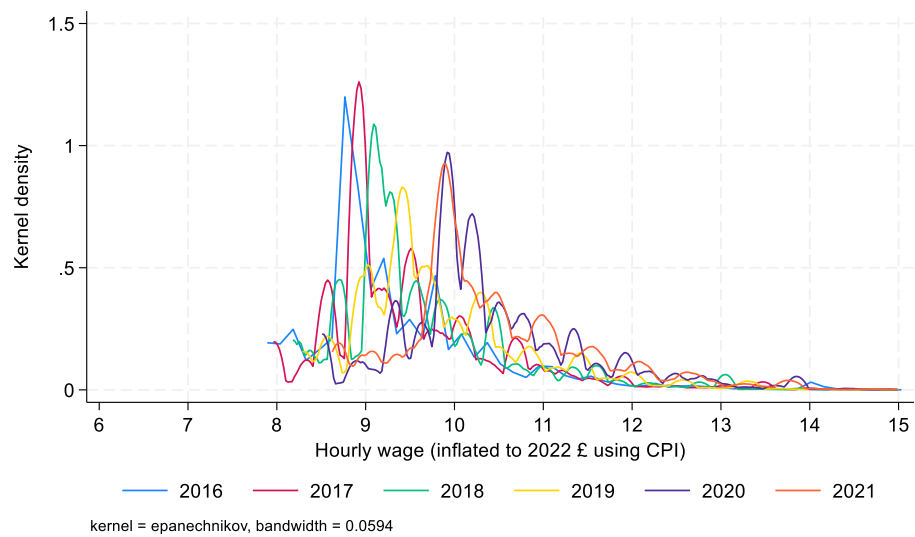
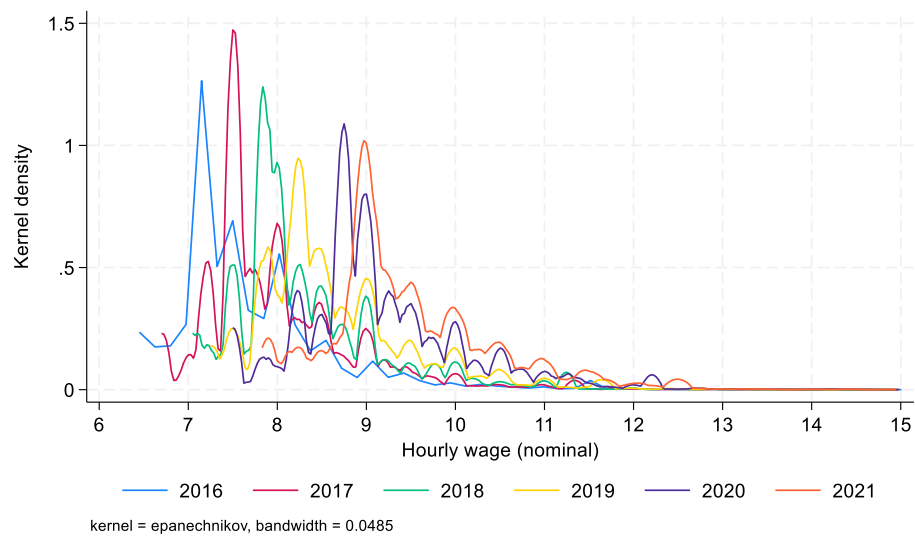
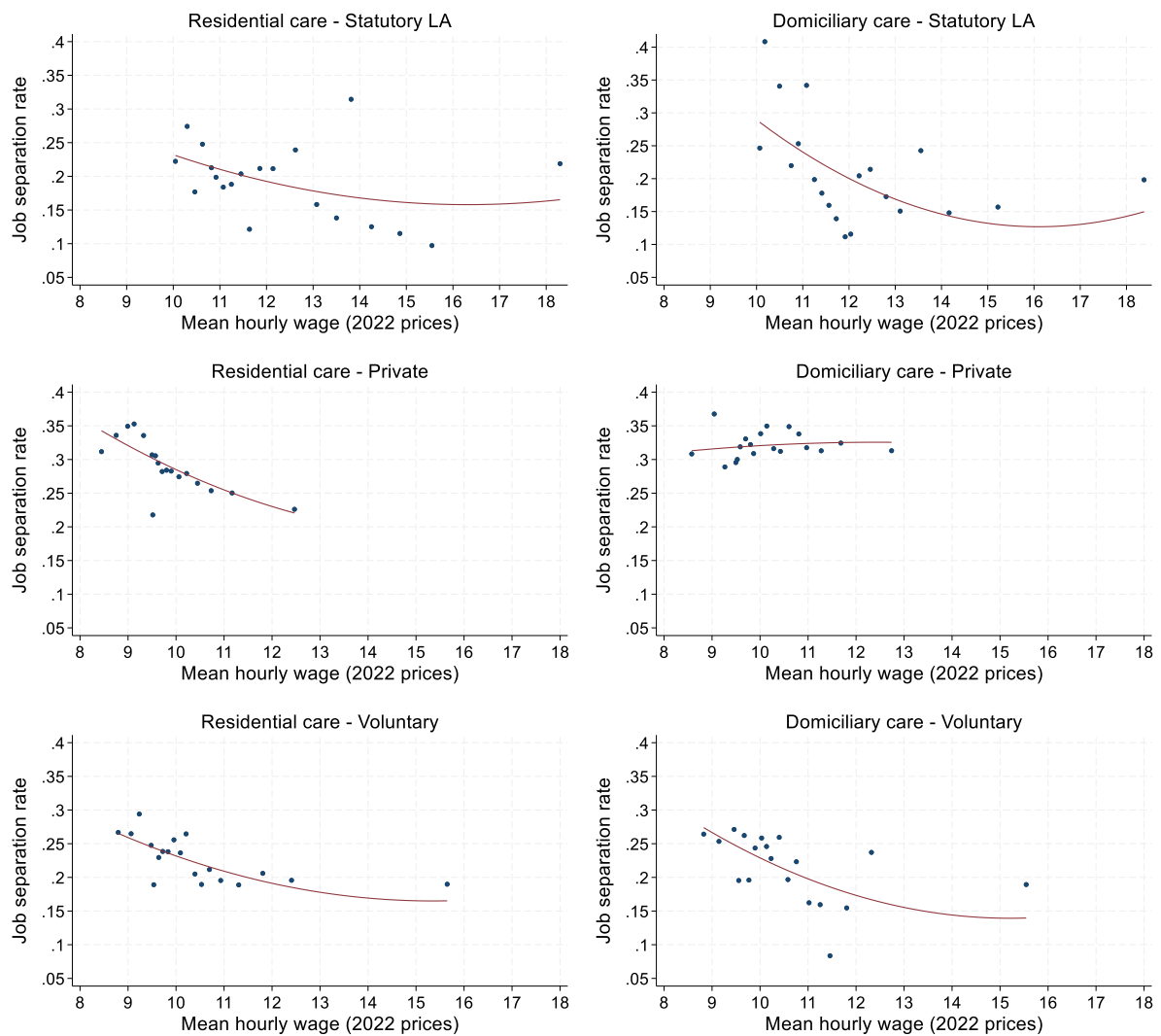




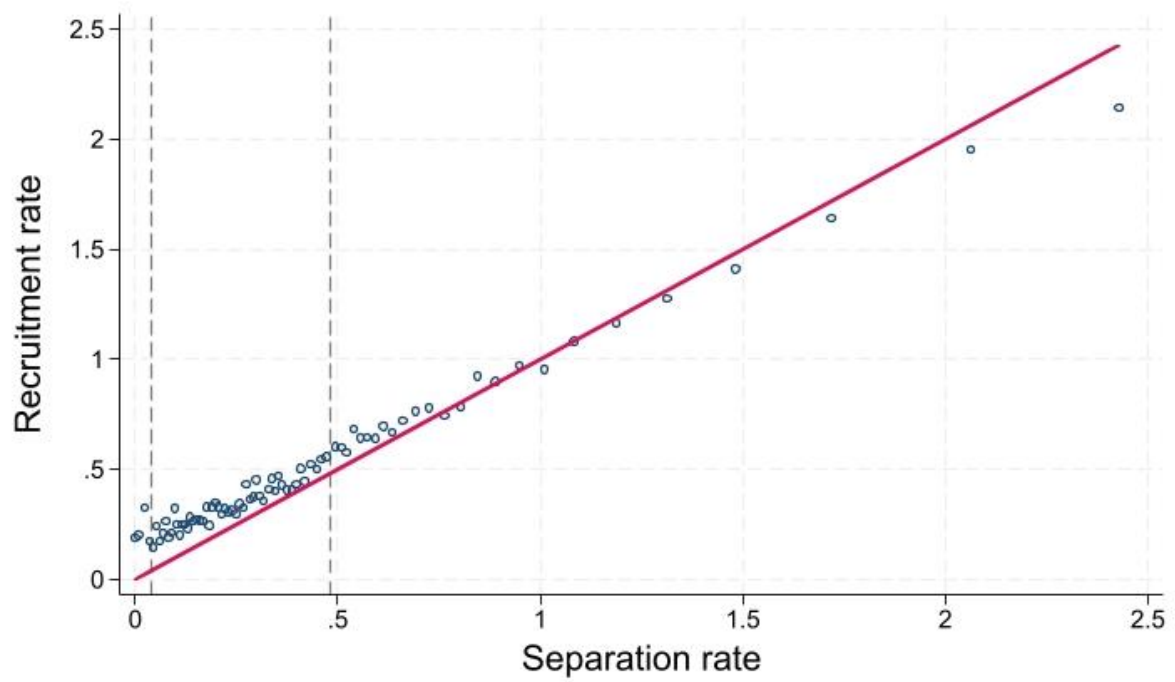
Figure 4: Job separation rate by hourly wage quantiles, care setting and sector



Data source: Adult Social Care Workforce Data Set (ASC-WDS); pooled Oct 2016 to Oct 2021.

Each dot illustrates the mean job separation rate for the respective wage quantile, with the wage distribution divided into 20 quantiles.

Figure 5: Job separation vs. recruitment rates



Note: Data is at establishment-level. Percentile bins are generated by weighing by establishment size. The 45-degree line from the origin indicates equal recruitment and separation rates. The dashed vertical lines indicate the interquartile range (p25 and p75) of the separations rate.

Table 1: Job spells and separations

	Residential care		Domiciliary care	
Observations (spell-years)	308,581		237,185	
Job spells	153,831		121,159	
Workers	146,829		116,057	
Establishments	6,401		2,822	
Job spells ending in separation	47,697	32.5%	41,686	34.4%
Job spells ending in identified transitions to other ASC job	12,513	8.1%	11,419	9.4%
Share of recruits from other ASC employers		62.6%		57.3%

Data source: Adult Social Care Workforce Data Set (ASC-WDS); pooled Oct 2016 to Oct 2021.

Table 2: Sectoral and regional differences in hourly wage, overall job separation rate, and share of recruitment from ASC

	Mean hourly wage ASC (2022 £)			Overall job separation rate			Share of recruitment from ASC			Job density	Unempl. rate	Inactivity rate
	Volunta			Volunta			Volunta					
	LA	Private	ry	LA	Private	ry	LA	Private	ry			
<b>England</b>	<b>12.33</b>	<b>9.99</b>	<b>10.49</b>	<b>0.20</b>	<b>0.31</b>	<b>0.22</b>	<b>0.84</b>	<b>0.59</b>	<b>0.63</b>	<b>0.85</b>	<b>0.042</b>	<b>0.22</b>
<b>North</b>	<b>12.13</b>	<b>9.76</b>	<b>10.21</b>	<b>0.20</b>	<b>0.30</b>	<b>0.22</b>	<b>0.90</b>	<b>0.59</b>	<b>0.60</b>			
North East	12.43	9.64	9.83	0.13	0.28	0.21	0.89	0.64	0.69	0.75	0.059	0.26
North West	12.90	9.74	10.24	0.20	0.31	0.25	0.84	0.59	0.57	0.84	0.045	0.23
Yorkshire and the Humber	11.51	9.88	10.41	0.22	0.31	0.20	0.96	0.57	0.57	0.81	0.044	0.22
<b>Midlands</b>	<b>11.86</b>	<b>9.84</b>	<b>10.18</b>	<b>0.18</b>	<b>0.31</b>	<b>0.22</b>	<b>0.81</b>	<b>0.58</b>	<b>0.60</b>			
East Midlands	11.56	9.84	10.24	0.17	0.32	0.20	0.74	0.55	0.57	0.80	0.038	0.22
West Midlands	12.44	9.84	10.16	0.20	0.30	0.22	0.84	0.61	0.61	0.81	0.049	0.23
<b>South</b>	<b>12.58</b>	<b>10.20</b>	<b>10.78</b>	<b>0.21</b>	<b>0.31</b>	<b>0.22</b>	<b>0.80</b>	<b>0.59</b>	<b>0.67</b>			
Eastern	12.06	10.03	10.45	0.21	0.30	0.21	0.69	0.54	0.56	0.84	0.034	0.19
London	13.60	10.25	11.01	0.15	0.29	0.21	0.83	0.63	0.70	1.02	0.055	0.21
South East	12.45	10.33	10.75	0.22	0.31	0.24	0.80	0.58	0.71	0.85	0.036	0.19
South West	12.33	10.13	10.70	0.27	0.32	0.22	0.92	0.61	0.61	0.87	0.029	0.20

Data source: The Mean hourly wage, Overall job separation rates, and Share of recruitment from ASC are from the Adult Social Care Workforce Data Set (ASC-WDS); pooled Oct 2016 to Oct 2021. Data on job density are from nomis 2021. Data on unemployment inactivity are from nomis, Annual Population Survey 2021/22.

Table 3: Wage elasticities of separation and of labour supply to the sector by care setting – direct care workers

	cloglog	probit	CRE probit	95% CI	
<b>All settings</b>					
Elasticity of job separation (overall)	-0.39***	-0.37***	-2.35***	-2.58	-2.13
Elasticity of job separation (inside ASC)	-0.68***	-0.69***	-2.64***	-3.14	-2.14
Share of recruitment from ASC	0.60	0.60	0.60		
Elasticity of labour supply to the sector	-0.07	-0.21	<b>3.85***</b>	2.92	4.78
<b>Residential care</b>					
Elasticity of job separation (overall)	-0.76***	-0.70***	-2.18***	-2.48	-1.89
Elasticity of job separation (inside ASC)	-0.86***	-0.84***	-2.95***	-3.62	-2.27
Share of recruitment from ASC	0.63	0.63	0.63		
Elasticity of labour supply to the sector	1.20***	0.91***	<b>1.80***</b>	0.48	3.12
<b>Domiciliary care</b>					
Elasticity of job separation (overall)	-0.18***	-0.17***	-2.54***	-2.87	-2.20
Elasticity of job separation (inside ASC)	-0.57***	-0.55***	-2.44***	-3.16	-1.71
Share of recruitment from ASC	0.57	0.57	0.57		
Elasticity of labour supply to the sector	-0.69***	-0.71***	<b>5.35***</b>	3.67	7.04

Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

Table 4: Wage elasticities of separation and of labour supply to the sector by age group and care setting – direct care workers

	Res & Dom Care	Res Care	Dom Care
<b>Age 16 to 29</b>			
Elasticity of job separation (overall)	-2.84***	-3.02***	-2.61***
Elasticity of job separation (inside ASC)	-3.69***	-4.03***	-3.67***
Share of recruitment from ASC	0.54	0.57	0.51
Elasticity of labour supply to the sector	<b>3.65***</b>	<b>3.35***</b>	<b>3.03**</b>
<b>Age 30 to 44</b>			
Elasticity of job separation (overall)	-2.38***	-2.46***	-2.23***
Elasticity of job separation (inside ASC)	-2.53***	-2.99***	-1.99***
Share of recruitment from ASC	0.60	0.63	0.58
Elasticity of labour supply to the sector	<b>4.29***</b>	<b>3.18***</b>	<b>5.10***</b>
<b>Age 45 to 59</b>			
Elasticity of job separation (overall)	-2.26***	-1.89***	-2.54***
Elasticity of job separation (inside ASC)	-2.59***	-2.94***	-2.29***
Share of recruitment from ASC	0.63	0.67	0.60
Elasticity of labour supply to the sector	<b>3.40***</b>	<b>-0.37</b>	<b>5.84***</b>

Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

Table 5: Wage elasticities of separation and of labour supply to the sector by experience in ASC and care setting – direct care workers

	Res & Dom		
	Care	Res Care	Dom Care
<b>Experience: less than 2 years</b>			
Elasticity of job separation (overall)	0.86	0.59	0.70
Elasticity of job separation (inside ASC)	0.75	0.47	-0.17
Share of recruitment from ASC	0.45	0.45	0.45
Elasticity of labour supply to the sector	<b>-1.91</b>	<b>-1.37</b>	<b>-2.78</b>
<b>Experience: 2 to 4 years</b>			
Elasticity of job separation (overall)	-1.52***	-1.55***	-1.88***
Elasticity of job separation (inside ASC)	-1.48***	-1.61**	-2.41***
Share of recruitment from ASC	0.58	0.60	0.56
Elasticity of labour supply to the sector	<b>3.16***</b>	<b>2.93**</b>	<b>2.38*</b>
<b>Experience: 5 to 9 years</b>			
Elasticity of job separation (overall)	-2.31***	-2.49***	-2.30***
Elasticity of job separation (inside ASC)	-2.02***	-3.07***	-1.33*
Share of recruitment from ASC	0.63	0.65	0.60
Elasticity of labour supply to the sector	<b>5.60***</b>	<b>2.83**</b>	<b>7.56***</b>
<b>Experience: 10 years or more</b>			
Elasticity of job separation (overall)	-1.89***	-1.89***	-1.96***
Elasticity of job separation (inside ASC)	-2.64***	-3.04***	-2.48***
Share of recruitment from ASC	0.67	0.68	0.66
Elasticity of labour supply to the sector	<b>0.77</b>	<b>-1.02</b>	<b>1.91</b>

Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4).

Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

Table 6: Wage elasticities of separation and of labour supply to the sector by urban/rural location and care setting – direct care workers

	Res & Dom		
	Care	Res Care	Dom Care
<b>Urban</b>			
Elasticity of job separation (overall)	-2.22***	-1.91***	-2.51***
Elasticity of job separation (inside ASC)	-2.44***	-2.50***	-2.47***
Share of recruitment from ASC	0.60	0.64	0.57
Elasticity of labour supply to the sector	<b>3.74***</b>	<b>1.69**</b>	<b>5.11***</b>
<b>Rural</b>			
Elasticity of job separation (overall)	-3.15***	-3.40***	-3.06***
Elasticity of job separation (inside ASC)	-4.22***	-4.94***	-4.24***
Share of recruitment from ASC	0.57	0.56	0.59
Elasticity of labour supply to the sector	<b>3.45***</b>	<b>2.89**</b>	<b>2.76</b>

Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4).

Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

Table 7: Wage elasticities of separation and of labour supply to the sector by region and care setting – direct care workers

	Res & Dom Care	Res Care	Dom Care
<b>North</b>			
Elasticity of job separation (overall)	-3.06***	-3.62***	-2.27***
Elasticity of job separation (inside ASC)	-4.92***	-4.91***	-4.44***
Share of recruitment from ASC	0.60	0.64	0.56
Elasticity of labour supply to the sector	<b>0.56</b>	<b>2.60**</b>	<b>-1.03</b>
<b>Midlands</b>			
Elasticity of job separation (overall)	-3.61***	-3.34***	-3.47***
Elasticity of job separation (inside ASC)	-4.23***	-5.51***	-4.21***
Share of recruitment from ASC	0.58	0.63	0.54
Elasticity of labour supply to the sector	<b>5.50***</b>	<b>-0.57</b>	<b>5.18***</b>
<b>South</b>			
Elasticity of job separation (overall)	-1.58***	-1.19***	-2.17***
Elasticity of job separation (inside ASC)	-1.23***	-1.22***	-1.78***
Share of recruitment from ASC	0.60	0.62	0.59
Elasticity of labour supply to the sector	<b>4.21***</b>	<b>2.29***</b>	<b>5.46***</b>

Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

Table 8: Wage elasticities of separation and of labour supply to the sector by year and care setting – direct care workers

	2016	2017	2018	2019	2020	2021
<b>All settings</b>						
Elasticity of job separation (overall)	-2.39***	-3.06***	-2.58***	-2.00***	-1.59***	-0.94***
Elasticity of job separation (inside ASC)	-1.98***	-2.88***	-2.54***	-1.73***	-2.41***	-1.23***
Share of recruitment from ASC	0.60	0.61	0.63	0.62	0.56	0.54
Elasticity of labour supply to the sector	<b>5.97***</b>	<b>6.72***</b>	<b>5.33***</b>	<b>4.90***</b>	<b>1.06*</b>	<b>1.18***</b>
<b>Residential care</b>						
Elasticity of job separation (overall)	-1.86***	-2.35***	-2.30***	-1.69***	-1.55***	-0.91***
Elasticity of job separation (inside ASC)	-2.86***	-3.01***	-2.94***	-1.80***	-2.32***	-1.20***
Share of recruitment from ASC	0.61	0.62	0.64	0.66	0.60	0.61
Elasticity of labour supply to the sector	<b>0.52</b>	<b>2.54***</b>	<b>2.27***</b>	<b>2.95***</b>	<b>0.80</b>	<b>0.90</b>
<b>Domiciliary care</b>						
Elasticity of job separation (overall)	-2.68***	-3.73***	-2.76***	-2.32***	-1.61***	-0.84***
Elasticity of job separation (inside ASC)	-1.62***	-3.02***	-2.35***	-2.18***	-2.41***	-1.09***
Share of recruitment from ASC	0.58	0.61	0.63	0.59	0.53	0.49
Elasticity of labour supply to the sector	<b>8.33***</b>	<b>9.63***</b>	<b>6.90***</b>	<b>5.07***</b>	<b>1.42*</b>	<b>1.20*</b>

Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Notes: As CRN probit panel data estimations cannot be run stratified by year, we estimated wage elasticities of job separation by year from interactions between wage and year. We expected though that effects of other covariates vary by year as well and also included interactions between year and training incidence, employment on zero-hours contract, sector, employer level staff turnover during the previous 12 months, employer CQC rating with respect to 'Well-led', the 1<sup>st</sup> quartile of the local are wage distribution, and region. Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

Table 9: Employment effects of percentual wage increase

	log of wages			3-degree polynomial of wages		
Wage (2022 £)	10.11	10.31	10.62	10.11	10.31	10.62
Wage elasticity job separation (overall)	-2.37***	-2.41***	-2.48***	-2.94***	-2.80***	-2.55***
Wage elasticity job separation (to jobs inside ASC)	-2.64***	-2.67***	-2.71***	-3.45***	-3.22***	-2.86***
Share of recruitment from inside ASC	0.60	0.60	0.60	0.60	0.60	0.60
Wage elasticity labour supply to the sector	3.90***	4.05***	4.26***	4.36***	4.33***	4.21***
<b>Increase in real wage (%)</b>		<b>2.0%</b>	<b>5.0%</b>		<b>2.0%</b>	<b>5.0%</b>
<b>Predicted increase in employment (%)</b>		<b>7.9%</b>	<b>20.4%</b>		<b>8.7%</b>	<b>21.4%</b>
<b><i>Based on wage elasticities of separation in residential care</i></b>						
Real wage (2022 £)	10.11	10.31	10.62	10.11	10.31	10.62
Wage elasticity job separation (overall)	-2.22***	-2.26***	-2.31***	-2.82***	-2.69***	-2.48***
Wage elasticity job separation (to jobs inside ASC)	-2.98***	-3.01***	-3.06***	-4.18***	-3.90***	-3.44***
Share of recruitment from inside ASC	0.60	0.60	0.60	0.60	0.60	0.60
Wage elasticity labour supply to the sector	2.19***	2.28***	2.40***	1.59***	1.80***	2.10***
<b>Increase in real wage (%)</b>		<b>2.0%</b>	<b>5.0%</b>		<b>2.0%</b>	<b>5.0%</b>
<b>Predicted increase in employment (%)</b>		<b>4.5%</b>	<b>11.5%</b>		<b>3.4%</b>	<b>9.2%</b>

Significance level: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Note: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.



Table 10: Employment effects of introducing minimum wage to ASC sector

	log of wages			3-degree polynomial of wages		
	9.50	10.00	10.50	9.50	10.00	10.50
Wage (2022 £)						
Wage elasticity job separation (overall)	-2.23***	-2.34***	-2.45***	-3.26***	-3.01***	-2.65***
Wage elasticity job separation (to jobs inside ASC)	-2.56***	-2.63***	-2.70***	-4.04***	-3.57***	-3.00***
Share of recruitment from inside ASC	0.59	0.59	0.60	0.59	0.59	0.60
Wage elasticity labour supply to the sector	3.49***	3.85***	4.16***	4.25***	4.41***	4.25***
Share of workers below wage increment (2022)	0.176	0.274	0.222	0.176	0.274	0.222
Cumulated share of workers below wage increment (2022)	0.176	0.451	0.673	0.176	0.451	0.673
(Real) wage floor increase (£)		0.50	1.00		0.50	1.00
<b>(Real) overall payroll increase (%)</b>		<b>1.6%</b>	<b>4.5%</b>		<b>1.6%</b>	<b>4.5%</b>
<b>Predicted increase in employment (%)</b>		<b>6.1%</b>	<b>17.3%</b>		<b>7.1%</b>	<b>19.3%</b>
<b><i>Based on wage elasticities of separation in residential care</i></b>						
Wage (2022 £)	9.50	10.00	10.50	9.50	10.00	10.50
Wage elasticity job separation (overall)	-2.11***	-2.20***	-2.29***	-3.10***	-2.88***	-2.56***
Wage elasticity job separation (to jobs inside ASC)	-2.87***	-2.96***	-3.04***	-4.89***	-4.32***	-3.62***
Share of recruitment from inside ASC	0.59	0.59	0.60	0.59	0.59	0.60
Wage elasticity labour supply to the sector	2.00***	2.21***	2.32***	1.04*	1.60***	1.93***
Share of workers below wage increment (2022)	0.176	0.274	0.222	0.176	0.274	0.222
Cumulated share of workers below wage increment (2022)	0.176	0.451	0.673	0.176	0.451	0.673
(Real) wage floor increase (£)		0.50	1.00		0.50	1.00
<b>(Real) overall payroll increase (%)</b>		<b>1.6%</b>	<b>4.5%</b>		<b>1.6%</b>	<b>4.5%</b>
<b>Predicted increase in employment (%)</b>		<b>3.5%</b>	<b>9.8%</b>		<b>2.2%</b>	<b>7.1%</b>

Significance level: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Note: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

Table 11: Employment effects of Increasing wages in ASC to NHS agenda for change wages

	log of wages				3-degree polynomial of wages			
	Experience: <2 years		Experience: 2+ years		Experience: <2 years		Experience: 2+ years	
Wage (2022 £)	9.50	10.37	9.50	10.90	9.50	10.37	9.50	10.90
Wage elasticity job separation (overall)			-1.99***	-2.22***			-2.97***	-2.03***
Wage elasticity job separation (to jobs inside ASC)			-2.11***	-2.24***			-3.74***	-1.99***
Share of recruitment from inside ASC			0.61	0.65			0.61	0.65
Wage elasticity labour supply to the sector	0.00 <sup>a</sup>	0.00 <sup>a</sup>	3.62***	4.39***	0.00 <sup>a</sup>	0.00 <sup>a</sup>	3.55***	4.21***
Cumulated share of workers below wage increment (2022)	0.020	0.097	0.170	0.675	0.020	0.097	0.170	0.675
Real wage floor increase (£)		0.87		1.40		0.87		1.40
<b>Real overall payroll increase (%)</b>		<b>0.5%</b>		<b>6.5%</b>		<b>0.5%</b>		<b>6.5%</b>
<b>Predicted increase in employment (%)</b>		<b>0.0%</b>		<b>25.4%</b>		<b>0.0%</b>		<b>24.9%</b>
<i>Based on wage elasticities of separation in residential care</i>								
	Experience: <2 years		Experience: 2+ years		Experience: <2 years		Experience: 2+ years	
Wage (2022 £)	9.50	10.37	9.50	10.90	9.50	10.37	9.50	10.90
Wage elasticity job separation (overall)			-1.86***	-2.05***			-2.79***	-2.04***
Wage elasticity job separation (to jobs inside ASC)			-2.43***	-2.59***			-4.94***	-2.38***
Share of recruitment from inside ASC			0.61	0.65			0.61	0.65
Wage elasticity labour supply to the sector	0.00 <sup>a</sup>	0.00 <sup>a</sup>	1.98***	2.09***	0.00 <sup>a</sup>	0.00 <sup>a</sup>	0.00 <sup>a</sup>	2.78***
Cumulated share of workers below wage increment (2022)	0.020	0.097	0.170	0.675	0.020	0.097	0.170	0.675
Real wage floor increase (£)		0.87		1.40		0.87		1.40
<b>Real overall payroll increase (%)</b>		<b>0.5%</b>		<b>6.5%</b>		<b>0.5%</b>		<b>6.5%</b>
<b>Predicted increase in employment (%)</b>		<b>0.0%</b>		<b>13.1%</b>		<b>0.0%</b>		<b>7.4%</b>

Significance level: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications. <sup>a</sup> Statistically insignificant and/or negative value replaced with zero for simplicity.

## Appendix

Table A1: Sample representativeness – establishment level; residential care

	CQC directory						ASC-WDS sample					
	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
Sector: Statutory LA	0.03	0.03	0.03	0.03	0.03	0.03	0.06	0.06	0.06	0.07	0.09	0.07
Sector: Private	0.81	0.82	0.82	0.83	0.84	0.84	0.75	0.76	0.79	0.77	0.76	0.77
Sector: Voluntary	0.16	0.15	0.15	0.14	0.14	0.13	0.19	0.18	0.15	0.16	0.15	0.16
Service type: Care home w/ nursing	0.27	0.27	0.28	0.28	0.28	0.28	0.29	0.30	0.35	0.31	0.30	0.32
Service type: Care home w/o nursing	0.73	0.73	0.72	0.72	0.72	0.72	0.71	0.70	0.65	0.69	0.70	0.68
Capacity (i.e., care home beds)	27.84	28.30	28.72	29.10	29.51	29.91	33.17	34.21	35.92	33.00	31.24	33.35
CQC rating: No rating received	0.20	0.08	0.06	0.04	0.03	0.03	0.15	0.04	0.04	0.02	0.05	0.02
CQC rating: Inadequate/Req. improvement	0.23	0.20	0.18	0.17	0.17	0.17	0.20	0.17	0.16	0.18	0.13	0.12
CQC rating: Good/Outstanding	0.57	0.73	0.76	0.80	0.80	0.80	0.65	0.79	0.80	0.80	0.82	0.86
Region: East	0.11	0.11	0.11	0.11	0.11	0.11	0.13	0.13	0.13	0.13	0.12	0.12
Region: East Midlands	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.10	0.09	0.10	0.10
Region: London	0.09	0.09	0.09	0.09	0.09	0.09	0.06	0.06	0.05	0.05	0.05	0.06
Region: North East	0.05	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.05	0.06
Region: North West	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.10
Region: South East	0.19	0.19	0.19	0.19	0.19	0.19	0.16	0.17	0.16	0.16	0.18	0.20
Region: South West	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.15	0.15
Region: West Midlands	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.12
Region: Yorkshire and the Humber	0.10	0.10	0.09	0.10	0.10	0.10	0.12	0.13	0.13	0.13	0.12	0.10
Observations	16,385	16,073	15,780	15,482	15,327	15,049	4,352	4,161	3,913	2,883	2,098	2,269

Source: Care Quality Commission care directory; Adult Social Care Workforce Data Set (ASC-WDS).

Table A2: Sample representativeness – establishment level; domiciliary care

	CQC directory						ASC-WDS sample					
	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
Sector: Statutory LA	0.04	0.03	0.03	0.03	0.03	0.03	0.08	0.08	0.09	0.10	0.12	0.11
Sector: Private	0.83	0.85	0.86	0.87	0.88	0.89	0.79	0.80	0.81	0.80	0.78	0.80
Sector: Voluntary	0.13	0.12	0.11	0.10	0.09	0.08	0.12	0.12	0.11	0.10	0.10	0.09
CQC rating: No rating received	0.53	0.30	0.25	0.20	0.21	0.21	0.37	0.13	0.10	0.06	0.06	0.04
CQC rating: Inadequate/Req. improvement	0.10	0.12	0.11	0.11	0.10	0.09	0.12	0.13	0.09	0.11	0.08	0.07
CQC rating: Good/Outstanding	0.37	0.58	0.64	0.69	0.69	0.70	0.52	0.74	0.81	0.83	0.86	0.89
Region: East	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.10	0.10
Region: East Midlands	0.09	0.09	0.10	0.10	0.10	0.10	0.07	0.08	0.08	0.07	0.06	0.07
Region: London	0.14	0.15	0.16	0.16	0.16	0.15	0.10	0.10	0.10	0.10	0.08	0.09
Region: North East	0.04	0.03	0.03	0.03	0.03	0.03	0.05	0.06	0.05	0.05	0.05	0.07
Region: North West	0.12	0.12	0.11	0.11	0.11	0.12	0.15	0.16	0.14	0.14	0.12	0.12
Region: South East	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.15	0.16	0.17	0.19	0.18
Region: South West	0.11	0.10	0.10	0.09	0.10	0.10	0.12	0.11	0.11	0.12	0.14	0.14
Region: West Midlands	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.11
Region: Yorkshire and the Humber	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.11	0.12	0.11	0.12	0.12
Observations	8,100	8,369	8,800	9,208	9,658	9,678	1,574	1,621	1,621	1,342	1,051	993

Source: Care Quality Commission care directory; Adult Social Care Workforce Data Set (ASC-WDS).

Table A3: Job separation estimations – marginal effects, all care settings

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	cloglog	Job separation overall probit	CRE probit	cloglog	Job separation to ASC jobs probit	CRE probit
Job tenure: >1 & <=2 years	-0.052*** (0.003)	-0.055*** (0.003)	-0.100*** (0.002)	-0.014*** (0.002)	-0.015*** (0.002)	-0.055*** (0.003)
Job tenure: >2 & <=4 years	-0.104*** (0.003)	-0.108*** (0.003)	-0.236*** (0.002)	-0.028*** (0.002)	-0.030*** (0.002)	-0.118*** (0.003)
Job tenure: >4 & <=8 years	-0.151*** (0.003)	-0.154*** (0.003)	-0.365*** (0.002)	-0.044*** (0.002)	-0.046*** (0.002)	-0.168*** (0.003)
Job tenure: >8 years	-0.210*** (0.003)	-0.208*** (0.003)	-0.419*** (0.002)	-0.058*** (0.002)	-0.060*** (0.002)	-0.183*** (0.003)
Age	-0.004*** (0.000)	-0.006*** (0.001)	-0.002*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	0.001*** (0.000)
Age squared (x 1,000)	0.017*** (0.006)	0.034*** (0.006)	-0.016*** (0.006)	0.006 (0.005)	0.006 (0.005)	-0.026*** (0.004)
Female	-0.013*** (0.002)	-0.013*** (0.002)	-0.010*** (0.002)	0.001 (0.002)	0.000 (0.002)	0.001 (0.002)
Nationality: British	-0.012*** (0.002)	-0.013*** (0.002)	-0.011 (0.017)	-0.003* (0.002)	-0.003** (0.002)	-0.012 (0.009)
Qualification: yes	-0.017*** (0.002)	-0.018*** (0.002)	-0.002 (0.006)	-0.007*** (0.001)	-0.007*** (0.001)	-0.003 (0.004)
Training (any): yes	-0.030*** (0.002)	-0.032*** (0.002)	0.029*** (0.007)	-0.020*** (0.001)	-0.019*** (0.001)	0.004 (0.006)
Job role: care worker	0.003 (0.003)	0.003 (0.003)	-0.006 (0.007)	-0.010*** (0.002)	-0.009*** (0.002)	-0.006 (0.004)
Job role: other care-providing	0.000 (0.005)	0.002 (0.005)	0.022 (0.015)	-0.001 (0.004)	-0.001 (0.004)	0.038*** (0.012)
Hourly wage (log; 2022 £)	-0.113*** (0.010)	-0.101*** (0.009)	-0.491*** (0.024)	-0.060*** (0.007)	-0.057*** (0.007)	-0.167*** (0.016)
Zero-hours contract	0.030*** (0.002)	0.030*** (0.002)	0.057*** (0.010)	0.003** (0.002)	0.003* (0.002)	0.010* (0.006)
Sector: Private	0.033*** (0.004)	0.029*** (0.004)	0.044*** (0.004)	-0.052*** (0.004)	-0.049*** (0.003)	-0.038*** (0.003)

Sector: Voluntary	-0.008** (0.004)	-0.010*** (0.004)	0.003 (0.004)	-0.066*** (0.004)	-0.061*** (0.003)	-0.049*** (0.003)
Care setting: care home without nursing	-0.011*** (0.002)	-0.009*** (0.002)	-0.011*** (0.002)	0.005*** (0.001)	0.005*** (0.001)	0.002 (0.001)
Care setting: domiciliary care	0.006** (0.003)	0.007*** (0.002)	-0.003 (0.002)	0.005*** (0.002)	0.004** (0.002)	-0.004** (0.002)
User type: young adults	-0.001 (0.002)	0.001 (0.002)	-0.057*** (0.020)	0.035*** (0.002)	0.035*** (0.002)	-0.007 (0.013)
User type: mixed	-0.021*** (0.002)	-0.022*** (0.002)	-0.066*** (0.010)	0.003** (0.001)	0.003** (0.001)	-0.041*** (0.006)
Staff size: medium/large (50+ workers)	-0.013*** (0.002)	-0.014*** (0.002)	0.020*** (0.005)	-0.009*** (0.001)	-0.010*** (0.001)	0.003 (0.003)
Turnover rate (previous 12 months)	0.016*** (0.002)	0.017*** (0.002)	0.017*** (0.003)	0.011*** (0.001)	0.010*** (0.001)	0.006*** (0.002)
Vacancy rate	0.032*** (0.008)	0.032*** (0.009)	0.001 (0.019)	-0.021*** (0.006)	-0.021*** (0.006)	-0.040*** (0.013)
Care worker per SU ratio	-0.001*** (0.000)	-0.001*** (0.000)	-0.000 (0.001)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001 (0.001)
CQC rating (Well-led): Good/Outstanding	-0.032*** (0.002)	-0.032*** (0.002)	0.015*** (0.004)	-0.019*** (0.001)	-0.019*** (0.001)	0.006** (0.003)
CQC rating (Well-led): Not rated	-0.001 (0.004)	0.001 (0.004)	-0.077*** (0.005)	0.032*** (0.003)	0.033*** (0.003)	-0.012*** (0.003)
Unemployment rate (LAD level)	-0.007*** (0.001)	-0.006*** (0.001)	-0.002 (0.002)	-0.003*** (0.001)	-0.003*** (0.001)	0.003* (0.001)
Mean wage 1 <sup>st</sup> quartile (LAD level; log; 2022 £)	0.069*** (0.012)	0.067*** (0.012)	0.116*** (0.030)	0.050*** (0.009)	0.048*** (0.008)	0.048** (0.021)
House price (LAD level; log; 2022 £)	-0.019*** (0.005)	-0.019*** (0.004)	0.017 (0.036)	-0.014*** (0.003)	-0.016*** (0.003)	-0.045* (0.025)
Urban	-0.010*** (0.003)	-0.010*** (0.003)	-0.011*** (0.003)	0.009*** (0.002)	0.009*** (0.002)	0.006*** (0.002)
ASC Unit Costs Residential Care (LA level; log; £/week)	0.017** (0.007)	0.018*** (0.007)	-0.095*** (0.014)	0.007 (0.005)	0.007 (0.005)	-0.056*** (0.009)
ASC Unit Costs Domiciliary Care (LA level; log; £/hour)	-0.044*** (0.009)	-0.047*** (0.009)	-0.074*** (0.017)	0.004 (0.006)	0.004 (0.006)	-0.004 (0.009)
Care home competition (distance-weighted HHI)	0.342***	0.343***	0.050	0.338***	0.363***	0.481

	(0.047)	(0.047)	(0.801)	(0.028)	(0.032)	(0.487)
Home care competition (count of agencies at LAD level; log)	0.006***	0.006***	0.005	0.004***	0.004***	0.002
	(0.001)	(0.001)	(0.010)	(0.001)	(0.001)	(0.006)
Year fixed effects	yes	yes	yes	yes	yes	yes
Region fixed effects	yes	yes	yes	yes	yes	yes
Observations	545,766	545,766	545,766	430,330	430,330	430,330
Zero outcomes	391,568			391,568		
Nonzero outcomes	154,198			38,762		
Log likelihood/pseudo-likelihood	-1,621,097	-1,620,982	-1,385,379	-624,530	-624,121	-528,700
F-test of $\bar{x}_{ij} = 0$ ; Hausman test			48,565***			19,415***

Robust standard errors in parentheses

Significance level: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Base categories: Nationality: Other; Qualification: no qualification; Training: no training received; Job role: senior care worker; Sector: statutory LA; Care setting: care home with nursing; User type: old age; Staff size: micro/small (1-49 workers); CQC rating (Well-led): Inadequate/Requires improvement. CRE probit: conditional random effects probit estimation. LAD: local authority district.

Table A4: Wage elasticities of separation and of labour supply to the sector by wage level, age group and care setting

	log of wage						3-degree polynomial of wages					
	9.00	9.50	10.00	10.50	11.00	11.50	9.00	9.50	10.00	10.50	11.00	11.50
<b>All settings; Age 16-59</b>												
Elasticity of job separation (overall)	-2.11***	-2.23***	-2.34***	-2.45***	-2.56***	-2.66***	-3.38***	-3.26***	-3.01***	-2.65***	-2.20***	-1.69***
Elasticity of job separation (inside ASC)	-2.49***	-2.56***	-2.63***	-2.70***	-2.76***	-2.82***	-4.40***	-4.04***	-3.57***	-3.00***	-2.36***	-1.67***
Share of recruitment from ASC	0.59	0.59	0.59	0.60	0.62	0.63	0.59	0.59	0.59	0.60	0.62	0.63
Elasticity of labour supply to the sector	<b>3.14***</b>	<b>3.49***</b>	<b>3.85***</b>	<b>4.16***</b>	<b>4.4***7</b>	<b>4.79***</b>	<b>3.84***</b>	<b>4.25***</b>	<b>4.41***</b>	<b>4.25***</b>	<b>3.91***</b>	<b>3.45***</b>
<i>Based on elasticities of separation in residential care</i>												
Elasticity of job separation (overall)	-2.01***	-2.11***	-2.20***	-2.29***	-2.38***	-2.47***	-3.22***	-3.10***	-2.88***	-2.56***	-2.17***	-1.72***
Elasticity of job separation (inside ASC)	-2.78***	-2.87***	-2.96***	-3.04***	-3.12***	-3.20***	-5.29***	-4.89***	-4.32***	-3.62***	-2.81***	-1.94***
Share of recruitment from ASC	0.59	0.59	0.59	0.60	0.62	0.63***	0.59	0.59	0.59	0.60	0.62	0.63
Elasticity of labour supply to the sector	<b>1.80***</b>	<b>2.00***</b>	<b>2.21***</b>	<b>2.32***</b>	<b>2.39***</b>	<b>2.48***</b>	<b>0.52</b>	<b>1.04</b>	<b>1.60**</b>	<b>1.93***</b>	<b>2.28***</b>	<b>2.70***</b>
<b>All settings; Age 16-29</b>												
Elasticity of job separation (overall)	-2.48***	-2.69***	-2.90***	-3.10***	-3.30***	-3.50***	-3.48***	-3.51***	-3.39***	-3.12***	-2.74***	-2.25***
Elasticity of job separation (inside ASC)	-3.44***	-3.59***	-3.73***	-3.87***	-4.00***	-4.13***	-5.85***	-5.33***	-4.58***	-3.66***	-2.61***	-1.48***
Share of recruitment from ASC	0.53	0.55	0.55	0.55	0.55	0.57	0.53	0.55	0.55	0.55	0.55	0.57
Elasticity of labour supply to the sector	<b>2.77***</b>	<b>3.20***</b>	<b>3.77***</b>	<b>4.32***</b>	<b>4.88***</b>	<b>5.34***</b>	<b>1.54</b>	<b>2.58**</b>	<b>3.87***</b>	<b>4.94***</b>	<b>5.80***</b>	<b>6.51***</b>
<i>Based on elasticities of separation in residential care</i>												
Elasticity of job separation (overall)	-2.73***	-2.95***	-3.17***	-3.39***	-3.60***	-3.80***	-3.96***	-3.87***	-3.59***	-3.14***	-2.55***	-1.87***
Elasticity of job separation (inside ASC)	-3.7***9	-3.96***	-4.13***	-4.29***	-4.45***	-4.59***	-7.12***	-6.30***	-5.14***	-3.74***	-2.18***	-0.58***
Share of recruitment from ASC	0.53	0.55	0.55	0.55	0.55	0.57	0.53	0.55	0.55	0.55	0.55	0.57
Elasticity of labour supply to the sector	<b>3.03***</b>	<b>3.44***</b>	<b>4.01***</b>	<b>4.55***</b>	<b>5.11***</b>	<b>5.53***</b>	<b>0.70</b>	<b>1.82</b>	<b>3.39***</b>	<b>4.80***</b>	<b>6.02***</b>	<b>7.16***</b>

Significance level: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.



Table A4: Wage elasticities of separation and of labour supply to the sector by wage level, age group and care setting (continued)

	log of wage						3-degree polynomial of wages					
	9.00	9.50	10.00	10.50	11.00	11.50	9.00	9.50	10.00	10.50	11.00	11.50
<b>All settings; Age 30-44</b>												
Elasticity of job separation (overall)	-2.12***	-2.24***	-2.36***	-2.48***	-2.59***	-2.70***	-3.36***	-3.28***	-3.08***	-2.78***	-2.39***	-1.93***
Elasticity of job separation (inside ASC)	-2.39***	-2.46***	-2.52***	-2.58***	-2.64***	-2.70***	-4.74***	-4.31***	-3.75***	-3.07***	-2.31***	-1.50***
Share of recruitment from ASC	0.60	0.60	0.60	0.61	0.62	0.63	0.60	0.60	0.60	0.61	0.62	0.63
Elasticity of labour supply to the sector	<b>3.43***</b>	<b>3.84***</b>	<b>4.25***</b>	<b>4.63***</b>	<b>5.01***</b>	<b>5.40***</b>	<b>2.50**</b>	<b>3.43***</b>	<b>4.16***</b>	<b>4.68***</b>	<b>5.06***</b>	<b>5.35***</b>
<i>Based on elasticities of separation in residential care</i>												
Elasticity of job separation (overall)	-2.22***	-2.35***	-2.48***	-2.60***	-2.71***	-2.82***	-3.65***	-3.62***	-3.45***	-3.16***	-2.77***	-2.29***
Elasticity of job separation (inside ASC)	-2.81***	-2.90***	-2.99***	-3.07***	-3.16***	-3.23***	-6.03***	-5.59***	-4.94***	-4.11***	-3.14***	-2.10***
Share of recruitment from ASC	0.60	0.60	0.60	0.61	0.62	0.63	0.60	0.60	0.60	0.61	0.62	0.63
Elasticity of labour supply to the sector	<b>2.67***</b>	<b>3.04***</b>	<b>3.39***</b>	<b>3.71***</b>	<b>3.98***</b>	<b>4.25***</b>	<b>0.09</b>	<b>1.23</b>	<b>2.37**</b>	<b>3.38***</b>	<b>4.31***</b>	<b>5.26***</b>
<b>All settings; Age 45-59</b>												
Elasticity of job separation (overall)	-2.05***	-2.14***	-2.23***	-2.32***	-2.40***	-2.49***	-3.26***	-3.12***	-2.89***	-2.57***	-2.17***	-1.72***
Elasticity of job separation (inside ASC)	-2.43***	-2.50	-2.57***	-2.63***	-2.69***	-2.74***	-3.34***	-3.26***	-3.12***	-2.94***	-2.71***	-2.45***
Share of recruitment from ASC	0.62	0.62	0.62	0.63	0.64	0.65	0.62	0.62	0.62	0.63	0.64	0.65
Elasticity of labour supply to the sector	<b>2.80***</b>	<b>3.08***</b>	<b>3.36***</b>	<b>3.60***</b>	<b>3.82***</b>	<b>4.02***</b>	<b>6.23***</b>	<b>5.81***</b>	<b>5.02***</b>	<b>3.90***</b>	<b>2.47***</b>	<b>0.75</b>
<i>Based on elasticities of separation in residential care</i>												
Elasticity of job separation (overall)	-1.76***	-1.83***	-1.89***	-1.95***	-2.01***	-2.06***	-2.72***	-2.64***	-2.50***	-2.30***	-2.04***	-1.74***
Elasticity of job separation (inside ASC)	-2.76***	-2.85***	-2.93***	-3.01***	-3.09***	-3.16***	-4.16***	-4.07***	-3.91***	-3.67***	-3.36***	-2.99***
Share of recruitment from ASC	0.62	0.62	0.62	0.63	0.64	0.65	0.62	0.62	0.62	0.63	0.64	0.65
Elasticity of labour supply to the sector	<b>0.21</b>	<b>0.27</b>	<b>0.33</b>	<b>0.33</b>	<b>0.23</b>	<b>0.02</b>	<b>0.67</b>	<b>0.54</b>	<b>0.33</b>	<b>-0.01</b>	<b>-0.52</b>	<b>-1.16</b>

Significance level: \*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Notes: Elasticities of labour supply to the sector are obtained from the two elasticities of job separation (estimated by CRE probit) and the share of recruitment from Adult Social Care (ASC) using Equation (4). Confidence intervals and standard errors are obtained by bootstrapping with 100 replications.

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