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The effects of minimum wage policy on the long-term care sector

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Personal Social Services Research Unit
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PSSRU Discussion Paper 2932
July 2017
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Acknowledgements

This is independent work commissioned and funded by the Policy Research Programme in the Department of Health from the Economics of Social and Health Care Research Unit (ESHCRU). ESHCRU is a joint collaboration between the University of York, London School of Economics and University of Kent. The views expressed are those of the authors and may not reflect those of the funders.

We would like to thank Skills for Care for sharing with us the National Minimum Dataset for Social Care (NMDC-SC), and Roy Price for helpful assistance on its use.

Abstract

Through the combined increase in the National Minimum Wage rate in October 2015 and the introduction of the National Living Wage in April 2016, workers aged 25 and over paid at minimum wage, had an over 10 percent pay raise. The long-term care (LTC) sector in England is a labour intensive, low pay sector, and as such, can be substantially affected by changes in minimum wage legislation. We assess the effects of this exogenous wage increase on independent LTC providers by looking at effects on wages, employment, employment conditions, productivity, and staff stability. Using data from the National Minimum Data Set for Social Care (NMDS-SC) and applying a 'before-after' analysis, we find that the substantial increase in minimum wage had a strong and positive effect on wages in the LTC sector, with quite substantial compression of the wage distribution at the lower end. Although, as in many other studies, the employment effect is elusive, we find that this might be at least partially explained by a negative effect on employment conditions. Everything else equal, minimum wage policy had a positive effect on employment on zero-hours contracts, meaning that it contributed significantly to slowing down the downward trend in employment on zero-hours contracts in the sector.

Introduction

The introduction of the National Living Wage (NLW) in April 2016 is a major labour market intervention, with the target of increasing wages for minimum wage workers aged 25 and over to 60 percent of median earnings by 2020. In 2015/16, it boosted the year-on year wage growth for minimum wage workers aged 25 and over by more than 10 per cent, through the combined October 2015 National Minimum Wage (NMW) rate increase (from £6.50 to £6.70) and the new April 2016 NLW rate of £7.20. This represents more than three times the 2015/16 growth in median earnings (of 3.1 percent), and was one of the highest increases in national minimum wage since its introduction in April 1999 (Low Pay Commission 2016).

These wage increases create payroll costs for employers, and stakeholders in several labour intensive, low-pay sectors – including long-term care (LTC) – expressed concerns about future sustainability (Low Pay Commission 2016). Compared to other sectors, the LTC sector faced an additional constraint to adjusting to the payroll cost increase – reduced public expenditure. A large proportion of services users are publicly funded, and local authorities with adult social care responsibilities experienced substantial cuts in social care funding over the last few years due to austerity measures (Fernandez, Snell et al. 2013, Luchinskaya, Simpson et al. 2017). Therefore, care providers lack the flexibility of passing cost increases on to charged fees, and changes to minimum wage legislation are expected to have a noticeable impact on the sector. The main concerns are that the increase in minimum wage will negatively affect employment, wage distribution, wage differentials, promotion prospects, employment conditions, quality of care, market sustainability and/or non-compliance with minimum wage regulation (Machin, Manning et al. 2003, Gardiner 2015a, Gardiner 2015b, Gardiner, Hussein 2015, Low Pay Commission 2016).

The majority of the studies on the impact of minimum wage have focused on employment effects. Starting with the 'new minimum wage research' at the beginning of the 1990s (Card 1992, Card, Krueger 1994, Card, Krueger 1995) a large strand of literature developed showing mainly that although minimum wage policy had significant positive effects on wages, it had no or very small negative effects on employment. These studies were based on either "natural experiments", by comparing a group of workers directly affected by a change in minimum wage (e.g. fast-food employers) with a similar group in a neighbouring area not affected by minimum wage, or state-panel approaches, exploiting the geographic variation in the share of workforce affected by minimum wage. Employment effects were 'elusive' despite studies focusing on groups with high shares of employees on minimum wage (e.g. teenagers or low educated workers) or low-wage sectors (e.g. hospitality, retail or social care), for which one would expect an upward bias due to

selection. A number of literature reviews and meta-studies give a good overview of this research strand (Metcalf 2008, Doucouliagos, Stanley 2009, Belman, Wolfson 2014, Linde Leonard, Stanley et al. 2014, Chletsos, Giotis 2015, Schmitt 2015).

A second strand of literature based on time-series analysis and applying panel data analysis to worker groups more likely to be affected by minimum wage policies (e.g. teenagers or less educated workers) supports, on the other hand, the view that minimum wages reduce employment of low-wage workers (Neumark, Wascher 2008, Neumark, Salas et al. 2014). Although, some recent studies argue that the negative employment effects of minimum wage are mainly due to geographical (and sectoral) trends in employment that are unrelated to minimum wage policy (Addison, Blackburn et al. 2009, Dube, Lester et al. 2010, Allegretto, Dube et al. 2011, Addison, Blackburn et al. 2012, Dube, Lester et al. 2016, Allegretto, Dube et al. 2017). After properly controlling for these trends, the studies find no evidence to suggest a negative effect on employment.

As presented in (Hirsch, Kaufman et al. 2015), economic theory offers a few explanations for the reason for the 'elusive employment effect' of minimum wage, depending on the theoretical approach. The standard competitive model predicts the main adjustment – to a wage level set above the competitive wage – to be through declining employment, but allows also for adjustment through increasing prices to consumers, reduction in non-pay benefits, reduction in training, and/or changes in the skill mix. In the institutional model, firms are assumed to operate below maximum efficiency because it is costly to identify, implement, and maintain practices that continuously maximise efficiency. In this context, a minimum-wage increase would give employers an incentive to improve efficiency (Kaufman 2010, Hirsch, Kaufman et al. 2015). Higher wages may also increase workers productivity by inducing them to work harder to ensure that they keep their job or by increasing job satisfaction (Akerlof 1982, Shapiro, Stiglitz 1984, Hirsch, Kaufman et al. 2015). Moreover, by increasing the spending power of low-wage workers, a minimum-wage increase might act as an economic stimulus, increasing demand for the firms' output (Aaronson, Agarwal et al. 2012, Hirsch, Kaufman et al. 2015). In the dynamic monopsony model, monopsony power comes from labour market frictions (i.e. employers face real costs associated with hiring new workers and workers incur costs to finding new jobs). These frictions put workers at a disadvantage; employers pay less than the competitive labour market wage, in order to maximise profit, and typically operate with unfilled vacancies. Therefore, a minimum wage set below the market competitive wage could raise both wages and employment (Hirsch, Kaufman et al. 2015, Schmitt 2015, Manning 2016).

Probably the first study that looked at the employment effects of minimum wage in the English LTC sector was (Machin, Manning et al. 2003). They surveyed care homes in England before and after the

introduction of the minimum wage in April 1999, and obtained data from about 2,000 care homes on workforce, care home characteristics, and managers view about minimum wage; their balanced panel included 641 care homes. They found that the minimum wage introduction had a compression effect at lower levels of the wage distribution, generating an about 30 percent spike at minimum wage. Moreover, they found a positive and significant effect on average wages and a modest negative effect on employment, but no effects on prices or productivity.

Given the low effects on employment, a few further studies tried to identify mechanisms that care home might have used to adjust to the NMW introduction. Using data from the same care home survey above, (Machin, Wilson 2004) find that minimum wage had no effect on home closures either; (Georgiadis 2013), however, find that the wage costs generated by the April 1999 NMW introduction were at least partly offset by lower monitoring expenses, measured as the ratio of supervisors to supervised employees. (Draca, Machin et al. 2011) using data from the Financial Analysis Made Easy (FAME) database, find evidence that the NMW introduction reduced the profitability of UK firms, and in particular care homes' profitability (i.e. gross profit margin).

The introduction of the NLW in April 2016 generated a new interest in the analysis of effects of minimum wage on the LTC care sector. (Gardiner 2016) using data from the National Minimum Data Set for Social Care (NMDS-SC) found no evidence that LTC providers reduced employment hours in order to offset the increased payroll cost after the NLW introduction, but an increased compression of the wage distribution at lower wage levels. A further study commissioned by the Low Pay Commission (Giupponi, Lindner et al. forthcoming) aims to replicate the earlier work of (Machin, Manning et al. 2003) and (Machin, Wilson 2004). Their results from primary data analysis of a survey of care homes in England show that the share of care assistants (i.e. care workers) paid below £7.20 decreased from about 60 percent to about 4 percent with the NLW introduction, with significant increases in average wages. However, despite the large effects on wages, they found no effects on employment, prices or productivity (Low Pay Commission 2016).

Our study adds to the literature on the effects of minimum wage in the LTC sector in several ways. Using the National Minimum Data Set of Social Care (NMDS-SC), a large and rich dataset of LTC establishments in England we are able to look not only at effects on care homes, but also on domiciliary care providers. We also discriminate for each service type between private (i.e. for-profit) and voluntary (i.e. not-for-profit) establishments. We believe the distinction to be important, as the voluntary sector has traditionally paid relatively higher hourly wages and offered better employment conditions (Skills for Care 2016a, Skills for Care 2016b). Finally, we explore an alternative adjustment mechanism, not captured by the previous literature, i.e. the share of care

workers employed on zero-hours contracts. Although under substantial criticism due to the arguments of low job and financial security offered to employees, care providers could use zero-hours contracts to decrease costs, by increasing the efficiency of labour input (CIPD 2013).

Our results show that the minimum wage increase had a strong and positive effect on the increase in the average wage at establishment level between July 2015 and September 2016. The minimum wage also generated quite a substantial compression at low wage levels. In care homes, for example, the share of workers at, or below, minimum wage increased from about 30 percent in July 2015 to about 40 percent in September 2016. The effects on employment are, nonetheless, insignificant. We find, however, that everything else equal, both the share of staff paid initially under the new minimum and the initial wage gap (i.e. the average increase in wages needed to bring staff pay to the mandatory minimum) had a negative effect on employment conditions, as measured by the share of staff on zero-hours contracts.

In the next sections, we give a brief overview of the minimum wage policy in the UK and the English LTC labour market, we present the dataset, the sample analysed, and the empirical strategy, and then discuss the results and conclude.

The National Minimum Wage in the UK

The National Minimum Wage (NMW) was introduced in April 1999 with two rates: £3.00 for workers aged 18 to 21, and £3.50 for workers aged 22 or older. Since October 2000 the rates have been adjusted yearly on advice from the Low Pay Commission, new rates have been introduced (i.e. one for workers aged 16 to 17 in October 2004, and one for apprentices in October 2010), and the age bands have been slightly changed. In October 2015 (i.e. the last adjustment before the introduction of the National Living Wage (NLW), there were four NMW hourly rates: £3.30 for apprentices, £3.87 for workers aged under 18, £5.30 for workers aged 18 to 20, and £6.70 for workers aged 21 and over.

The NLW was introduced in April 2016 for workers aged 25 and over at a rate of £7.20, representing 56 percent of median hourly earnings. It is different form the other rates in that it is adjusted yearly every April, and has a target of increasing wages for minimum wage workers aged 25 and over to 60 percent of median earnings by 2020. Conversely, the NMW rates are adjusted every October based on affordability, i.e. rates are negotiated between stakeholders to 'help as many low-paid workers as possible without damaging their employment prospects' (Low Pay Commission 2016).

The long-term care workforce

Skills for care estimated that the number of people working in the LTC sector in England in 2015 was about 1.43 million, filling about 1.55 million jobs. The majority of these, or about 80 percent, were jobs with independent sector employers (i.e. about 60 percent in the private sector and further 20 percent in the voluntary sector). In terms of service groups, most jobs were in residential care (i.e. care homes with or without nursing; 43 percent) and domiciliary care (e.g. home care; 42 percent) (Skills for Care 2016a).

Due to rising demand for care services, the workforce has grown steadily, even given reduced public funding for adult social care. Between 2009 and 2015, the number of LTC jobs has increased by about 3 percent per year (Skills for Care 2016a), while over the same period, public spending on LTC services in England dropped by about 17 percent (to about £14bn, after excluding the transfers from the NHS to adult social care made through the Better Care Fund) (The Health Foundation 2017).

Despite the strong increase in demand and employment, and probably reflecting the reduced public funding, pay and conditions in in the care sector in England rank rather poorly (Gardiner, Hussein 2015). The average hourly wage for care workers – the frontline of the direct care staff and representing over half (52 percent) of the jobs in the care sector – was £7.46 in 2015/16; this pay rates being at about the 10th percentile and less than half the mean UK hourly earnings. Care workers were paid slightly better in domiciliary care (£7.58; without taking into account travel time between clients) than in residential care (£7.20), and in statutory local authority jobs (£9.67) than in the independent sector (£7.35) (Skills for Care 2016a, Skills for Care 2016b, Low Pay Commission 2016). The distribution of wages in the LTC sector are also quite significantly compressed at low wage levels compared to other sectors, with the ratio of minimum wage to median pay (i.e. the 'bite') at about 78 percent in 2013, compared to only 52 percent overall (Gardiner, Hussein 2015).

Although majority of the LTC workforce are employed on permanent contracts (90 percent), a quarter of them (24 percent) where employed in 2015/16 on zero-hours contracts, with the highest proportion in domiciliary care (49 percent) and among care workers (58 percent) (Skills for Care 2016b). Opportunities for progression are also reported to be rather limited, with a flat hierarchy in which the ratio of senior care workers to care workers in domiciliary services declined from 7 to 4 percent between 2008 and 2012 (Gardiner, Hussein 2015).

Given such pay and conditions, it is rather surprising employment in the sector rose. The evidence seem to show that the majority of workers entering the sector have low education and limited access to higher paid jobs and/or are looking for part-time or flexible working time jobs that can be

fitted around other (caring) responsibilities. The majority of social care workers are female (80 percent), with mean age about 43, having a low level of formal qualifications, and with a growing number of migrants (Gardiner, Hussein 2015). However, despite the increase in employment, care providers are reporting high turnover (27 percent) and vacancy rates (7 percent), providing an important challenge to the provision of quality services (Skills for Care 2016b).

Methods and data

Following (Machin, Manning et al. 2003), we use two measurements for the importance of minimum wage policy for individual establishments: a) the share of workers employed by establishment i being paid less than the future minimum wage rate; and b) the 'wage gap', i.e. the relative increase in labour cost for establishment i needed to bring workers being paid less than the future minimum up to the minimum, or:

$$GAP_i = \frac{\sum_j max\left(W_{ji}^{min} - W_{ji}, 0\right)}{\sum_j W_{ji}} \quad (1)$$

where W_{ji} denotes the hourly wage earned by worker j in establishment i, and W_{ji}^{min} stands for the National Minimum Wage rate applying for worker j in establishment i.

For the empirical analysis, we aim to establish if, everything else equal, establishments that initially had the highest share of workers paid less than the future minimum wage and those with the highest wage gap were indeed affected mostly by the increase in the wage floor.

The wage equation has the form:

$$\Delta W_{i,t} = \alpha_1 + \beta_1 MW_{i,t-1} + \delta_1 X_{i,t-1} + \varepsilon_{1i,t} \quad (2)$$

where $\Delta W_{i,t}$ is the change in the log of average hourly wage for establishment i between $t-1$ (i.e. July 2015) and t (i.e. September 2016), $MW_{i,t-1}$ stands for one of the two measurements defined above for capturing the importance of minimum wage policy for establishment i in the period $t-1$, $X_{i,t-1}$ are worker, establishment level and regional characteristics in the period $t-1$ that could affect the wages, and $\varepsilon_{i,t}$ is the error term.

When estimating the effect of minimum wage on employment, we control also for the change in the log of the clients served by the establishment ($\Delta D_{i,t}$), as an increase in clients (i.e. demand) may have a positive effect on employment:

$$\Delta N_{i,t} = \alpha_2 + \beta_2 MW_{i,t-1} + \gamma_2 \Delta D_{i,t} + \delta_2 X_{i,t-1} + \varepsilon_{2i,t} \quad (3)$$

The equation used to assess further potential effects of minimum wage on employment conditions (i.e. share of workers employed on zero-hours contracts), skill mix (i.e. share of staff with nursing qualification), productivity (i.e. service users per staff rate), turnover rate and vacancy rate – denoted by Y_i – is similar to Equation 2, but includes an additional control for the initial state of the outcome of interest ($Y_{i,t}$), as this can determine the size of the change:

$$\Delta Y_{i,t} = \alpha_3 + \beta_3 MW_{i,t-1} + \gamma_3 Y_{i,t} + \delta_3 X_{i,t-1} + \varepsilon_{3i,t} \quad (4)$$

Equations 2, 3 and 4 are estimated using Ordinary Least Squares (OLS).

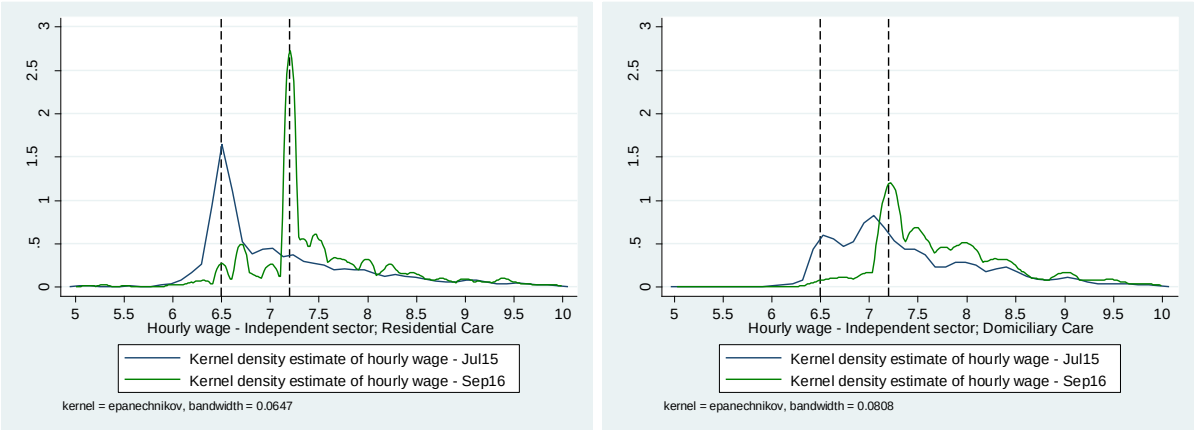
For this analysis, we use data from the National Minimum Data Set for Social Care (NMDS-SC), an online database on the LTC workforce across England collected by Skills for Care, and holding information on around 25,000 establishments and 700,000 workers. The dataset is updated regularly by employers, and provides rich information about establishment characteristics (e.g. location, type of care provided, capacity, occupancy, and client type) and workforce (e.g. demographic characteristics, job role, contracted hours, pay, qualifications, and training). The NMDS-SC is the main source of workforce information for the LTC sector in England. However, as data is employer reported and not verified by any other records, it is likely to be affected by reporting errors and should, therefore, treated with caution (Gardiner 2016, Hussein 2017).

There are two NMDS-SC analysis files, one at establishment level and one at worker level, both being fully anonymised. We used mainly establishment level data for the analysis, but worker data is used to generate establishment level variables capturing the workforce age and gender structure, wages and contract types. We focused the analysis on the period July 2015 to September 2016 and, thus, capturing the October 2015 NMW update and the introduction of the NLW in April 2016. We allowed a six month period after the NLW introduction, in order to capture changes for providers who updated their NMDS-SC entries with a delay. We excluded provider records that were not updated for a long time: for the July 2015 cut-off, records that were not updated since the last NMW update (i.e. October 2014), and for the September 2016 cut-off, records that were not updated since April 2016. After excluding also establishments with incomplete data, our worker sample includes for July 2015 about 190,000 workers in 6,000 establishments, while for September 2016 about 170,000 workers in 5,500 establishments.

As illustrated by kernel density distributions, the increase in national minimum wage during this period has generated quite a substantial compression of the wage distribution around the new NLW level in the case of LTC workers employed in residential care, with rather limited spillover to higher wage rates (see Figure 1). While in July 2015 around 30 percent of residential care employees had an

hourly wage at or below the adult NMW rate (i.e. £6.50), in September 2016 about 40 percent of them were paid at or below the adult NLW rate of £7.20.[1] In the case of domiciliary care employees, the wage distribution compression has also been substantial: in July 2015 around 15 percent of them had an hourly wage at or below the adult NMW rate, while in September 2016 about 30 percent had hourly wages at or below the adult NLW. Nonetheless, in the case of domiciliary care employees, Figure 1 reveals also some spillover to higher hourly wages, mainly around £7.50 and £8.00.[2]

Figure 1. Kernel density estimates of LTC workers hourly wage employed in the independent sector by care type – July 2015 and September 2016



Note: The sample includes LTC workers employed by independent sector providers with up-to-date records. Source: Skills for Care, NMDS-SC Worker file.

Table 1 presents differences between the beginning and the end of the observed period for the dependent outcomes of interest, without controlling for any influencing factors. We can observe that in July 2015 the lowest average hourly wages were in residential care and private domiciliary care, all around £7.70-7.80, while in voluntary domiciliary care providers paid on average £1.30 (or 16 percent) higher hourly wages. Average hourly wages have increased significantly between July 2015 and September 2016. The highest increase being for residential care employees (about 36p, or about 4.6 percent). This increase represents less than half the 10.8 percent pay rise experienced by the lowest paid care workers aged 25 and over, and confirms the substantial compression in the wage distribution around minimum wage illustrated in Figure 1. This could also partly explain the fact that employment was rather unaffected.

[1] See for comparison (Gardiner 2016).

[2] It is rather interesting to note that while the July 2015 wage distribution for domiciliary care employees had the highest peak at £7.00 per hour (i.e. £0.50 above the NMW rate at that time), the September 2016 distribution peaked at NLW level. That is probably showing that domiciliary care providers might have used to pay wages above the minimum in order to compensate for travel time, but since the introduction of the NLW, due to increased operation costs, this seems to be less likely the case.

Another potential adjustment mechanism is through contractual conditions, with zero-hours contracts potentially allowing service providers to allocate labour input more cost-effectively. Despite public perception, the data reveals that with the exception of private domiciliary care, the average share of workers employed on zero-hours contracts is not high in LTC. In July 2015 the share was 4 percent in private residential care, 5.4 percent in voluntary residential care, and 10 percent in voluntary domiciliary care. For all above employer groups the share decreased over the period analysed to less than 4 percent, most probably due to the large criticism of zero-hours contracts used by employers and the government attempts to limit employers abuse of such contracts (e.g. ban of exclusivity clauses) (Department for Business, Innovation and Skills 2015). For private domiciliary care providers the average share of workers on a zero-hours contract was rather stable over the period, at about 44 percent. Nonetheless, we have to mention substantial differences between individual service providers in the use of zero-hours contracts within service types.

Regarding the share of staff with nursing qualification, this was highest for private residential care (about 5.5 percent), mostly due to the fact that nursing homes are predominantly operated by for-profit providers, and that domiciliary LTC services with nursing are rather rare. The skill mix was also constant over the period analysed for all provider groups.

Productivity, as measured by the service users per staff rate, was highest for the voluntary sector; in July 2015, this had an average of 2.07 for voluntary residential care establishments (compared to 1.67 in the private sector) and 2.67 for voluntary domiciliary care establishments (compared to 0.93 in the private sector). The rather substantial difference in productivity between the two sectors in domiciliary care provision would explain (at least partially) the hourly pay premium earned by workers in voluntary domiciliary care.

Despite the quite substantial increase in wages, staff stability and vacancies seem to have not improved. Staff turnover was highest and increasing between July 2015 and September 2016 in the private sector: from 23 percent to 27 percent in private residential care, and from about 28 to 30 percent in private domiciliary care, while in the voluntary sector turnover was somewhat lower (around 18-19 percent) and rather stable. At the same time, the vacancy rates were on average stable, with the highest in private domiciliary care (8.5 percent), and about half that in the other provision groups (about 4 percent).

Some features of the establishment sample are described in Table 2. The share of workers paid in July 2015 less than the October 2015/April 2016 mandated minimum was on average quite high: 50 percent in residential care and 30 percent in domiciliary care. However, the wage gap at July 2015

(i.e. the relative increase in wages needed to bring workers being paid less than the future October 2015/April 2016 minimum up to the that mandated minimum) was rather small (3.9 percent in residential care and 1.8 percent in domiciliary care). It is important to notethat the wage gap was also smaller than the average hourly wage increase in the analysed period (4.9 percent in residential care and 3.3 percent in domiciliary care) and, thus, confirming that providers increased wages more than required and/or increased wages for employees paid above minimum as well (i.e. spillover effect); see also (Gardiner 2016).

In terms of other characteristics of the sample, the mean worker age at July 2015 was about 42 years, with about 80 percent of staff being female, and majority of staff being care workers (i.e. frontline, direct care staff), about 65 percent in residential and 77 percent in domiciliary care establishments. Moreover, the majority of establishments are small (i.e. 10 to 49 workers; 63 percent of residential and 48 percent of domiciliary care establishments). We also control for service user type, change in LA-level social care financing (proxied by the difference in residential care costs between 2015/16 and 2014/15) and changes in the local labour market (proxied by the difference in the LA-level Job Seeker Allowance uptake rate).

Results

OLS estimation results of Equations 2, 3 and 4 for each outcome of interest and service type are presented in Table 3. For brevity we present only coefficients for the two variables capturing the importance of minimum wage policy for individual establishments, i.e. the share of workers paid less than the future mandatory minimum wage (i.e. October 2015/April 2016) and the wage gap at July 2015.[3] In order to allow for differential effects by sector, we interacted the two above variables with the sector variable (i.e. private or voluntary). All estimations include controls for worker characteristics (i.e. mean worker age, the share of female workers, and the share of care workers in total staff), establishment characteristics (i.e. size, sector, and user type), and local area characteristics (i.e. the change in LA-level social care financing as measured by the change in residential care unit costs over the analysed period, and the change in the local unemployment level). We also use regional dummies to control for any further geographic differences in social-demographic characteristics not captured by the above factors.

For both service types and sectors there is evidence that establishments with a higher share of low-wage workers in the months before the increase in the wage floor experienced a higher average

[3] The full set of estimation results are available from the authors upon request.

wage increase, the effects are statistically significant and large. A residential care establishment with 50 percent of its workers being paid in July 2015 less than the future minimum wage (i.e. an average residential care establishment) experienced average wage growth of about 3.6 percent higher than one that had 10 percent of its workers paid less than the future minimum wage.[4] This is sizable given that the average wage growth during the period was about 4.9 percent, and is comparable with the effect the minimum wage introduction had in 1999 on care homes found by (Machin, Manning et al. 2003).

In comparison, a domiciliary care establishment with 30 percent of its workers being paid in July 2015 less than the future minimum wage (i.e. an average domiciliary care establishment) experienced average wage growth of about 1.6 percent higher than one that had 10 percent of its workers paid less than minimum, while the average wage growth in domiciliary care during the period was about 3.3 percent.[5]

Similar to many previous studies on the effects of minimum wage – for an overview see (Manning 2016) – our results confirm the 'elusiveness' of employment effects; for both sectors and service types, the estimated effects on employment are statistically insignificant. This is not really surprising. Due to cuts in publicly funded social care, providers were likely to use staffing rather efficiently. Decreasing staffing further, would probably not be possible without seriously affecting quality, which is regularly monitored by the Care Quality Commission (CQC).

One potential adjustment mechanism LTC providers might use to compensate for the increase in operation cost is increasing the efficiency of labour input in the production of care services by switching to more flexible contractual agreements (e.g. zero-hours contracts). Our results suggest that everything else equal, the share of low-wage workers in the months before the increase in the wage floor and the wage gap had a positive effect on the change in the share of workers employed on zero-hours contracts.

The effects are not statistically different by sector, but are larger for domiciliary care compared to residential care. A residential care establishment with 50 percent of its workers being paid in July 2015 less than the future minimum wage (i.e. an average residential care establishment) experienced a 0.8 percentage points higher change in zero-hours contract rate than one that had 10 percent of its workers paid less than the future minimum.[6] The effect is quite large, given the fact

[4] The calculation is 0.090x(0.5-0.1)=0.036.
[5] The calculation is 0.081x(0.3-0.1)=0.016.
[6] The calculation is 0.020x(0.5-0.1)=0.008.

that the average (unweighted) change over the period in the share of residential care workers employed on zero-hours contracts was -1.3 percent (i.e. from 4.5 percent to 3.2 percent).

A domiciliary care establishment with 30 percent of its workers being paid in July 2015 less than the future minimum wage (i.e. an average domiciliary care establishment) experienced a 2.6 percentage points higher change in zero-hours contract rate than one that had 10 percent of its workers paid less than the future minimum.[7] Again, the effect is quite large, considering that the average (unweighted) change over the period in the share of domiciliary care workers employed on zero-hours contracts was -3.1 percent.

In general, our findings show that the increase in the wage floor had an important effect on slowing down the downward trend in employment on zero-hours contracts.

In terms of other outcomes, we find that the minimum wage policy had no significant effect on changes in productivity (i.e. the service user per staff rate) or skill mix (i.e. the share of staff with nursing qualification), but had a positive effect on changes in turnover and vacancy rates in the case of voluntary residential care establishments. Given the reputation of the voluntary sector to offer better employment conditions, these results seem quite surprising. However, due to the compression of the wage distribution at low wage levels, the wage difference in pay between the private and voluntary residential care providers has become relatively less important (see Table 1). Moreover, descriptive statistics in Table 1 show that on average a voluntary residential care worker had to cater for more clients (i.e. about 2.05) compared to a private residential care worker (i.e. 1.67). All this might have helped private care homes to become more attractive to care staff. Nonetheless, as of September 2016 voluntary residential care establishments still had an about 8 percentage point lower turnover rate compared to private ones.

Conclusions

The introduction of the National Living Wage in April 2016 is a major policy intervention on the labour market, with the aim of increasing the minimum wage for workers aged 25 and over to 60 percent of median pay. Such a significant increase in the wage floor has prompted concerns about potential negative effects on employment and affordability, in particular a labour intensive, low-pay sector such as LTC.

[7] The calculation is 0.129x(0.3-0.1)=0.022.

The results of our analysis confirm the findings of previous studies that despite sizable effects on wages, minimum wage policy had no statistically significant effect on employment. This may not be surprising, as care providers may have initially used staffing quite efficiently due to the limited public funding of social care services. Reducing staffing further might not have been possible without affecting the quality of service provision.

The only notable negative effect of minimum wage policy we found was on employment conditions, more specifically on slowing down the downward trend in employment on zero-hours contracts. This finding provides an explanation for the 'elusive' employment effect that has not been previously explored.

Although there is no evidence of important negative effects of minimum wage policy, the pressure on the long-term care sector is likely to increase in the coming years, due to limited public expenditure and the planed rapid increase in National Living Wage. The way care providers will manage to adjust to this challenges as well as the effects of wage increases on the insufficient labour supply and low retention rates in the long-term care sector are important question for future research.

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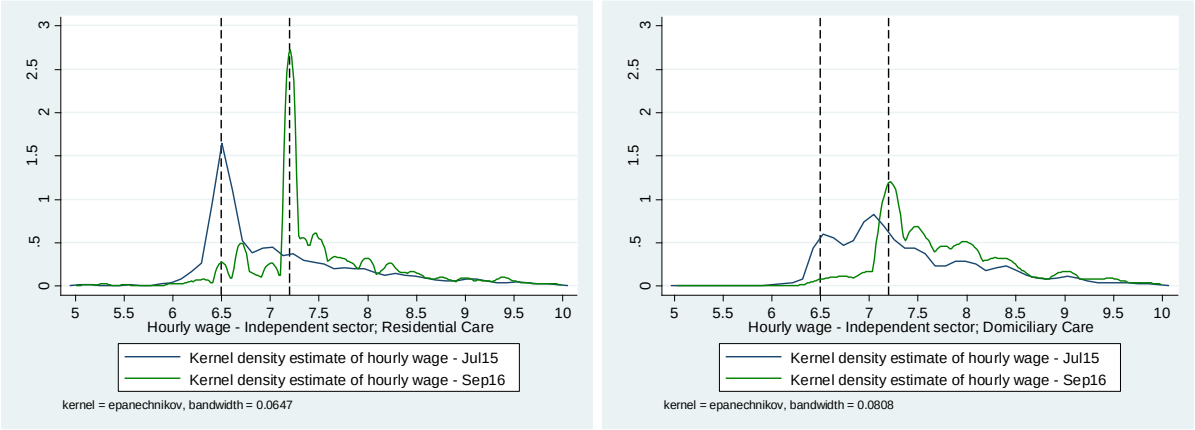
Figure 1. Kernel density estimates of LTC workers hourly wage employed in the independent sector by care type – July 2015 and September 2016



Note: The sample includes LTC workers employed by independent sector providers with up-to-date records. Source: Skills for Care, NMDS-SC Worker file.

Table 1. Changes in outcomes

Variable	Service type	Sector	Obs	Sep16	Jul15	Diff	p-val
Mean hourly wage	Residential care	Private	1,840	8.070	7.714	0.356	0.000
		Voluntary	822	8.187	7.823	0.364	0.000
	Domiciliary care	Private	349	8.121	7.816	0.305	0.000
		Voluntary	340	9.343	9.097	0.245	0.148
No. of employees	Residential care	Private	2,276	35.892	35.782	0.111	0.909
		Voluntary	937	21.934	21.571	0.363	0.724
	Domiciliary care	Private	521	50.772	49.693	1.079	0.758
		Voluntary	375	20.267	19.880	0.387	0.869
Zero-hours contract rate	Residential care	Private	1,554	0.037	0.040	-0.003	0.383
		Voluntary	789	0.021	0.054	-0.033	0.000
	Domiciliary care	Private	277	0.446	0.433	0.013	0.712
		Voluntary	327	0.033	0.101	-0.068	0.000
Share of staff with nursing qualification	Residential care	Private	914	0.055	0.057	-0.002	0.640
		Voluntary	316	0.016	0.016	-0.001	0.879
	Domiciliary care	Private	156	0.015	0.015	0.000	0.998
		Voluntary	100	0.011	0.009	0.002	0.676
Service users per staff rate	Residential care	Private	2,276	1.672	1.669	0.003	0.913
		Voluntary	937	2.052	2.065	-0.013	0.804
	Domiciliary care	Private	521	0.930	0.926	0.004	0.945
		Voluntary	375	2.315	2.669	-0.354	0.003
Turnover rate	Residential care	Private	1,811	0.268	0.229	0.039	0.000
		Voluntary	501	0.185	0.171	0.014	0.257
	Domiciliary care	Private	357	0.295	0.276	0.019	0.291
		Voluntary	108	0.187	0.211	-0.024	0.399
Vacancy rate	Residential care	Private	1,274	0.038	0.039	-0.001	0.833
		Voluntary	411	0.047	0.040	0.007	0.214
	Domiciliary care	Private	282	0.085	0.087	-0.003	0.793
		Voluntary	69	0.040	0.021	0.019	0.132

Table 2. Descriptive statistics

	Residential care			Domiciliary care		
Variable	Obs	Mean	StdDev	Obs	Mean	StdDev
Diff in log of mean wage (Sep16-Jul15)	2,662	0.047	0.065	689	0.035	0.114
Difference on log of employment (Sep16-Jul15)	3,213	0.008	0.234	896	0.007	0.402
Diff in zero-hours contracts (ZHC) rate (Sep16-Jul15)	2,343	-0.013	0.130	604	-0.031	0.181
Diff in share of staff with nursing qualif. (Sep16-Jul15)	1,230	-0.002	0.027	256	0.001	0.017
Diff in service users per staff rate (Sep16-Jul15)	3,213	0.015	0.393	896	0.022	0.544
Difference in turnover rate (Sep16-Jul15)	2,312	0.034	0.202	465	0.009	0.208
Difference in vacancy rate (Sep16-Jul15)	1,685	0.001	0.064	351	0.002	0.074
Share of workers paid less than Apr16 minimum (Jul15)	3,213	0.503	0.335	896	0.307	0.343
Initial wage gap (Jul15)	3,213	0.039	0.047	896	0.018	0.029
Diff in log of clients (Sep16-Jul15)	3,213	0.008	0.161	896	0.089	0.445
Total clients (Jul15)	3,213	24.517	26.204	896	97.481	281.273
Total clients (Sep16)	3,213	24.705	26.244	896	96.098	276.564
Mean worker age (Jul15)	3,213	41.857	5.132	896	42.054	5.712
Share of female workers (Jul15)	3,213	0.793	0.177	896	0.803	0.205
Share of care workers in total staff (Jul15)	3,213	0.645	0.200	896	0.772	0.241
Establishment size: micro (1-9 workers)	3,213	0.187	0.390	896	0.289	0.454
Establishment size: small (10-49 workers)	3,213	0.625	0.484	896	0.477	0.500
Establishment size: medium/large (50+ workers)	3,213	0.188	0.391	896	0.234	0.424
Sector: private	3,213	0.708	0.455	896	0.581	0.494
Sector: voluntary	3,213	0.292	0.455	896	0.419	0.494
User type: old age/dementia	3,213	0.358	0.479	896	0.083	0.275
User type: young adults	3,213	0.502	0.500	896	0.199	0.399
User type: mixed	3,213	0.140	0.347	896	0.719	0.450
Diff in log of res. care Unit Cost (15/16-14/15; LA level)	3,213	0.012	0.112	896	0.016	0.112
Residential care Unit Cost (2014/15; LA level)	3,213	747.945	177.703	896	776.880	181.328
Residential care Unit Cost (2015/16; LA level)	3,213	757.976	189.108	896	790.880	194.098
Diff in JSA rate (x100) (Sep16-Jul15; LA level)	3,213	-0.682	0.368	896	-0.641	0.343
Job Seeker Allowance (JSA) rate (x100) (Jul15; LA level)	3,213	1.815	0.940	896	1.755	0.881
Job Seeker Allowance (JSA) rate (x100) (Sep16; LA level)	3,213	1.133	0.672	896	1.114	0.633
Region: Eastern	3,213	0.112	0.315	896	0.137	0.344
Region: East Midlands	3,213	0.078	0.269	896	0.068	0.252
Region: London	3,213	0.065	0.247	896	0.110	0.314
Region: North East	3,213	0.070	0.256	896	0.061	0.240
Region: North West	3,213	0.154	0.361	896	0.116	0.320
Region: South East	3,213	0.176	0.380	896	0.196	0.398
Region: South West	3,213	0.119	0.323	896	0.088	0.284
Region: West Midlands	3,213	0.122	0.327	896	0.136	0.343
Region: Yorkshire and the Humber	3,213	0.104	0.306	896	0.086	0.280

Table 3. OLS estimation results of minimum wage effects

VARIABLES	Diff in log of mean wage (Sep16-Jul15)	Diff in log of employment (Sep16-Jul15)	Diff in ZH contract rate (Sep16-Jul15)	Diff in share with nurs. qual. (Sep16-Jul15)	Diff in SU per staff rate (Sep16-Jul15)	Diff in turnover rate (Sep16-Jul15)	Diff in vacancy rate (Sep16-Jul15)
				Residential Care			
Share of workers paid less than Apr16 minimum (Jul15) x Private Sector	0.091***	0.002	0.017**	0.005	-0.012	0.029*	0.005
	(0.006)	(0.021)	(0.007)	(0.004)	(0.032)	(0.016)	(0.006)
Share of workers paid less than Apr16 minimum (Jul15) x Voluntary Sector	0.089***	-0.001	0.024***	0.002	-0.010	0.092***	0.043***
	(0.005)	(0.020)	(0.007)	(0.003)	(0.037)	(0.032)	(0.016)
Observations	2,662	3,213	2,343	1,230	3,213	2,312	1,685
R-squared	0.251	0.042	0.640	0.103	0.046	0.204	0.228
Initial wage gap (Jul15) x Private Sector	0.918***	0.051	0.113	0.005	-0.100	0.077	-0.070
	(0.053)	(0.143)	(0.090)	(0.034)	(0.134)	(0.134)	(0.086)
Initial wage gap (Jul15) x Voluntary Sector	0.756***	-0.100	0.112**	0.013	-0.232	1.189***	0.697***
	(0.062)	(0.174)	(0.056)	(0.026)	(0.300)	(0.332)	(0.182)
Observations	2,662	3,213	2,343	1,230	3,213	2,312	1,685
R-squared	0.274	0.042	0.638	0.102	0.046	0.205	0.239
				Domiciliary Care			
Share of workers paid less than Apr16 minimum (Jul15) x Private Sector	0.074***	-0.043	0.120***	-0.001	-0.099*	-0.023	-0.010
	(0.011)	(0.040)	(0.040)	(0.003)	(0.052)	(0.030)	(0.013)
Share of workers paid less than Apr16 minimum (Jul15) x Voluntary Sector	0.096***	0.089	0.145***	0.001	-0.067	-0.024	0.032
	(0.020)	(0.074)	(0.033)	(0.006)	(0.100)	(0.071)	(0.030)
Observations	689	896	604	256	896	465	351
R-squared	0.063	0.072	0.285	0.057	0.074	0.204	0.215
Initial wage gap (Jul15) x Private Sector	0.857***	0.115	2.035***	-0.014	-0.581	-0.622*	-0.214
	(0.109)	(0.449)	(0.661)	(0.043)	(0.565)	(0.329)	(0.204)
Initial wage gap (Jul15) x Voluntary Sector	0.891***	1.222*	1.327***	-0.018	-0.768	-0.744	0.201
	(0.232)	(0.649)	(0.364)	(0.038)	(0.811)	(1.041)	(0.208)
Observations	689	896	604	256	896	465	351
R-squared	0.064	0.071	0.301	0.057	0.073	0.211	0.219

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All estimations include controls for worker characteristics (i.e. mean worker age, the share of female workers, and the share of care workers in total staff), establishment characteristics (i.e. size, sector, and user type), local area characteristics (i.e. the change in LA-level social care financing as measured by the change in residential care unit costs over the analysed period, and the change in the local unemployment level) as well as regional dummies.