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Drivers of Home Care Agency Closure: Evidence from England

RESEARCH

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ABSTRACT

Context: Hundreds of thousands of people in England with long-term care needs are supported by more than 10,000 home care agencies. However, little is known about the market dynamics of home care supply, either in England or internationally.

Objective: To understand the reasons for home care agency closure in England.

Method: Regression analysis of the future status of home care agencies open in the period 2015–2017 using a panel dataset of 98% of all agencies registered to provide care in England. Measures of quality, competition and other local area demand and supply factors, e.g. population, needs and rurality, were included in the analysis. Instrumental variable methods were used to address endogeneity in the relationship between closure and both competition and quality.

Findings: Fourteen point two per cent of home care agencies had closed one year after observation, with some differences observed by region. Regression analysis confirmed that higher competition and lower quality significantly increased closure likelihood. A new agency locating immediately next to the average provider would increase the likelihood of closure of the existing agency by a quarter. Independent agencies and those which supported a local population with higher needs had significantly reduced chance of closure.

Limitations: There were data limitations to the analysis, with no information on size of agencies and assumptions made on where they delivered care.

Implications: Competitive effects in home care markets must be carefully considered given the importance of ensuring equitable access to care. The findings also confirm the importance of quality regulation in long-term care.

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BACKGROUND

It is important to understand the supply side of the home care market in England, and internationally, given the general trend in long-term care policy towards provision of care in the home (Pavolini & Ranci, 2008; Campbell et al., 2015). In England, the demand for home care is large, with the market worth billions of pounds sterling (National Audit Office, 2021). On the supply side, there are over 10,000 agencies providing care, employing more than half a million people (Care Quality Commission, 2022a; Skills for Care, 2020). The number of agencies has increased rapidly over time and only a small number of local areas are not within range of a home care agency (Allan, 2021). This supply trend is similar to the US home health market (Wang, Leifheit-Limson et al., 2017). However, there are still disparities in access to care geographically (Wang, Leifheit-Limson et al., 2017; Allan, 2021), including inequality in access to high quality care between areas (Wang, Spatz et al., 2017; Joynt Maddox et al., 2018; Chen et al., 2020) and inequity in access to high quality care within areas for the US (Fashaw-Walters et al., 2022). Poorer quality services have cost implications, leading to greater utilisation of health care or other forms of long-term care (e.g. Cabin et al., 2014; Chen et al., 2020; Basu et al., 2021), and hospital stays can be extended from limited long-term care supply (Fernandez & Forder, 2008; Allan, Roland et al., 2021; Gridley et al., 2022).

Despite the importance, there is little research as to the barriers and drivers to supply of home care, particularly for England. Qualitative evidence points to workforce and location as being important factors influencing supply (Bottery et al., 2018; Allan & Darton, 2022), whilst for the US there is evidence that areas with higher income, larger older populations and poorer health indicators, e.g. obesity, had a greater likelihood of better access to home care agencies (Wang, Leifheit-Limson et al., 2017). Overall, understanding the factors that influence home care supply can help policy to better ensure continuity of care and equality in access and choice of care. This study therefore examined using regression analysis the factors that contributed to home care agency closure in England using data for all agencies over the period 2014–2018.

CONCEPTUAL MODEL

There are two key reasons as to why long-term care providers may fail. The first is economic unsustainability, i.e. long-term negative profits. In a market in equilibrium, if price were to fall, e.g. entry of another provider or another factor such as the squeeze on public funding seen during the 2010s in England, or costs to rise, e.g. increases in labour or fuel costs, economically one would expect this to lead to firm exit from the market. However, there are two reasons why firm withdrawal may not necessarily occur in the long-term care market in England: a) private, self-funding, i.e. prices in this section of the market can be above perfectly competitive levels because of asymmetric information (Akerlof, 1970; Salop, 1976; Allan, Gousia et al. 2021); and b) a persistent effect of investment with firms remaining in the market at prices below variable cost if there is a cost to (re-)entry and/or an exit cost (Dixit, 1989). This latter reason could explain the persistent threat of provider withdrawal observed in long-term care markets in England.

The extent to which providers will use their market power in the self-funder section of the market is unknown. As in the English care homes market (Forder & Allan, 2014), the majority of providers are for-profit. However, evidence suggests that there is likely to be at least some level of altruistic motive in provision, subject to profits being made (Kendall et al., 2003; Schlesinger & Gray, 2006; Allan & Darton, 2022). Generally, therefore, long-term care providers have tended not to be purely driven by profit (Knapp et al., 2001; Kendall et al., 2003), although this may increasingly be open to question with the presence of large chain providers and private equity in long-term care (Walker et al., 2022; Allan et al., 2022).

Overall, one would expect at least some use of market power by providers, particularly given that there are variations in observed quality ratings between providers, i.e. the market could be considered vertically differentiated. With both costs and revenue rising with quality, the relationship between profits and quality is not simple (Tirole, 1988). However, it has been shown that, with vertical differentiation, price above marginal cost is possible with a range of quality and profits being made by firms given certain assumptions (e.g. Shaked & Sutton, 1982; Gal-Or, 1983).

With variations in quality possible, low quality will be observed in a market. A second reason why provider withdrawal may occur is therefore the regulation of (poor) quality. The Care Quality Commission (CQC) monitors the quality of all long-term care providers in England using required information from providers, feedback from service users, ongoing monitoring and inspections. If a provider fails to meet the legal standards required then there are various stages of regulatory process for an agency such as: developing an action plan on quality improvements; being placed into special measures; and, ultimately, being closed (Care Quality Commission, 2020).

Given the above, we can therefore assume that the probability of closure of a home care provider is equal to:

$$prob\left(C_j = 1\right) = 1 - \left(prob\left(\pi_j \geq 0\right).prob\left(A_j = 0\right)\right) = 1 - \pi_j^0\left(1 - r\right) \quad (1)$$

Where $C_j = 0$ where a home care firm survives and $C_j = 1$ if it closes, π_j is (long-term) profitability of the firm, π_j^0 is the probability of profitability and r is the probability of direct regulatory action from CQC, A. The probability of regulatory action depends on observed quality at the time of inspection, $\widetilde{q}_j$, which is the actual optimal quality

of the firm, q_j^*, plus an (external) quality error term, q_j^e (Allan & Forder, 2015). The likelihood of direct regulatory action is inversely related to quality, i.e. $\frac{\partial r}{\partial q} < 0$. From this discussion of the theoretical considerations the following hypotheses were developed for analysis:

H1: Competition will have a positive effect on the likelihood of firm closure, $\frac{\partial C}{\partial N} > 0$.
H2: (Better) quality will have a negative effect on the likelihood of firm closure, $\frac{\partial C}{\partial q^*} < 0$.

METHODS

DATA

Data from the CQC national register of providers of health and long-term care for September of the years 2014–2018 was used for the analysis. Home care agencies in England, i.e. those employing staff to provide care, must be registered with the CQC by law. There are exceptions, e.g. personal assistants employed directly by the person they are caring (Care Quality Commission, 2022b), but these will only represent a small fraction of overall home care supply. All providers of home care registered with CQC were included in the analysis. After removing duplicate records, there were 7,852 agencies registered in 2014, 8,143 in 2015, 8,395 in 2016, 8,668 in 2017 and 9,079 in 2018. Agencies were matched over time using their unique agency identifier, in addition to an owner identifier and name and address of the service. Where possible, agencies that moved registered location within an area, which often also came with a change of agency identifier and sometimes even a change in name, agencies were treated as continuing to be open If they maintained the same owner identifier. A closure was identified when an agency with the same owner was no longer registered with the CQC from one year to the next. There was a likelihood of type I and type II errors in the data matching, e.g. of misidentifying a provider that is still open as a closure and *vice versa*. Overall, the likelihood of this was believed to be small and at an acceptable level for analysis.

The number and rate of closures of agencies by year are presented in Table 1. Nationally, the closure of home care providers is high, with generally more than one in six providers closing in any given year, although this reduced to nearly one in ten in 2017. Closures occurred reasonably consistently across all regions. However, East of England and London had below national average closures, and the North East above national average, for all four years observed.

Figure 1 compares the opening and closure rates for home care providers in England, shown with blue lines, with national opening and closure rates for all business, shown with red lines.[1] As would be expected given the rapid growth in home care supply, the opening rate of providers is greatly above the national rate, by about four per cent per year. Closures have also been well above the national rate in general, although in 2017 this trend was reversed. Overall, the figure provides evidence of a growing market with high churn. It also lends support to the notion that there was a good matching process linking providers across time using the CQC register, i.e. the data was appropriate for an analysis of home care provider closure.

HOME CARE COMPETITION

The count of home care agencies was utilised as the measure of competition.[2] Specifically, competition was measured between home care providers using the

	2014	2015	2016	2017
	TOTAL (PER CENT RATE)	TOTAL (PER CENT RATE)	TOTAL (PER CENT RATE)	TOTAL (PER CENT RATE)
East of England	119 (13.7)	150 (16.2)	138 (14.1)	108 (10.8)
East Midlands	123 (17.8)	122 (16.6)	122 (15.1)	109 (13.2)
London	165 (15.1)	176 (15.4)	171 (14.4)	132 (10.2)
North East	58 (18.0)	52 (16.5)	53 (17.2)	40 (13.2)
North West	157 (15.3)	199 (18.9)	157 (15.2)	123 (12.1)
South East	224 (16.9)	209 (15.6)	227 (16.5)	161 (11.3)
South West	124 (14.2)	129 (14.5)	132 (14.7)	109 (11.9)
West Midlands	143 (15.5)	163 (16.6)	156 (15.0)	109 (9.9)
Yorkshire & Humber	110 (15.0)	135 (17.7)	121 (16.0)	93 (11.9)
England	1223 (15.6)	1335 (16.4)	1277 (15.2)	984 (11.4)

Table 1 Closures of home care agencies in England by region, 2014–2017.

Notes: Columns list number of home care providers open in year t which had closed by year t+1, e.g. open in (September) 2014 but closed by (September) 2015.

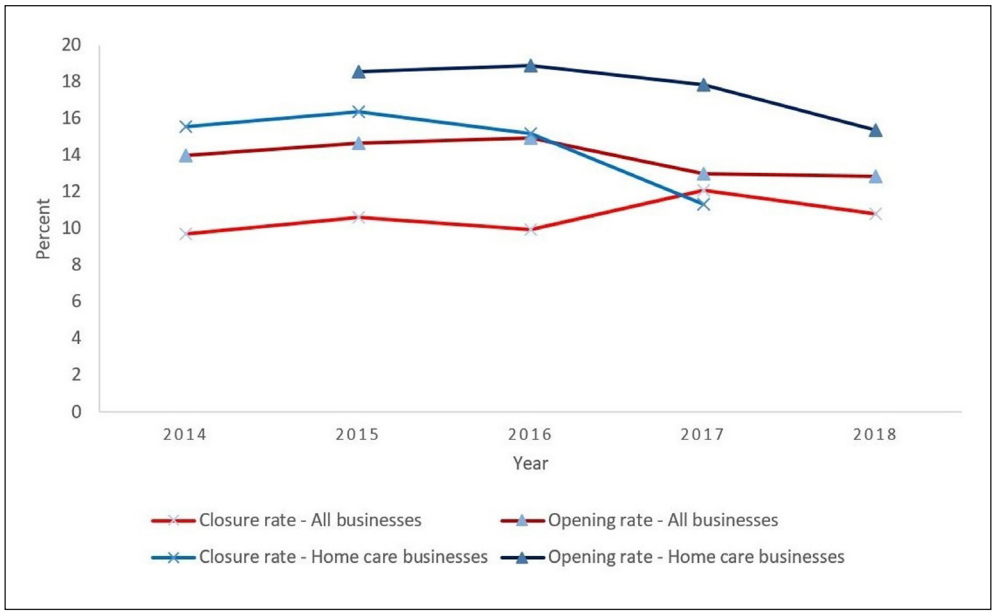

Figure 1 Opening and closure rates of businesses in England, home care and all businesses.
Note: Source for opening and closure rates (all businesses): Own calculations from ONS (2020b).

weighted count of providers within a certain radius of each agency's registered location, i.e. weighted supply:

$$DC_j^x = \sum_{i=1}^{n} y_{ji} n_i, \forall j \neq i \quad (2)$$

Where DC_j^x is equal to the i agencies that are within x radius of home care agency j, weighted by y.[3] Speed data was used to be able to measure the radius in time. To create this measure, the (straight-line) distance between home care providers' registered locations was converted from km to time using a predicted travel time per km for each Middle layer Super Output Area (MSOA) in England: $\Delta d_{ji} = |d_j - d_i||0.5t_j + 0.5t_i|$ for all i.[4] Finally, an inverse square root of travel time was used to weight DC_j, i.e. $y_{ji} = 1/\sqrt{\Delta d_{ji}}$. There is no information on expected size of markets for providers. A radius x equal to 10 minutes from registered location was utilised for the main analysis, but this was allowed to vary in a robustness check.

QUALITY

Quality ratings were available from the CQC. The CQC inspects and rates home care agencies based on the 'Mum test', which embeds personalisation into the regulatory system through an overarching consideration of whether someone would be happy with a family member receiving services from a provider (Care Quality Commission, 2017). Each provider receives a quality rating of either 'Inadequate', 'Requires improvement', 'Good' or 'Outstanding' (Care Quality Commission, 2017). For care homes, there is growing evidence supporting a relationship between overall CQC rating and residents' quality of life (Towers et al., 2019; Towers et al., 2021). Only a small proportion of home care agencies were rated as 'Inadequate' (e.g. 0.94 per cent in September 2017) and 'Outstanding' (1.84 per cent) and therefore we utilised a binary variable indicating high quality, i.e. 0 if a home was rated 'Inadequate' or 'Requires improvement', 1 if a home was rated 'Good' or 'Outstanding'.[5] The rating system began in late 2014 and just over 1,000 agencies had been rated by (September) 2015. A continuous predicted quality measure for all agencies in the years 2015–2017 was therefore included in the analysis using a regression of quality ratings which was performed on the independent variables and two instrumental variables to control for endogeneity (see below).

CONTROLS

The CQC register provides information on whom agencies are registered to support, i.e. those aged over 65, living with dementia or with learning disabilities or mental health issues; adults aged 18–64 and children. Also included in the analysis from the register was an indicator on the number of home care agencies that an organisation owned: 1, 2–9, 10–19 and 20 or more. However, there was no further information available in the register on those receiving care from specific agencies. Therefore, as proxies for the demand for care from an agency, control measures for the demand side of the home care market were included at a local level, specifically the Lower layer Super Output Area (LSOA, n = 32,844) where the agency was located. Data from various sources were used which can be found listed in the appendix Table A1. As proxies for market size, total population and rate of population over 85 were included. The decile of each LSOAs income deprivation index score for 2015 (lower deciles indicating lower income) and the proportion of eligible older population claiming Pension Credit benefit were included as proxy measures for (lack of) income. Proxy measures of needs included the decile of

each LSOA's health and disability deprivation index score (lower deciles indicating poorer health and disability) and the proportion of eligible population claiming Attendance Allowance benefit (available to those over 65 with long-term physical or mental disability). At LA-level (n = 152), the total number of hip fractures suffered by those aged over 65 was included as a further proxy for needs and real LA gross expenditure on non-residential care as a measure of public spending.

In addition to competition, a number of further measures of supply were included in the analysis: female Job seeker's allowance (JSA, an unemployment benefit) uptake at LSOA-level as an indicator of labour supply availability and cost; average house price at Middle layer Super Output Area (MSOA, n = 6,791) as a proxy for the cost to locating in the area by a provider; and the total number of (distance-weighted) care home beds within 10 minutes of the home care location as a measure of an alternative form of long-term care. A measure of rurality was included as an indicator of difficulty of supply, i.e. increased cost to provide the same service, specifically a binary variable indicating that the LSOA an agency was located in was classified as either urban (0) or rural (1). Finally, controls for region of England and year were included.

FINAL SAMPLE

Over the three year period 2015–2017 for the main analysis there were 25,204 home care agency observations. Of these, 536 agency observations (2.1%) were missing information on local area benefits data, hip fractures or predicted quality. These observations did not have a significant difference in their likelihood of closing compared to the agency observations with complete data ($\rho > 0.1$). The analysis proceeded with a final sample of 24,668 agency observations and assumed that the findings would be representative of all home care agencies.

DATA ANALYSIS

Assuming c_j is the latent probability of closure, i.e. a function of expected (negative) profits as described in (1), then a partial reduced form model of closure can be given by:

$$c_j = c_j\left(q_j^*, N_j, m_j, e_j\right) \quad (3)$$

Where m_i are exogenous demand and supply factors and e_i are unobservable exogenous factors that are inherent to the local market, e.g. local productivity rates. The stochastic equivalent to (3) was estimated:

$$\Pr\left(c_{jt}^* = 1\right) = F\left(x_{jt}'\beta + \mu_{jt}\right) \quad (4)$$

Where t is the wave of observation, x_{jt}' is the vector of competition, quality, demand and supply variables included in the model and μ_{jt} is an error term dependent on the unobservable dependent factors e_j.[6]

It is likely that the probability of closure will be endogenous to competition from alternative agencies and also to agency quality (Bresnahan, 1989; Forder & Allan, 2014). An instrumental variables (IV) approach was employed to address potential simultaneity. For competition, supply measures at higher geographies (i.e. greater radii around the agency) were utilised as instruments, assuming that any effect of home care supply at higher geographies would only affect likelihood of closure through its impact on supply at a lower geography, i.e. at a smaller radius around the provider. Specifically, for the number of (time-weighted) alternative providers of home care within a 10-minute radius of agency j the number of (time-weighted) agencies within 10–15, 15–20 and 40–50 minutes radii of provider j were used as the instruments.

Two instruments were included in estimating predicted quality, utilising a similar spatial argument to that used for competition. Specifically, the instruments used were average LA quality rating, excluding the quality rating of the provider, and Attendance allowance rate at MSOA-level, excluding the LSOA-level Attendance Allowance rate in which the provider was located.

The model of closure was estimated using an IV probit specification given the binary nature of the dependent variable and competition being treated as endogenous, also manually instrumenting for predicted quality and with standard errors clustered by agency. Taking advantage of the panel nature of the data, the closure model was further estimated to model for agency-level effects, specifically using population-average (PA) and random effects (RE) probit specifications, the latter allowing for random variation in agency effects which would make the PA specification inconsistent. In these models, both competition and quality were manually instrumented and heteroscedasticity robust standard errors were included.

A number of robustness checks using additional PA probit specifications of the closure model were also performed. First, the actual quality rating of providers was included, which limited observations. Second, quality ratings were excluded which increased the sample size to include 2014 agency observations and a proportion of missing observations from the main analysis (n = 280, 52.2%). Third, additional variables were added to the main analysis: median female hourly wage in 2015 prices at LA-level and date of agency's CQC registration. The former was included as an additional proxy for relative supply costs and the latter as a proxy for age. Registration date was not included in the main analysis as: a) date of registration is left censored as registration under new regulations only began in October 2010 and b) there were changes to provider registration over time. Finally, the marginal

effect of competition on closure likelihood was assessed using a) alternative time radii around each agency to measure local competition, specifically 2.5, 5, 7.5, 15 and 20 minutes and b) with the market radius defined by distance in km and not weighted for travel time.

The strength of instruments were assessed using F-tests of the instruments in first stage regressions of home care supply and quality. Potential over identification of the instruments was assessed using F-tests of the residuals from the first stage regressions of home care supply and quality when included in the model of closure. Endogeneity was assessed using either a Wald test provided in the IV probit model or from assessing the significance of instruments when included in a regression of the residuals from the closure model. Finally, in the PA and RE models the quality of the specification was assessed using a test of the significance of the square of predicted closures when included in the model of closures (Allan & Forder, 2015).

FINDINGS

Descriptive statistics for the analysis are presented in Table 2. Over the three-year period, 2015–2017, 14.2 per cent of home care providers closed in the year following observation. The average home care provider was located: within ten minutes of seventeen time-weighted alternative providers and 617 time-weighted care home beds; in an urban LSOA with a population of 1,830 of which 2.6 per cent were over 85, 1.1 per cent of women were claiming JSA and 14.2 per cent of over 65s and 23.8 per cent of over 60s were claiming needs and income benefits, respectively, in an MSOA with an average house price of £0.214m and in an LA with 248 hip fractures a year for over 65s and an average spend on community adult social care of over £25.1m a year. The majority (62.0 per cent) of agencies were sole organisations, with 11.2 per cent of providers being part of an organisation with twenty or more agencies. Eighty-three per cent of agencies were registered to provide services to older people and 14.6 per cent were registered to provide services to children.

The results of estimating the closure model are presented in Table 3. The first column of results are when estimating a probit model using the cross-section of the data, ignoring their panel nature, whilst the second and third columns present the PA and RE probit model results. Overall, the results are as expected and confirmed the theoretical hypotheses. Greater competition in terms of the number of providers located nearby increased the likelihood of closure, whereas good quality significantly decreased the likelihood of closure. In all three models, the marginal effect of a one percent increase in predicted quality was a 3.9 per cent reduction in the likelihood of closure. Other demand factors which significantly influenced the likelihood of closure were measures of need, i.e. attendance allowance uptake and hip fractures at LA-level, with higher levels of both reducing the likelihood of closure. On the supply-side, agencies which are part of an organisation were much more likely to close than sole providers. The results also shows limited evidence that providers registered to provide care to younger adults were more likely to close than those registered to provide care to older people. Finally, the number of care home beds in the market significantly reduced the likelihood of closure. In terms of the adequacy of the IV estimation, the instruments were strong, but there was over identification in the quality instruments in two of the three models. There was evidence of endogeneity and only weak evidence of random effects in the model.

The findings of the robustness checks confirmed the main analysis (Table 4). The marginal effect of a high ('Good'/'Outstanding') compared to low ('Inadequate'/'Requires improvement') quality rating on closure likelihood was –7.9 per cent. Findings were similar to the main analysis when including 2014 agency observations, i.e. with quality ratings excluded. Female median wage at LA-level had a limited significant positive effect on the likelihood of closure. The effect of age of registration on closure was similar to that found for care homes with a quadratic relationship that is opposite to the general closure literature: newer providers were less likely to close than older providers (see also Allan & Forder, 2015). However, the effect was quadratic in nature and predicted chance of closure was maximised at 15.4 per cent for agencies that had been registered for three years.

Marginal effects for competition from the three main specifications of results were very similar (Table 5). A one per cent increase in time-weighted home care agencies increased the likelihood of closure by 4.5 per cent in the PA specification (95% confidence interval: 0.8%–8.3%). This marginal effect suggests that one new home care provider locating next to the average existing agency increased the likelihood of closure of the existing firm by 26.1 per cent, everything else being equal. This effect diminishes as time to new home care provider increased, e.g. to 8.3 per cent if the new provider were to locate 10 minutes away from the existing agency.[7] The marginal effect of competition from the models included as robustness checks were also generally similar in size. As further robustness checks, the effect of competition on closure probability was assessed when a) varying the size of the market and b) allowing the competition market radius to be measured in km and not weighted by travel time. A significant and similar sized effect was found for 5- and 7.5-minute radii, whereas competition did not significantly affect likelihood of care home closure for briefer (2.5 mins) and longer (15 and 20 mins) time radii. The effect of competition with a market defined at

VARIABLE	n	MEAN	STD.DEV.	MIN.	MAX.
Dependent variable					
Home care provider closed	24,668	0.142	0.349	0	1
Endogenous variables					
Number of Providers, 10 mins (weighted)	24,668	17.21	13.83	0	89.84
Predicted quality	24,668	0.753	0.167	0.002	1.12
Quality rating ('Good'/'Outstanding')	11,144	0.799	0.401	0	1
Independent variables – demand					
Total population (LSOA)	24,668	1830.2	494.1	840	11514
Population 85+ rate (LSOA)	24,668	2.639	1.988	0	18.82
Income deprivation score decile (LSOA)	24,668	4.83	2.68	1	10
Pension credit 60+ rate (LSOA)	24,668	23.78	16.12	0	123.32
Health & disability deprivation score decile (LSOA)	24,668	4.86	2.80	1	10
Attendance allowance 65+ rate (LSOA)	24,668	14.18	5.214	0	46.36
Hip fractures 65+ (LA)	24,668	247.9	178.9	38	967
LA non-residential care ASC expenditure (£000s)	24,668	25133.7	17635.2	590.7	75135.6
Independent variables – supply					
Care home beds, 10 mins (weighted)	24,668	617.2	351.2	0	2225.0
Female JSA rate (LSOA)	24,668	1.121	1.119	0	9.615
Average house price, £ (MSOA)	24,668	213538	141676	27513.9	2872631
Rural location (LSOA)	24,668	0.124	0.329	0	1
Size of organisation, 1 provider	24,668	0.620	0.486	0	1
Size of organisation, 2–9 providers	24,668	0.216	0.411	0	1
Size of organisation, 10–19 providers	24,668	0.052	0.222	0	1
Size of organisation, 20+ providers	24,668	0.112	0.316	0	1
Registration: Older people	24,668	0.834	0.372	0	1
Registration: Dementia	24,668	0.676	0.468	0	1
Registration: Learning disability	24,668	0.641	0.480	0	1
Registration: Mental health	24,668	0.558	0.497	0	1
Registration: Adults 18–64	24,668	0.697	0.460	0	1
Registration: Children	24,668	0.146	0.353	0	1
Instruments					
Number of providers, 10–15 mins (weighted)	24,668	7.397	7.390	0	43.54
Number of providers, 15–20 mins (weighted)	24,668	7.615	7.236	0	44.08
Number of providers, 40–50 mins (weighted)	24,668	17.85	14.02	0	71.04
Average LA quality	24,668	0.756	0.162	0	1
Attendance allowance 65+ rate (MSOA)	24,668	13.35	3.595	2.459	31.27

Table 2 Descriptive statistics.

Notes: Std. Dev. = standard deviation, Min. = minimum, Max. = maximum. LSOA = Lower layer Super Output Area, MSOA = Middle layer Super Output Area, LA = Local authority, JSA = Job Seeker's Allowance.

10 km was significant but smaller in effect size, with an average existing provider having an increased likelihood of closure of 20.3 per cent if a new provider located in their immediate vicinity.

VARIABLES	(1)	(2)	(3)
	IV PROBIT	PA PROBIT	RE PROBIT
Home care supply			
Providers, 10 mins (log)	0.202** (0.085)	0.207** (0.086)	0.219** (0.092)
Home care quality			
Predicted quality (log)	−0.177*** (0.037)	−0.177*** (0.037)	−0.182*** (0.039)
Demand			
Total population (log)	−0.046 (0.048)	−0.047 (0.048)	−0.048 (0.051)
Population 85+ rate	0.007 (0.008)	0.008 (0.008)	0.009 (0.009)
Income deprivation score	0.009 (0.009)	0.009 (0.009)	0.009 (0.009)
Pension credit 60+ rate	0.001 (0.001)	0.001 (0.001)	0.001 (0.002)
Health deprivation score	−0.007 (0.008)	−0.007 (0.008)	−0.007 (0.009)
Attendance allowance 65+ rate	−0.007*** (0.003)	−0.007*** (0.003)	−0.008*** (0.003)
Hip fractures (log)	−0.039* (0.021)	−0.038* (0.021)	−0.039* (0.023)
LA non-residential care expenditure (log)	0.018 (0.018)	0.017 (0.018)	0.020 (0.019)
Supply			
Care home beds, 10 mins (log)	−0.172** (0.069)	−0.177** (0.070)	−0.187** (0.074)
Female JSA rate	0.018 (0.013)	0.019 (0.013)	0.019 (0.013)
Average house price (log)	0.0002 (0.038)	0.002 (0.038)	0.002 (0.040)
Rural location	0.046 (0.051)	0.045 (0.050)	0.048 (0.054)
Size of organisation, 2–9	0.394*** (0.025)	0.397*** (0.025)	0.423*** (0.033)
Size of organisation, 10–19	0.437*** (0.042)	0.439*** (0.042)	0.465*** (0.048)
Size of organisation, 20+	0.261*** (0.032)	0.264*** (0.032)	0.280*** (0.036)
Registration: Dementia	0.020 (0.025)	0.021 (0.025)	0.022 (0.026)
Registration: Learning disability	−0.032 (0.023)	−0.032 (0.024)	−0.034 (0.025)
Registration: Mental health	−0.032 (0.024)	−0.032 (0.024)	−0.034 (0.026)
Registration: Adults 18–64	0.042* (0.024)	0.042* (0.024)	0.043* (0.025)
Registration: Children	0.038 (0.029)	0.036 (0.029)	0.040 (0.031)
Observations	24,668	24,668	24,668
Number of home care providers	11,178	11,178	11,178
Weak instruments (Competition)	725.15***	812.30***	812.30***
Weak instruments (Quality)	545.74***	545.74***	545.74***
Over identification (Competition)	0.75^{NS}	1.50^{NS}	0.65^{NS}
Over identification (Quality)	4.47**	0.12^{NS}	4.36**
Endogeneity (Competition)	4.32**	−2.09**	−2.07**
Endogeneity (Quality)	−11.66***	−11.62***	−8.89***
Specification		−0.78^{NS}	−1.42^{NS}
LR test of random effects			1.97*

Table 3 Results of closure model.

Notes: Robust standard errors in parentheses, controls for region and year included. Omitted variables: Size of organisation, 1 and Registration: Older people. ^{NS} indicates not significant and *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

DISCUSSION

With a growing elderly population and policy aimed at supporting people's care needs at home and in the community, the market for home care in England has been rapidly growing and has a large monetary value. However, as yet, little is known about the supply dynamics of home care, with most research being at the descriptive level. This work has quantitatively examined the reasons for home care agency closure using data on all home care agencies from 2014–2018.

Both quality and competition significantly influenced the likelihood of closure, with (high) quality decreasing, and competition increasing, closure probability, confirming the hypotheses. The size of effect of competition can be fairly large, with a new provider locating next to an existing provider increasing the probability of closure by a quarter. There was also indication that providers are less likely to close in areas with high levels of need and in areas with higher levels of care home supply. This latter finding, given the analysis has controlled for needs, could be an indication that providers are locating in markets where successful alternative providers of care already exist (e.g. Toivanen & Waterson, 2005).

We found limited evidence on costs affecting the likelihood of closure. For example, we found no indication that rurality increases the chance of home care agency

VARIABLES	(1)	(2)	(3)	(4)
	ACTUAL QUALITY RATING INCLUDED	QUALITY RATING EXCLUDED	MEDIAN LA WAGE INCLUDED	REGISTRATION AGE INCLUDED
Home care supply				
Providers, 10 mins (log)	0.232* (0.136)	0.155** (0.077)	0.196** (0.087)	0.199** (0.086)
Home care quality				
Quality rating ('Good'/'Outstanding')	−0.458*** (0.037)			
Predicted quality (log)			−0.173*** (0.037)	−0.182*** (0.037)
Demand				
Total population (log)	−0.092 (0.077)	−0.047 (0.042)	−0.045 (0.048)	−0.049 (0.048)
Population 85+ rate	0.002 (0.013)	0.001 (0.007)	0.008 (0.008)	0.008 (0.008)
Income deprivation score	0.013 (0.014)	0.007 (0.007)	0.008 (0.009)	0.010 (0.009)
Pension credit 60+ rate	−0.001 (0.002)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Health deprivation score	−0.009 (0.013)	−0.004 (0.007)	−0.005 (0.008)	−0.007 (0.008)
Attendance allowance 65+ rate	−0.009** (0.004)	−0.007*** (0.002)	−0.007*** (0.003)	−0.007** (0.003)
Hip fractures (log)	−0.034 (0.034)	−0.036** (0.018)	−0.039* (0.021)	−0.037* (0.021)
LA non-residential care expenditure (log)	0.010 (0.029)	0.017 (0.016)	0.017 (0.018)	0.017 (0.018)
Supply				
Care home beds, 10 mins (log)	−0.183* (0.110)	−0.125** (0.062)	−0.169** (0.070)	-0.171** (0.070)
Female JSA rate	0.019 (0.021)	0.018* (0.010)	0.018 (0.013)	0.019 (0.013)
Average house price (log)	0.015 (0.060)	0.003 (0.033)	−0.019 (0.040)	0.004 (0.038)
Rural location	0.058 (0.079)	0.043 (0.044)	0.047 (0.050)	0.043 (0.050)
Female median hourly wage, £			0.014 (0.010)	
Size of organisation, 2–9	0.425*** (0.040)	0.363*** (0.021)	0.397*** (0.025)	0.398*** (0.025)
Size of organisation, 10–19	0.530*** (0.066)	0.388*** (0.035)	0.438*** (0.042)	0.440*** (0.042)
Size of organisation, 20+	0.327*** (0.050)	0.284*** (0.028)	0.262*** (0.032)	0.257*** (0.032)
Registration: Dementia	−0.043 (0.039)	0.023 (0.021)	0.021 (0.025)	0.020 (0.025)
Registration: Learning disability	−0.039 (0.038)	−0.043** (0.020)	−0.032 (0.024)	−0.026 (0.024)
Registration: Mental health	−0.025 (0.039)	0.0001 (0.021)	−0.032 (0.024)	−0.031 (0.024)

(Contd.)

VARIABLES	(1)	(2)	(3)	(4)
	ACTUAL QUALITY RATING INCLUDED	QUALITY RATING EXCLUDED	MEDIAN LA WAGE INCLUDED	REGISTRATION AGE INCLUDED
Registration: Adults 18–64	0.067* (0.039)	0.055*** (0.020)	0.041* (0.024)	0.024 (0.024)
Registration: Children	0.091** (0.045)	0.074*** (0.025)	0.037 (0.029)	0.043 (0.029)
Age (of registration)				0.097*** (0.018)
Age (of registration) squared				–0.020*** (0.003)
Observations	11,159	32,760	24,668	24,668
Number of home care providers	6,830	12,443	11,178	11,178

Table 4 Additional results of closure model.

Notes: Robust standard errors in parentheses, controls for region and year included. Omitted variables: Size of organisation, 1 and Registration: Older people. *** p < 0.01, ** p < 0.05, * p < 0.1.

COMPETITION TIME RADIUS (MODEL)	MARGINAL EFFECT	95% CONFIDENCE INTERVAL
10 mins (IV)	0.044** (0.019)	0.008–0.081
10 mins (PA)	0.045** (0.019)	0.008–0.083
10 mins (RE)	0.047** (0.020)	0.008–0.085
Robustness checks		
With quality rating, 10 mins (PA)	0.040* (0.023)	–0.006–0.086
With no quality, 10 mins (PA)	0.035** (0.17)	0.001–0.068
With Median female wage, 10 mins (PA)	0.043** (0.019)	0.006–0.080
With registration age, 10 mins (PA)	0.047** (0.021)	0.007–0.088
Varying competition time radius		
2.5 mins (PA)	0.018 (0.034)	–0.049–0.086
5 mins (PA)	0.048* (0.027)	–0.006–0.101
7.5 mins (PA)	0.046** (0.021)	0.005–0.087
15 mins (PA)	0.062 (0.046)	–0.029–0.153
20 mins (PA)	0.089 (0.062)	–0.032–0.210
With competition radius in km (not time-weighted)		
10 km (PA)	0.035** (0.017)	0.002–0.070

Table 5 Marginal effects of home care competition on closure.

Notes: Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

closure. Other things equal, providing home care in a rural setting will be more expensive than in an urban setting and there is evidence of fewer agencies in rural areas (Allan, 2021; Wang, Leifheit-Limson et al., 2017). Therefore, this finding could provide evidence of adequate levels of funding from LAs to support rural home care supply, greater use of provider market power in setting prices for those self-funding or a persistent effect of investment influencing future decisions. The analysis did find that agencies registered to provide care for adults aged 18–64 were more likely to close than those registered to provide care for older people, which could be linked to service delivery costs.

In terms of competition in home care, this work provides evidence that in England there are high levels of agency turnover and that competition increases likelihood of agency closure. It was also found that agencies that are part of larger organisations were more likely to close. This could indicate either that there are difficulties in expansion within this market or that larger organisations are consolidating their provision of services from fewer locations. More research is required in this area.

Whilst the process of creative destruction can be considered an indication of a successful market, the extent to which this applies in long-term care is open to question. This is particularly so given continuity of care is an important factor in care quality (Brown Wilson & Davies, 2009; Brown Wilson et al., 2009). Further, providers in competition with one another for demand of their services are also likely to be in competition with one another for staff; the majority of recruitment of staff comes from within long-term care (Skills for Care, 2020; Allan & Darton, 2022). Higher competition for staff could ultimately lead to reductions in care quality (Allan & Vadean, 2021; Castle, 2021). Overall, home care markets need to be carefully managed if they are to provide

choice to the consumer, continuity of care and create a market with continuous improvement without driving providers out of the market (Needham et al., 2022). The effect on local home care markets of the COVID-19 pandemic is likely to have focused this need even more acutely, but future research would be required to assess to what extent.

This analysis has confirmed that the CQC quality rating system successfully works in providing quality information to consumers in the market. Closure occurs for those home care providers that have poorer quality, because of consumer choice and/or through the CQC regulatory process. This supports previous research for care homes in England (Allan & Forder, 2015). Importantly, closure of a home care provider is likely to mean a change in circumstance for those that were supported by the firm and this could have welfare implications. Given a poor-quality provider has closed, moving to a new provider should be welfare improving overall (Allan & Forder, 2015). However, this assumes that the market works efficiently and changes in service can be made easily. It is certainly feasible in the English home care market that there could be a consistency in provision by staff even as an agency closes, e.g. staff moving to a different agency or becoming a personal assistant. Also, whilst there is evidence on the impact on outcomes of care home closures (e.g. Holder & Jolley, 2012), the extent of outcomes being disrupted by changes in home care provision is unknown. Overall, further research is required on the welfare implications of home care agency closure.

There were a number of limitations to the analysis. Potential errors in the identification of closures were previously outlined. There was no information on where agencies provided services nor whether a registered site was dormant, i.e. not providing services. Other changes in provider structure, e.g. a change of ownership, were not examined and could have effects on the outcomes of those receiving care. Future research should address these issues. The measure of supply used in the analyses, the count of home care providers, gives no indication as to the size of the providers. For example, competition levels may vary in two markets with the same number of providers. However, given the measure assumed that all the markets are at their most competitive state, the effect of competition found in the analysis is likely to have been underestimated. Finally, the analysis was missing important information that will influence the market, e.g. on price, costs, staffing and LA market shaping and commissioning decisions. To address this, relevant control variables were included, where possible. Further research on home care market dynamics is required with disaggregated data on price, costs and staffing and with greater information about local and national long-term care policies.

CONCLUSION

This study has provided the first evidence on market dynamics of the English home care market, finding that competitive effects and (low) quality are important drivers of provider closure. These findings have important implications for long-term care policy given the increasing importance of home care in the delivery of care internationally and can help to ensure access to high quality for all.

APPENDIX

DATA	SOURCE	LINK
Home care provision, type, size, quality and care home beds	Care Quality Commission (CQC)	https://www.cqc.org.uk/about-us/transparency/using-cqc-data
Local population and geography indicators	Office for National Statistics	https://www.nomisweb.co.uk/
Needs and income benefits	Department for Work and Pensions	https://www.nomisweb.co.uk/
Deprivation domains	Ministry of Housing, Communities & Local Government	https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015
Hip fractures	Office for Health Improvement and Disparities	https://lginform.local.gov.uk/reports/lgastandard?mod-metric=12198&mod-area=E06000031&mod-group=AllLaInCountry&mod-type=comparisonGroupType
House prices	HM Land Registry	https://www.gov.uk/government/collections/price-paid-data
Travel speed	Department for Transport	https://www.gov.uk/government/statistics/road-congestion-and-reliability-statistics-table-index

Table A1 Data sources.

DATA ACCESSIBILITY STATEMENTS

The data used in this analysis are available in the public domain and are listed in the appendix Table A1.

NOTES

1 A caveat on comparing the data is that home care closure and opening rates are by agency (i.e. separate registered geographic sites) whereas opening and closure rates for England are for businesses as a whole that could, for example, own a number of home care agencies that are registered to provide care. However, only a small number of businesses in total operate in more than one site in UK – 2.2 per cent in 2020 (ONS, 2020a).

2 Alternative measures of home care supply utilised in the literature include the number of people publicly supported in home care (e.g. Fernandez & Forder, 2008) and measures of the workforce (e.g. Liu et al., 2021). There is a strong positive correlation between number of agencies and both non-residential adult social care expenditure and direct care workforce at LA-level (Allan, 2021).

3 This assumed that all providers are of equal size, and therefore the Herfindahl-Hirschman Index (HHI) for a local market would be: $HHI = 1/n$. This maximises the estimated level of competition in each market.

4 Specifically, average speed data for local 'A' roads in 2015–2018 at the LA-level was used (Department for Transport, 2024), which was converted to time and then used to create predicted travel time per km for each MSOA. Predicted travel time per km was generated from a GLM regression with log link and gamma distribution of travel time on population density, its square, average house price, its square and then variables to control for region and year (see Forder & Allan, 2014). There was no data for 2014 and therefore predicted 2015 travel time per km was used for 2014.

5 Changes in rating occur over time between the binary measure of quality, e.g. 56% (22%) of providers originally rated as 'Requires improvement' ('Good') were rated as 'Good' ('Requires improvement') upon a second rating (Care Quality Commission, 2017).

6 Strictly, as is generally the case in the closure literature, the t+1 status of provider was observed, and it is assumed that $c^*_{jt+1} = c^*_{jt+1}(x_{jt})$. This method of modelling may naturally help mitigate endogeneity issues from omitted variables if they are time invariant.

7 This is calculated as $\frac{\Delta \Pr(c_j)}{\overline{n_{10}}} = \frac{ME^*(1/(\overline{n_{10}}*0.01))}{\sqrt{d}}$, where ME = marginal effect, $\overline{n_{10}}$ is the average number of providers in a 10 minute radius of MSOA j and d is distance in time to the new provider from the MSOA, with $d = 1$ for any time less than 1 minute.

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COMPETING INTERESTS

The author has no competing interests to declare.

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