How Deadly Is Financial Leverage?
Evidence from Care Homes during the COVID-19 crisis

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Highly levered care homes have a death rate twice as high as unlevered care homes at the peak of the COVID-19 pandemic. Care homes controlled by private equity firms no longer display significantly higher death rates once controlling for leverage. Leverage matters only once accurately constructed: i) the full ownership structure of each care home needs to be identified; ii) operating leases must be capitalized and added to the balance sheet. These two issues have seldom been tackled in the literature and we show that they matter.

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Measuring the cost of financial distress is an important topic in financial Economics, but it is difficult due to the challenge of i) distinguishing between financial and economic distress;[1] and ii) measuring non-financial impact on stakeholders. In this paper, we study how ex-ante financial leverage levels impact care home death rates during the COVID-19 pandemic.

We focus on English care homes because our analysis requires i) detailed and consolidated accounting statements for each company operating in this industry, including private companies and this data is not available in the US (see Michaely and Roberts (2012), Bernstein, Lerner, and Mezzanotti (2019)), and ii) data on death rates per care home per week. Importantly, we note that England has the same overall COVID-19 death rate as the US (at about 0.1%) and a similar fraction of deaths occurring in care homes (one third).

Care homes during the COVID-19 pandemic offer an ideal setting to study the cost of financial leverage given i) their product homogeneity, ii) their being hit by an unprecedented shock that indiscriminately hit all of them, and iii) the wide dispersion of capital structures. In addition, care homes have a single principal stakeholder: residents. The impact on the main stakeholder can then be measured by a simple metric: resident death rates.

As pointed out in Jensen and Meckling (1976), in bad times, leveraged operators have incentives to engage in activities such as cost cutting (e.g., personnel protective equipment, staff replacement).[2] By doing so, operators may indirectly increase death rates among their residents. These theories predict that the effect should be non-linear both cross-sectionally and in the time-series. That is, we expect leverage to matter most for care homes that are highly levered, and at the peak of the crisis. In other words, there should be less difference, if at all, in death rates among low-leverage care homes than among high-leverage care homes. Similarly, the relationship between leverage and death rates should be stronger during the first wave not only because death rates in that wave are generally higher, but also because the government started to support all care homes financially right after the first wave.

In England, the regulator publishes the name of the provider of each care home along with its company registration number, allowing anyone to access the provider's financial information. Using this information, we can compute the leverage faced by each home at the level of

[1] E.g. Asquith, Gertner, and Scharfstein (1994), Gilson (1997) and Hotchkiss (1995) find evidence that financial distress is costly, but firms in all these samples have negative operating income, and, therefore, are also facing economic distress. See Andrade and Kaplan (1998) for a setting where the two can be distinguished.

[2] The worldwide demand shock for PPE led to increases in prices for some equipment of over 1,000%, and some care homes reported increasing expenditures on PPE by over 4,700% compared to normal times (Flynn (2020)).

its provider; and we use the definition of leverage that is found in most of the literature: the ratio of the book value of debt over the book value of total assets. We find that this 'simple provider leverage' is unrelated to death rates in any of the waves. That is, if we use the most common measure of leverage and the data as provided by the regulator, the conclusion would be that financial leverage does not matter for death rates.

In contrast, ownership appears to matter for death rates. Care homes controlled by Private Equity (PE) firms have significantly higher death rates in the first wave. While the average death rate in care homes during the first wave is 3.5%, PE-controlled care homes have a death rate that is more than 50% higher at 5.5%. In regression analysis, some of the spread is absorbed by care home characteristics (PE-controlled care homes tend to be larger and cater to more fragile residents), but the PE effect remains significant after these controls.

We then move away from the simple and naïve measure of leverage. First, we note that many providers are part of a larger group. In this case, the leverage of a provider is not a meaningful proxy for the financial pressure faced by a given care home. When a provider belongs to a larger entity, it may be more pertinent to measure leverage at the level of that larger entity.[3]

Identifying these larger entities is not trivial. The regulator attempts to indicate when providers are related to each other but does not purport to provide an accurate description of corporate group ownership structures. Nonetheless, we can aggregate financial accounts at what the regulator calls the 'brand' level. We find that results are unchanged: *simple brand leverage* is unrelated to death rates. In other words, if we use publicly available information on either brand or provider to assess leverage, leverage is unrelated to death rates.

As just mentioned, however, the regulator does not formally identify the larger entities each provider belongs to. To identify larger entities for the purpose of financial analysis, we need to trace the ownership of each provider back to who ultimately controls the provider.

Where we find that a corporate parent owns one or more providers, and the parent files consolidated accounts that include the full group, we attribute the leverage in the consolidated accounts to each care home belonging to that group.[4] Where we find that one or more providers

[3] We are implicitly assuming a liquid and frictionless internal capital market.

[4] To identify groups, we need to establish the corporate ownership structure within which each provider sits. This is a non-trivial exercise that requires professional experience in analyzing corporate structures. In addition, it is necessary to examine the financial accounts of each group in detail (i.e., checking footnotes and inconsistencies in accounting presentation). This process uncovered some errors in the way the data provider (FAME) reports the data. For care homes that do not belong to a consolidated group we use the leverage reported by their provider.

are under common control but not part of a group with consolidated financial accounts, we calculate leverage by aggregating the accounts of the providers under common control. We find that *simple group leverage* measured this way is weakly related to death rates in the first wave.

Second, we note that the *simple* definition of leverage (book value of debt over assets), although standard in the literature ignores the existence of operating leases. Operating leases can be large and are akin to debt obligations; they are sometimes referred to as off balance sheet debt.[5] Although several studies suggest that leasing is a critical element of the capital structure (e.g., Ang and Peterson (1984), Graham, Lemmon, and Schallheim (1998), Eisfeldt and Rampini (2009)), most of the literature studying the determinants of capital structures and financial distress has ignored operating leases. For example, Cohn, Hotchkiss, and Towery (2020) state that 'we do not observe operating leases, which are not included in debt. However, some have argued that operating leases should be treated as debt for the purpose of calculating leverage ratios.' Rauh and Sufi (2012), and Serfling (2016) are rare exceptions.

We find that among the groups managing more than one thousand care home beds, 69% report some lease rental expenses and their mean ratio of lease rental expenses to total assets is 16%. Lease rental expenses are smaller for smaller groups. Across the whole sample, the overall value of their operating lease rental expenses is only 1.4% of those groups' total assets.

To capitalize the operating lease payments, we use data from two REITs that are trading in England and specialize in the rental of care homes.[6] Each of them reports a ratio of value to rent of 13. We thus multiply reported lease rental expense by 13 and add this amount to both the numerator (Debt) and the denominator (Total Assets) of the leverage ratio.

Although operating leases are small across the full sample, adjusting for them in this way significantly changes the capital structures of some of the provider groups. So much so that once operating leases are adjusted for, *group leverage* is strongly related to death rates in the first wave. Both the statistical and economic magnitudes are large.

[5] Care home operators have the option of either owning the care homes they operate or renting them. To the extent that they rent any care homes from third party landlords under an operating lease, this arrangement removes both assets and liabilities from the operator's balance sheet. The smaller resulting asset base makes it harder to secure financing in times of crisis. Note that account standards distinguish between 'operating leases' and 'capital or finance leases'. Future obligations under an operating lease do not appear on the balance sheet, hence the term 'off balance sheet debt. In contrast, a finance or capital lease is treated broadly like other 'on balance sheet' debt. All discussion of leases in this paper relates only to operating leases.

[6] Note that for the six groups that have recently adopted new accounting rules for operating leases (in the UK, IFRS 16; for three US-based groups, ASU 2016-02), we first reverse the effect of the new accounting standards and then apply the same adjustment as for the remainder of the sample. See Appendix 2.

In addition, the leverage effect is robust to several important changes: i) the multiple used to capitalize rent; ii) not correcting FAME data; iii) the treatment of shareholder loans, cash and intangible assets; iv) conducting the analysis on sub-samples or on wider samples; v) changing the end dates of the waves of mortality; vi) treating members of non-consolidated groups as consolidated groups or standalone providers; and vii) including all deaths in care homes (not just COVID-19 ones).

Not only do the adjustment for operating leases and the reconstruction of corporate ownership trees make leverage significant to explain death rates; they also make ownership irrelevant. That is, once we use a more accurate measure of leverage, care homes that are PE-controlled no longer have higher death rates. This result means that being PE-controlled per se does not affect death rates, but that having high leverage does. Also, with all control variables in place, it is the care homes run by not-for profit organizations and those we identify as family firms that have higher death rates during the first wave.

We also find that leverage has no impact on death rates after the first wave. We note that the pandemic was weaker immediately after the first wave, but also, very importantly, the government intervened financially to help care homes. In addition, leverage does not matter within small care homes, where the virus was less likely to circulate and create casualties. Finally, leverage does not matter when it is below 50%. That is, it makes no difference to the death rate if leverage is 10% versus 40%, but it makes a significant difference if it is 60% versus 90%. These results are all consistent with the Jensen and Meckling (1976) view. Leverage has a material impact only when the company is hit by an extreme shock.

As with most studies in this literature, we lack exogenous variation in leverage to isolate its causal effect. The most plausible non-causal hypothesis is that leverage proxies for an unobservable characteristic of care home operators. For example, companies that use high leverage may simply be those that are more focused on profit than on resident welfare.[7]

Our setting, however, enables us to significantly narrow down the set of possible unobserved characteristics. The unobservable characteristic in this case would have to manifest itself only during the peak of a crisis, in addition to having a non-linear effect. Thus, the unobservable variable cannot simply be a general lack of care but would have to be something like not caring any more when hard times hit.

[7] Note that we find no link between leverage and the CQC's ratings of quality of care.

A key contribution of this paper concerns the way leverage is measured. The literature has mostly ignored operating leases when measuring leverage. Consistent with Rauh and Sufi (2012), we show that this omission can have a significant impact on economic analysis. Moreover, we highlight that the recent changes in accounting rules to bring operating leases 'on balance sheet' makes the measure of leverage actually noisier. Companies with short-term operating leases will, ceteris paribus, show lower leverage than companies with longer-term operating leases because the recent changes broadly require simply computing the present value of future rents due.

Our research question is also important per se and our results offer some policy implications. Care homes were a flashpoint in the COVID-19 pandemic, with more than a third of the US's 184,000 deaths occurring in such facilities, and higher proportions reported in such countries as Canada and France.[8] To prevent and mitigate future health crises, arguably an important objective, it is imperative to understand which care home is associated with a higher death rate when hit by a pandemic.

A review of the related literature is provided in the next section. Section 3 describes the data and the construction of leverage ratios. Section 4 presents descriptive statistics. Section 5 contains shows results from regression analysis, including robustness tests. Section 6 concludes.

2. Related Literature

Several contemporaneous papers study whether there is a relation between care home ownership (mostly, PE versus non-PE) and COVID-19 cases and deaths. The key distinctive feature of our paper is that it uses English data whereas the other papers use the same US dataset.

Regulatory disclosure in this sector in the US is almost the mirror image of what is available in the UK. In the US, many individual healthcare facilities need to submit relatively detailed operating financial data at the individual facility level to healthcare regulators. But if the company that owns a facility is privately owned and has not issued publicly traded debt, then financial regulations do not require the parent company to publish accounts. Where PE-controlled care homes are concerned, consolidated leverage at the level of a Topco is unobservable.

In the UK, by contrast, financial regulation requires even privately owned organizations to file annual accounts. This makes it possible to observe the most relevant leverage ratios. But UK healthcare regulators make much less information available at the facility level: at the care

[8] https://www.nytimes.com/interactive/2020/us/coronavirus-nursing-homes.html

home level we have access to only basic non-financial information such as the mortality rate, number of beds and quality ratings.

To sum up, the US regulatory framework makes it possible to see a high level of detail in healthcare without the bigger financial picture; while the UK framework provides the bigger financial picture, without the granular operating details. As a result, although our accounting information is not perfect, we believe English data is better suited to study any link between the consequences of the pandemic and financial variables.

Papers that use US data include the following. Gandhi, Song, and Upadrashta (2020) find that 391 PE-owned care homes have a lower probability of COVID-19 cases and PPE shortages; but it is the opposite result for the 1,219 care homes previously owned by PE firms. Abrams et al. (2020) find a positive correlation between Covid-19 occurrence and i) larger facilities, ii) urban location, iii) greater percentage of African American residents, and iv) nonchain status; and find no correlation with i) five-star quality ratings, ii) prior infection violations, and iii) Medicaid dependency. They also find no correlation with ownership (for-profit, not-for-profit, government). Gorges and Konetzka (2020) find that higher registered nurse-hours and lower per capita cases in the county are both associated with a lower probability of experiencing an outbreak and with fewer deaths. Chen, Chevalier, and Long (2020) show the importance of staff linkages across care homes for predicting COVID-19 outbreaks. Begley and Weagley (2021) find that care homes with lower pre-pandemic cash-on-hand, and care homes that experienced a more adverse cash flow shock during the pandemic are more likely to have cases of COVID-19.

Two important papers studying the economics of care homes in the US are also closely related to our work. Gupta et al. (2020) estimate that private equity ownership increases short-term mortality by 10%, which implies about 21,000 lives lost due to private equity ownership over their sample period. They observe several channels that help explain the increase in mortality: declines in patient-level health measures, such as worsening mobility and elevated use of anti-psychotic medications; declines in nurse availability per patient; and declines in compliance with standards of care. They also find that private equity ownership increases spending by 19%, the majority of which is billed to taxpayers.

Gandhi, Song, and Upadrashta (2020) find that in response to the introduction of the Five-Star Quality Rating System and its emphasis on registered nurses, PE-owned facilities increased

this type of staff more than their non-PE counterparts, but only in places where they face high competition.

More broadly, there is a vast literature on the consequences of leverage for capital investments and future growth: Myers (1977); Whited (1992); Hotchkiss (1995); Lang, Ofek, and Stulz (1996), Almeida, Campello, and Weisbach (2004). In particular, the issue of risk-shifting by companies that are becoming financially distressed has been highly scrutinized. Parrino and Weisbach (1999) argue that risk-shifting should not be a major concern. Both survey evidence and experimental evidence confirm that risk-shifting is not first-order for managers (Graham and Harvey (2001); Hernández-Lagos, Povel, and Sertsios (2014)). Empirical evidence is mixed, with settings in which risk-taking does not occur (e.g., Rauh (2009); Gilje (2016)) and with settings in which it does (e.g. Landier, Thesmard, and Sraer (2011)).

A similar literature studies the consequences of financial frictions on stakeholders, usually focusing on industries in which consumers incur switching costs, as is the case for care homes. There, empirical evidence is consistent and overwhelming. Firms that are more leveraged i) treat their employees less fairly (Bae, Kang, and Wang (2011)), ii) have more inventory shortfalls (Matsa (2011), iii) degrade their products' quality and increase prices (Chevalier (1995); Phillips and Sertsios (2011); Matsa (2011)), iv) produce products that are less safe (Kini, Shenoy, and Subramaniam (2017)), v) generate more environmental spills (Cohn and Deryugina (2018)), vi) witness more injuries at work among employees (Cohn and Wardlaw (2016)), vii) display more housing code violations (Seltzer (2020)) *etc*.

Of special interest here is the recent evidence from the healthcare sector provided by Adelino, Lewellen, and Mccartney (2020). They find that the 2008 crisis was followed by an unprecedented drop in hospitals' capital investments. Yet there are no overall effects on patient outcomes. They argue that the non-profit organizational form, combined with the hospitals' internal governance structures, shields patients from undesirable shifts in quality in response to financial shocks.

There is also a growing literature on the consequences of private equity control on company stakeholders. This research agenda is important given the growth of private equity. Under private equity control, companies are likely to see improvements in profitability (Guo, Hotchkiss, and Song (2011); Cohn, Nestoriak, and Wardlaw (2016)), total factor productivity (Davis et al. (2014)), growth (Bernstein et al. (2017); Boucly, Sraer, and Thesmar (2011); Cohn, Nestoriak,

and Wardlaw (2016)), access to external finance (Boucly, Sraer, and Thesmar (2011)), and patent activities (Lerner, Sorensen, and Strömberg (2011)).

Evidence is mixed when looking at the impact on other stakeholders. In some sectors, private equity breaches implicit contracts with stakeholders (Eaton, Howell, and Yannelis (2020)). In terms of environmental impact, Shive and Forster (2020) and Bellon (2020) find that PE-owned companies pollute more. Consumers, however, enjoy an increase in product variety in PE-owned supermarkets (Fracassi, Previtero, and Sheen (2019)) and better food-safety in PE-owned restaurants (Bernstein and Sheen (2016)). For employees, there is an increase in training, employability and workplace safety (Agrawal and Tambe (2016); Cohn, Nestoriak, and Wardlaw (2016)), more efficient reallocation of the workforce (Davis et al. (2014)), less of a gender wage gap (Fang, Goldman, and Roulet (2021)). Employment slightly increases in the US (Davis et al. (2021)) and decreases in Germany (Antoni, Maug, and Obernberger (2019)). Garcia Gomez, Maug, and Obernberger (2021) find more job losses for employees in poorer health, which exacerbates pre-existing health issues. Olsson and Tåg (2017) find no change in overall employment, but unemployment increases for workers performing tasks that are routine or can be moved offshore.

On the accounting front, we contribute to the debate on whether operating leases and debt are substitute or complements (Ang and Peterson (1984); Yan (2006); Devos and Rahman (2014); Chowdhury, Rahman, and Sankaran (2021)), and on the importance of adjusting for leases when measuring leverage (Graham, Lemmon, and Schallheim (1998); Eisfeldt and Rampini (2009); Rauh and Sufi (2012)).

3. Data

3.1 Company accounts in England

As already pointed out by Brav (2009), Michaely and Roberts (2012), and Bernstein, Lerner, and Mezzanotti (2019), England is a perfect setting for studies on private companies because every registered company is required to provide financial accounting data annually to a public register. Private company reporting is subject to equivalent regulatory provisions as public company reporting. The U.K. Companies Act and related legislation requires all private and public companies to file annual financial statements that comply with the same accounting standards and they are subject to the same tax laws.

Yet, as pointed out by Ball and Shivakumar (2005), the quality of financial reporting is generally lower for private companies, especially for smaller ones. Previous studies have focused on for-profit companies and have excluded small companies. Our focus on the care home sector means that we also need to study entities that are not run for profit and smaller companies. Consequently, we need to gather financial accounts from different sources. Figure 1 provides a visual summary.

First, Companies House publishes the accounts for, and regulates, two for-profit legal forms (companies limited by shares and limited liability partnerships) and one non-profit legal form (companies limited by guarantee).[9]

Second, the Charity Commission regulates and publishes the accounts for charities.[10] Charities are organizations that operate for the public good and in return receive certain tax benefits. Charities use one of four legal forms: charitable incorporated organization, royal charter company, unincorporated trusts and associations, and company limited by guarantee. Regardless of the legal form they use, we refer to all entities regulated by the Charity Commission as charities. Note that when a company limited by guarantee chooses to register with the Charity Commission it becomes subject to two regulators; we classify it as a charity.

Third, the Financial Conduct Authority (FCA) regulates a range of other non-profit legal forms, of which the one relevant for this study is the 'registered society.'[11]

< Figure 1 here >

3.2 Sample selection

We obtain data about care homes in England from the Care Quality Commission (CQC). The CQC is an English independent regulator of health and adult social care, which includes care homes. It is sponsored by and accountable to the UK Secretary of State for Health. For each care home that it regulates, the CQC provides data that include geography, size, service type, the Companies House and Charity number (if applicable). We select the care homes that have 'older people' as one of their service user bands. We refer to these as care homes.

[9] https://www.gov.uk/government/organisations/companies-house
[10] https://www.gov.uk/government/organisations/charity-commission
[11] https://www.fac.org.uk/. The Financial Conduct Authority (FCA) regulates about 9,700 registered societies. Accounts are published at the Mutuals Public Register: https://mutuals.fca.org.uk/. A small number of companies limited by guarantee, which are therefore non-profit and report to Companies House, do not register with the Charity Commission. We pool these with Registered Societies because both types of company are non-profit but not registered with the Charity Commission.

We exclude care homes with less than 10 beds (N=202), with no location identifier (N=4) and those with no data on weekly mortality (N=817). This remaining sample contains 8,760 care homes managing 374,032 beds. We refer to this as the extended sample and show the relevant statistics in Table 1 – Panel A.

For each of these 8,760 care homes, the CQC identifies the 'provider'. Each of the 5,136 providers self-reports to the CQC that it belongs to one of three categories: individual, partnership or organization. We exclude from the sample providers that self-identify as individuals and partnerships (N=735) and organizations that are local government bodies (N=48). Neither of these two types of provider involves incorporated entities and thus they do not produce financial accounts. The remaining 4,353 providers are incorporated entities. We refer to this subset as the total incorporated providers (see Table 1 – Panel A).

CQC provides a registration number for each of these 4,353 providers that allows us to find the filings that the provider makes with its primary regulator. The majority of the sample (N=3,972) are registered at Companies House; the balance at the Financial Conduct Authority (FCA) (N=265) and the Charity Commission (N=116). Our main way of obtaining these filings is the Financial Analysis Made Easy (FAME) database, which is compiled by Bureau van Dijk. FAME contains data from filings from all companies which are registered at Companies House. Its database also includes some of the companies regulated by the FCA, but does not include data on the subset of charities that are regulated only by the Charity Commission. For organisations regulated by the FCA or only by the Charity Commission, we rely on manual searches of the relevant regulator's website. Our final "working sample" consists of 4,223 providers which operate 98.6% of all beds operated by incorporated providers (see Table 1 – Panel A).[12]

3.3 Identifying provider groups, financial ratios and ownership types

Because we aim to assess a care home's financial strength, the most relevant unit of study is the largest corporate group to which the care home belongs. This is not necessarily the care home's provider, because the provider may be a subsidiary of a larger company. Group structure is also important because it provides the basis on which we assign ownership types. Where ownership of a corporate group is concerned, what matters is who controls the parent company.

[12] The gap consists of 61 for-profit providers where we were unable to find a match in FAME data (eg because the provider was a new company that had not filed any accounts before our cut-off date of 31 March 2020); and 69 non-profit providers each operating less than 50 beds per care home.

Our starting point for identifying provider groups is the working sample of 4,223 incorporated entities. The conventional definition of a 'corporate group' is a group of companies that share a single corporate parent ('Topco'). The parent's accounts consolidate the accounts of all the companies the parent owns: this is the model that applies to most listed companies. However, our sample contains very few listed companies. Most providers are closely held by families or small groups of individuals. Non-institutional owners like this face less pressure from stakeholders such as equity investors or lenders to present a consolidated financial picture. This means that even if there is common ownership and control, the owners are less likely to organise the companies they control under a single parent company that files consolidated accounts.

Due to this feature of our sample, we assign each provider to one of three group types. (i) A 'standalone' provider: one that is not part of any kind of larger group. (ii) A 'consolidated group': matches the conventional definition of a corporate group described above. (iii) A 'non-consolidated group': a group of companies that are under common control but do not share a single corporate parent that files consolidated accounts. See Figure 2 for a diagrammatic illustration of these three group types.

< Figure 2 here >

We identify and map provider groups by triangulating three sources of data. (i) The CQC allocates 862 providers to 202 'brands'. Although the CQC's 'brand' concept does not purport to address group ownership structures, or to identify any relevant parent companies, a 'brand' association indicates an ownership link of some kind between a group of providers. (ii) For the 4,063 providers covered by FAME, we can use the entries for "Global Ultimate Owner" and directors' names. (iii) For all providers, we can inspect the notes to the accounts which usually indicate group and ownership status. Appendix 1 provides details on this process.

Table 1 – Panel B shows that the 4,223 providers in our working sample belong to 2,687 groups. Just under one-half of the providers are not linked to a larger group and are therefore classified as standalone (N=1,936). These standalone providers manage one-third of the care homes and about one-quarter of the beds. Just under one-third of both homes and beds are operated by 478 non-consolidated groups. Only 273 of the groups have consolidated accounts, but together these consolidated groups operate about one-third of the homes in our working sample and 44% of the beds. This group profile of the working sample of providers makes it possible to complete the final stages our analysis requires by both (i) calculating financial ratios and (ii) assigning ownership types for each group.

Financial ratios. For standalone providers, we calculate financial ratios based on the provider's own accounts. For consolidated groups, we use the consolidated accounts of the parent company. For non-consolidated groups, we aggregate the accounts of the providers that belong to the group. Finally, to ensure that the accounts we use are unaffected by the pandemic, we apply a cut-off date of 31 March 2020 for financial information. That is, we use the accounts filed closest to, but no later than, 31 March 2020. Table 1 Panel C shows that we obtain accounting data for 2,559 groups, accounting for 92% of beds, from FAME; the remainder of the working sample requires manual searches. Table 1 Panel D shows that the financial data for 725 groups, representing 71% of all beds, include profit and loss data. The remaining 1,962 groups (29% of beds) involve companies small enough to qualify for an exemption that allows them to file only balance sheet data and no profit and loss statement. See Appendix 2 for further details.

Ownership types. We introduce five categories of ownership. First, we identify PE-held groups using Capital IQ, published reports of PE firm involvement in the sector and relevant filings.[13] Second, if all directors share the same surname, we identify that provider as a family firm. Third, we label the remaining for-profit providers 'other for profit'.[14] Fourth, we label any provider that is registered with the Charity Commission as a 'charity'. The fifth group, consisting almost entirely of registered societies under the FCA – is labelled 'RS & CLG'.[15] We assign one of these five ownership types to each provider group on the following basis. For consolidated groups it reflects the ownership type of the parent company ('Topco'). As non-consolidated groups consist almost exclusively of for-profit providers, we follow the pattern described above: PE, family firm or other for profit. Standalone providers' ownership type is simply that of the provider itself. Appendix 3 provides further detail on ownership types.

Private Equity, Charities and RS & CLG each operate about the same proportion (8% to 11%) of the 345k total beds operated by incorporated providers. Family firms operate nearly twice as many beds as any of these three categories (17% of the total). The remaining beds (55% of the total) are 'Other for profit'.

< Table 1 here >

[13] See, e.g., Kotecha (2019), Smith (2018), and https://www.penews.com/articles/pe-owned-uk-care-homes-under-the-spotlight-amid-coronavirus-pandemic-20200322.
[14] This category includes only four groups that are publicly listed, of which three are US-based.
[15] The exceptions are BUPA and Somerset Care.

3.4. Control variables from the CQC and the ONS

The nursing home market in England is highly fragmented. The largest group (HC-One Limited) operates 258 care homes with 15,673 beds, i.e., 4.6% of all beds.[16] The top 50 groups account for nearly half of all the beds (42%). At the other end of the distribution, the 2,149 groups that manage less than 100 beds account for 25% of total capacity.

CQC data has an indicator variable for the services each care home provides: nursing service, dementia service and other non-elderly service. In addition, we use the CQC ratings of care homes.[17] The CQC's overall ratings fall in four bands. As of June 2020, in our working sample 1.2% of care homes were rated Inadequate; 20.8% were Requires Improvement; 73.5% were Good; and 4.5% were Outstanding. In addition to the overall ratings, there are ratings on five other aspects – caring, effective, responsive, safe and well-led. We create a dummy variable called 'bad rating' if the safe category is rated either Inadequate or Requires Improvement.

England is divided for administrative purposes into 343 Local Authorities (LAs). LAs range in population size from 2,259 (Isles of Scilly) people to 1,554,636 (Kent County Council); and in geographical size from 3 square kilometers (City of London) to 5,014 (Northumberland). London is divided into 33 LAs (Westminster, Camden, Ealing, City of London etc.). Our working sample contains 25 care homes on average in an LA, with half of the LAs having between 14 and 30 care homes.

We measure the concentration of care homes in an LA using the Herfindahl-Hirschman Index. We also obtain the population density of each LA from the ONS.[18] Finally, we define 'hospital pressure' in each LA as Covid deaths in hospital per 1,000 inhabitants as reported by the ONS.

3.5. Measuring death rates

CQC has provided us with data on COVID-19 deaths -- sub-classified as confirmed and suspected. The data are per week, per care home from April 10th, 2020 – date at which it started to track this information.

The CQC states that: 'The inclusion of a death in the published figures as involving COVID-19 is based on the statement of the care home provider (…) These are notifications of deaths

[16] Unless mentioned otherwise, statistics reported refer to the working sample.
[17] The CQC aims to inspect each nursing home at intervals that range from 6 to 30 months, depending on the level of the home's most recent overall rating. The CQC assigns ratings that cover individual aspects of the service provided along with an overall rating.
[18] Table P04UK 2011 Census: Population density, local authorities in the United Kingdom.

of people in care of the provider, who is required to inform the CQC of deaths of those under their care regardless of the cause of death or where the death occurred.'

This is important because it implies that, in principle, the provider must notify the CQC of the death of a resident whether or not it happened in the care home. Thus, if a care home resident is discharged to a hospital and passes away at the hospital, a priori, our data should record this as a care home death.

The number of deaths needs to be scaled. However, we do not know the number of residents in each care home at each point in time, but we have a proxy for the number of beds available in a care home. When registering, a care provider reports the 'Max Service Users' and this is the variable we use to scale the number of deaths.

We also obtain from the CQC, the number of deaths in each care home in 2019, and we also scale these by 'Max Service Users.' By adding the death rate over the same period in the prior year, we partly correct for the noise in the denominator. An alternative would be to use the growth in death rates from one year to the next, but many care homes had no deaths in 2019.

4. Key Variables and Descriptive Analysis

4.1 Measuring leverage

In the literature, debt is usually defined as the sum of short-term and long-term debt (e.g., Michaely and Roberts (2012); Bernstein, Lerner, and Mezzanotti (2019)).[19] For our purposes, the most important adjustment to this definition is the liability related to operating leases. Under the accounting standards that most companies in our sample follow (FRS102), when they use operating leases to rent care homes, they reduce both the asset (they did not have to buy the asset) and liability side of their balance sheets (debt used for the acquisition is not present). This creates an inconsistency between the groups that own the care homes they operate and those that rent the homes from a third party. It is therefore necessary to capitalize operating leases, i.e., estimate the value of the care homes being leased and add this amount to both the Debt figure and the Total Asset figure.

In practice, lenders and credit rating agencies capitalize operating leases by applying a multiple to operating lease rental expenses. Two of the biggest lessors of care homes in the UK are

[19] We use FAME variables "Short Term Loans & Overdrafts" plus "Long Term Debt".

quoted REITs called Impact Healthcare and Target Healthcare. These REITs report the fair value of care homes on their own balance sheets, and the lease rental income that the care homes pay to the REIT. Dividing the former by the latter produces a multiple of 13. We therefore take the FAME data item called 'Land & Building or Property Rents & Other' – which we simply refer to as 'rent' -- and multiply it by 13. We then add this amount both to Debt and to the reported Total Assets.

Importantly, six large groups in our sample have adopted new accounting standards that address the operating lease issue. These new standards require users to account for both operating leases and the corresponding asset on the balance sheet; but they define the value of the operating leases as the present value of the contractual payments remaining on existing operating lease agreements. The resulting value therefore simply reflects the remaining average life of existing operating lease contracts, rather than being a proxy for the fair value of the asset. To put these groups on the same basis as the rest of the sample, we reverse the accounting changes they have implemented and then apply the 13 times multiple in the way already described.

Importantly, adjusting for operating leases requires a Profit and Loss statement (P&L). Unfortunately, submitting a P&L is only mandatory for companies that have certain characteristics, mostly related to their size (defined in terms of turnover, assets and employees). In our working sample, 27% of the groups (managing 71% of all the beds) submit a P&L (Table 1 – Panel D).

4.2 The Cross Section of Leverage Ratios

Table 2 – Panel A shows the distribution of different leverage ratios in the sub-sample for which we have P&L statements. Four different ratios are shown depending on whether we measure leverage at the provider or at the group level and whether we adjust for operating leases or not. Leverage at the group level is much lower than at the provider level. Leverage after adjusting for operating leases is usually, but not always, higher.

Table 2 – Panel B shows the coefficients of correlation between these different leverage ratios. Adjusting for operating leases changes the leverage about equally at the provider level and at the group level; in each case the correlation between the ratio before and after the adjustment is about 85%. This high correlation reflects the fact that only 80% of the groups that file P&L statements do not have any operating leases at all (Table 2 – Panel C).

We see in Table 2 – Panel C that the likelihood of using operating leases increases with group size. More than half of the groups that manage 1000 beds or more, representing half of the

overall sample, use operating leases. In contrast, 17% of the groups that manage *less* than 1000 beds have operating leases in place.

For the groups managing less than 100 beds, lease rental expenses on average represent only 0.4% of Total Assets. This statistic is important because more than 90% of the groups for which we do not have a P&L have less than 100 beds. It is therefore reasonable to assume that these groups have no operating leases and, we can then include them in our analysis.

Table 2 – Panel D shows that leverage is strongly related to the number of beds operated by the group. Groups with less than 100 beds have an average leverage ratio of 20% whereas groups operating 1000 beds or more have an average leverage ratio of 69%.

Table 2 – Panel E shows the leverage ratio distribution at the care home level broken down by ownership type. Charity-run care homes have the lowest leverage: only 45% of them have debt at all. RS&CLG, although not run for profit, have higher leverage: 19% on average. Unsurprisingly PE-controlled care homes have the highest leverage, with a median of 88% and a relatively narrow interquartile range. Family-run and other for-profit care home groups have similar leverage at about 40%, on average.

< Table 2 here >

4.3 Aggregated Mortality Data

Figure 3 shows the number of deaths in England reported by the Office of National Statistics (ONS). Statistics are shown from week 12 (March 16th to 22nd 2020), which is the week when death certificates started to mention COVID-19. The end date is week 60 (February 12th to 19th 2021), which is the last week for which we have CQC data on per care home death rates. These data are at weekly frequency and split by places of death: hospitals, care homes and elsewhere. Importantly, care home residents who died in a hospital are added to the hospital figure in the ONS data, whereas in our data it is added to the care home death toll. Conversely, ONS data include care home deaths in all the care homes that are not in our working sample.

The peak occurred in week 15 in hospitals with almost 6,000 deaths, and one week later in care homes with about 2,400 deaths. The number of deaths decrease quickly to near zero by week 28. In week 23, the number of COVID-19 deaths in care homes goes below 500 and we set this week as the first week that is 'between waves.' Coincidentally, but importantly, week 23 (the end of the first wave) coincides with the beginning of a government program to help care homes financially, via a £600 million worth Infection Control Fund. On Week 48, the number

of deaths in care homes is again above 500 and we take this week as the starting week of the second wave. On week 61, this figure is again below 500. We then define wave two as spanning week 48 to 60.

< Figure 3 here >

Table 3 compares the figures in our CQC dataset to those from the ONS. The number of deaths in care homes according to the ONS data are similar but a bit lower than in our sample, probably because the ONS reports only the deaths that occurred in care homes. The discrepancy is wider for the first wave because care home residents were frequently 'discharged' onto hospitals. Note also that there are twice as many deaths during the seven weeks that lasted the first wave and over the following six months (between waves). The second wave is twice as long as the first wave but with less deaths in total.

During the first wave, 45% of the care homes in the working sample had at least one resident who died of COVID-19. Conditional on at least one death occurring, death rates vary greatly across care homes. Figure 4 shows that in the first wave the log of death rates is close to normally distributed among care homes with at least one death.

< Table 3 here >

4.4 Death Rates and Key Care Home Characteristics

Table 4 – Panel A shows the death rate in each wave broken down by ownership type. In the first wave – which is when the pandemic was most severe – PE-controlled care homes stand out with a death rate that is more than 50% higher than average at 5.5%. RS&CLG comes next. The other ownership types have similar death rates, with family-owned care homes having the lowest death rate. PE-controlled care homes still have a higher death rate in between waves, but a lower death rate in the second wave.

The care homes that were excluded from the working sample have lower death rates in all three time periods. These care homes are small, and Panel B shows that size is a key determinant of death rates in each leverage category during the first wave. The size effect is less pronounced in between waves and during the second wave but the smallest care homes (those with less than 25 beds) always have the lowest death rates.

In Table 4 – Panel B we also see that death rates increase with leverage but only for care homes that are sufficiently large. Starting with the third size-quintile, the relationship between death rate and leverage is nearly always monotone. Among the smallest two size-quintiles, we do not

observe a correlation between leverage and death rate. In addition, the correlation between leverage and death rate is only observed during the first wave.

The reason why leverage seems to matter only for large care homes may be that the larger care homes are those who faced the largest shock. Small care homes seldom had COVID-19 cases whereas larger care homes almost surely had some. Hence, if high leverage impedes swift management actions to fight the crisis, then we should observe the highest death rates in large and highly-levered care homes, and not in other types.

From Panel B, we also see the distribution of care homes by size and leverage. 1,396 care homes (18% of all care homes) have no leverage at all. About as many (1,860 care homes) have high leverage (above 70%). Unlevered care homes have a death rate of only 2.6% during the first wave. Highly levered care homes have a death rate that is nearly twice as much, which is a considerable spread. Strikingly, we do not observe any such spread in between waves and during the second wave.

< Table 4 here >

5. Regression Analysis

5.1. Where Leverage Matters

The dependent variable – death rate – has a cluster at its lower bound (55% of the observations are zero). We therefore estimate all the specifications using Tobit regressions. Results in Table 5 are shown for our working sample and for death rate during the first wave only. We begin with a specification with only ownership types. Specifications (1) and (2) show that PE-controlled care homes have significantly higher death rates.

In specification 2, we control for size. Size is by far the most important explanatory variable in this specification. Possibly, larger care homes having more residents, they have a greater chance of having one person contaminated, who would then transmit it to others.

As PE-controlled care homes tend to be larger, a large part of the higher death rate in PE-controlled homes is explained by the larger size of the care homes they manage. In addition, care homes that cater to more fragile residents – those offering dementia and nursing services – have higher death rates. PE-controlled care homes are also more likely to offer these services and controlling for these service halves the coefficient on PE (non-tabulated).

We also note that local hospital pressure is highly significant, which makes sense. However, quality rating that the CQC assigns shows no relationship with death rates. Competitive pressure – areas with many care homes versus not – also plays no role in explaining variations in death rates. Perhaps surprisingly, population density in the area where the care home is located is also not related to death rates. In contrast, areas with higher ethnic minority populations, and where hospitals reported more COVID-19 deaths, have a higher death rate in their care homes.

From specification (3) onwards we include leverage as an explanatory variable and observe a strong effect. Leverage is highly correlated to size. Having both in the specification (Specification 4) strongly reduces the effect of leverage, but statistical significance remains at a 1% level test. The rest of the control variables do not affect the leverage effect. In terms of economic magnitude, these coefficients imply that predicted death rate is 1.65% more with a care home that is 70% or more leveraged compared to one without leverage. As the mean death rate is 3.7%, such a difference is highly significant economically.

< Table 5 here >

5.2. Where Leverage Does Not Matter

Table 6 shows the specifications where leverage is not related to death rates. We first find that if we measure leverage at the provider level or at the brand level, leverage is unrelated to death rate during the first wave. This result holds even if we adjust for operating leases (specification 1). The coefficient on leverage is always nearly exactly zero. In other words, if we simply took the provider listed in front of each care home, as per the information provided to the public by the regulator, and assigned that provider's leverage to the corresponding care homes, the conclusion would be that leverage does not matter, even if we adjust for operating leases.

Similarly, if we use the information on brands given by the regulator to group together providers, and use a brand's aggregated leverage as the leverage of each care home that belongs to that, we find leverage having no effect (specification 2). In non-tabulated results, we also find that the coefficient on leverage is near zero in specifications 1 and 2, if we do not adjust for operating leases, use other time periods (between the two waves and second wave), and use all deaths and not only COVID-19 deaths. Constructing the corporate ownership structure within which each provider sits is, therefore, essential.

Specification 3 shows that if we do not make the operating lease adjustments but do compute leverage at the group level, leverage is related to death rates but weakly. Hence, adjusting for operating leases is also crucial.

Descriptive statistics in Table 4 indicate that leverage plays no role in explaining death rates after the first wave. This result is confirmed in regression analysis in specifications 4 to 7. With control variables in place, there is only a small positive partial correlation between leverage and death rates.

< Table 6 here >

Results in Table 4 also indicate that leverage has a non-linear effect in that we observe no link between leverage level and death rates when leverage is low, but a strong link when leverage is high. Results in Table 7 show that in a regression setting with all the control variables in place, leverage is unrelated to death rates when below 50%. This result holds for each the three samples. In contrast, when leverage is above 50%, the partial correlation between leverage and death rate is high, but is similar as we move up leverage categories. This result holds in any of the three samples.

< Table 7 here >

5.3 Robustness

Our key result is that there is a strong relationship between leverage and COVID-19 death rates during the first wave. In this sub-section, we assess its robustness. Table 8 – Panel A shows that our key result holds in samples other than the default sample, and also holds if we do not correct FAME data. We find that results are stronger when using the smaller dataset -- the sub-sample for which we have P&L accounts -- i.e., the sample for which we do not make an assumption about lease rental expenses for small groups.

Table 8 – Panel B shows that our key result holds if we use all the deaths reported in each care home, and not just the ones related to COVID-19. The coefficient is, however, weaker economically. This result is important because it shows that it is where the pandemic was severe that leverage made a difference. Consistent with theory, leverage does not help to explain why some care homes have more deaths in normal times. Leverage matters where there is a crisis.

One advantage of our setting is that because care homes in England represent a relatively homogeneous set of assets there is no reason to expect meaningful differences in required yields on operating leases. Using the same multiple of annual rent for all care homes is therefore

reasonable. The choice of multiple, however, could be disputed. For example, Serfling (2016) uses 10x whereas we use 13x. In Table 8 – Panel C, we show that results are unaffected when we change the coefficient to 5x, 10x and 15x.[20]

PE firms in the UK typically invest most of their equity using shareholder loan notes or similar instruments. Reasons may include (i) tax and (ii) the desire to shift operating managers' equity stake further out of the money to create so-called high-powered incentives (Phalippou (2021), chapter 4). Non-PE owners also sometimes provide loans to the companies they own. It is debatable whether such shareholder loans should be treated as debt, as is the case by default in our study, and in the literature, or whether it should be treated as equity.

The rationale for excluding PE shareholder loans from debt and therefore from leverage ratios is that unlike most third-party debt, such loans typically require minimal to no contractual cash payments, are long-term, and a lender who is a shareholder (rather than a third party) is unlikely to take legal actions in case of financial distress.

Shareholder loans are generally reported in FAME as one of four items: Group Loans (short term), Group Loans (long term), Director Loans (short term), Director Loans (long term). For PE-controlled groups, however, finding the exact amount of shareholder loan requires a full reading of the annual accounts as details are typically to be found only in the footnotes.

Results are shown in Table 8 – Panel D, specifications 1 and 2. Treating shareholder loans as equity does not affect the coefficient on leverage in the default sample. In the P&L sub-sample, however, the impact is larger; the coefficient decreases from 0.54 to 0.40 (Table 8-Panel A-spec 2 versus Table 8-Panel -spec 2). Leverage remains nonetheless statistically related to death rates at a 1% level test.

Another reasonable adjustment to make when computing leverage ratios involves Total Assets. When a group has grown through acquisition, its balance sheet may include intangible assets that reflect any difference between the price paid for assets and their book value. Accounting rules generally require these intangible assets to be amortized over time through an annual non-cash charge in the income statement. This process distorts reported assets, relative to the actual

[20] A multiple of 5x is quite extreme and produces weaker results, but the coefficient on leverage remains statistically significant at a 1% level test. Using a multiple of 10x or 15x, however, hardly makes a difference. Also, with a 5x multiple, it is the result on the working sample that is most affected. The result on the P&L sub-sample is hardly affected. See Appendix 2.

capital that has been invested.[21] We adjust for this issue where applicable by replacing net intangible assets with gross intangible assets. Note that this figure (gross intangible assets) is only available in the footnotes to the annual accounts and FAME does not contain the variable necessary to make this adjustment; we therefore do it manually. Doing this has the effect of adding back all the accumulated non-cash amortization charges so as to restore the amount that was invested in the asset in the first place.[22] Results are unaffected.[23]

For providers linked by common ownership but not producing consolidated accounts, we aggregated their balance sheet to create their group leverage. If we reverse that step, and keep these providers as standalones entities, the leverage reported for all providers belonging to non-consolidated groups change. Table 8 – Panel E specifications 1 and 2 show that this change does not change our key result. Next, specification 3 and 4 show that netting cash from debt has a large effect on the coefficient for leverage but statistical significance remains.

Finally, Table 8 – Panel G shows that our results are unaffected if we change the starting and ending date of the first wave.

< Table 8 here >

6 Conclusion

Measuring leverage is challenging, even when financial statements are available. We need to identify the full ownership structure within which each provider sits. In addition, the widespread use of operating leases in the sector adds another layer of complexity to the analysis. The nature and quality of the data available mean that this exercise requires several hundred hours of work from someone with extensive experience of reading accounts for this purpose.

Our results suggest one immediate policy implication. The CQC's regulatory approach, which focuses principally on quality of care, could benefit from addressing financial viability. The care home ratings that the CQC provides to the public all address quality of care, assessed at

[21] When an acquisition has been made at a premium to book value, the effect of this process is to see total assets progressively more understated over time, relative to what has been invested. In the less common case of acquisitions made at a discount to book value, the reverse is true. Boucly, Sraer, and Thesmar (2011) is one of the rare studies to acknowledge this issue.

[22] We do not adjust for depreciation expense on tangible fixed assets. The reason is that tangible assets (unlike intangible ones) by definition do experience physical wear and tear, which cash spending on maintenance capital expenditure then aims to offset.

[23] Note that sector significantly affects the extent to which making this adjustment will affect financial ratios. Care homes are significant tangible assets, making this an 'asset-heavy' sector. When a premium is paid in an acquisition in this sector, the premium will generally be allocated to tangible assets. Such assets will subsequently be subject to both depreciation expense and capital expenditure: the problem that comes from amortizing intangible assets is therefore less significant. In 'asset-light' sectors such as service industries, the reverse applies.

the level of the individual provider. The CQC also vets each provider's Registered Manager and a 'nominated individual'. But a member of the public consulting the CQC website about a given care home provider will find no information about who owns or controls that provider; nor about its financial sustainability.

It was the 2011 bankruptcy of the UK's largest care provider, Southern Cross, that led to 2014's Care Act. The Market Oversight Scheme that forms part of this new legislation gave the CQC a statutory duty to monitor the financial health of the largest care providers it regulates. This means the CQC is aware of the issues raised by group ownership of individual care home providers and the financial sustainability of those groups. But the CQC does not provide the public with any information about providers' ownership structures or financial health.

The CQC does make publicly available the membership of what it calls brands. These brands represent the regulator's attempt to indicate when individual providers are related to each other. However, the brand concept lacks any formal definition and does not purport to provide an accurate guide to the group structure and ownership of individual providers. As a result, we find that brand groupings do not always correspond accurately with legal ownership chains

Our finding of a relationship between financial strength and quality of care implies that consumers need financial information in order for this market to work efficiently. Our work also shows that financial condition is a complex issue. Financial data at the level of individual providers (or, as in the US, at the level of individual facilities) may yield no meaningful information about financial health at the group level. Understanding financial health at the group level requires visibility of group ownership structures. Leverage needs to be carefully defined to take account of issues such as operating leases. In this paper we provide some guidance as to how to approach this measurement issue.

Studying the relationship between death rates and ownership type is particularly relevant in the context of a global trend towards the privatization of care services. In England, as in many other countries, over 80% of care homes were in the state sector 30 years ago. Today, that proportion has been reversed. For-profit companies may offer stronger financial incentives, be more professional and better resourced, especially if they are controlled by private equity firms. For example, they may react more quickly to the pandemic. Suggestive evidence in other industries abounds in this direction (e.g. Cohn, Nestoriak, and Wardlaw (2016); Bernstein and Sheen (2016)). Our evidence also supports this view, but the high leverage used by some for-profit organizations seems to dent these benefits.

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Table 1. Sample Description

The table provides sample description in terms of ownership type (Panel A), group types in working sample (Panel B), source of financial accounts (Panel C), availability of profit & loss accounts in working sample (Panel D). Bed numbers are given in thousands (hence the 'k').

Panel A: Ownership Type

Ownership	Definition and Identification	Providers	Homes	Beds
These first two categories are out of the working sample because providers are not incorporated				
Individuals & Partnerships	Providers that self-identify as individual or partnership, thus not an incorporated entity.	735	847	22k
Government	Local government operated care homes.	48	180	7k
These two categories are not-for-profit providers (and incorporated)				
Charity	Companies with non-profit legal forms that are regulated by the Charity Commission.	265	733	32k
RS&CLG	Companies with non-profit legal forms that are not regulated by the Charity Commission and report to either the FCA (*Registered Societies)*, or to Companies House (*Companies Limited by Guarantee*).	116	549	28k
These three categories are for-profit (and incorporated)				
PE	If controlled by a Private Equity firm.	86	623	37k
Family	If same last name for all the directors.	1,203	1,595	60k
Other	For-profit but neither PE nor Family.	2,683	4,233	188k
Total		5,136	8,760	374k
Total incorporated providers		4,353	7,733	345k
Providers with financial accounts (working sample)		4,223	7,585	340k

Panel B: Group Types in Working Sample

	Groups	Providers	Homes	Beds	% Beds
Standalone providers	1,936	1,936	2,633	91k	27%
Consolidated groups	273	754	2,686	149k	44%
Non-consolidated groups	478	1,533	2,266	101k	30%
Total	2,687	4,223	7,585	340k	100%

Panel C: Source of Financial Accounts (total incorporated providers)

	Financial accounts available in FAME			Financial accounts obtained manually			No financial accounts		
	Groups	Homes	Beds	Groups	Homes	Beds	Groups	Homes	Beds
Charity	152	579	26k	71	111	5k	40	43	1k
RS&CLG	4	184	10k	53	333	17k	29	32	1k
PE	15	623	37k	0	0	0k	0	0	0k
Family	844	1,567	59k	0	0	0k	20	28	1k
Other	1,544	4,125	182k	4	63	4k	35	45	2k
Total	2,559	7,078	314k	128	507	26k	124	148	5k

Panel D: Availability of Profit & Loss Accounts in Working Sample

	Profit & Loss Statement Available			Profit & Loss Statement Not Available		
	Groups	Homes	Beds	Groups	Homes	Beds
Charity	221	688	31k	2	2	0k
RS&CLG	56	516	27k	1	1	0k
PE	15	623	37k	15	623	37k
Family	114	468	24k	730	1,099	35k
Other	319	2,267	123k	1,229	1,921	63k
Total	725	4,562	242k	1,962	3,023	98k

Table 2. Computing Leverage Ratios

The table shows our process of computing leverage ratios for analysis. All statistics in the table are based on the P&L sample. In Panel A, summary statistics for provider level leverage are drawn from a sample size of 1,463 providers and those with groups from a sample size of 725 groups. Panel B shows the correlations between the four leverage measures in Panel A, based on 4,562 homes, winsorized at 100%. Panel C and Panel D provide information regarding operating leases and lease adjusted group leverage, by group size. Panel E shows summary statistics of lease adjusted group leverage by ownership type. Leverage is defined as (total debt / total assets). Lease adjusted leverage is defined as (total debt + 13xleases) / (total assets + 13xleases).

Panel A: Distribution of Leverage Ratios

	25th prctile	50th prctile	75th prctile	95th prctile	99th prctile	# obs.
1. Provider leverage	1.41%	33.41%	62.69%	149.06%	422.31%	1,463
2. Lease adjusted provider leverage	2.62%	37.61%	68.74%	136.94%	399.66%	1,463
3. Group leverage	0.00%	27.63%	50.85%	81.36%	117.60%	725
4. Lease adjusted group leverage	0.22%	30.66%	54.18%	86.48%	114.32%	725

Panel B: Correlation Matrix (Care Home Level)

	(1)	(2)	(3)	(4)
1. Provider leverage	1.00			
2. Lease adjusted provider leverage	0.85	1.00		
3. Group leverage	0.35	0.24	1.00	
4. Lease adjusted group leverage	0.33	0.41	0.81	1.00

Panel C: Operating Leases and Group Size

Group size (by bed count)	% with Lease expense > 0	Mean Lease expense/TA	Groups	Homes	Beds
10-100	14%	0.4%	366	494	18k
100-500	21%	0.5%	266	1,143	56k
500-1000	20%	5.5%	54	715	36k
1000-5000	64%	11.5%	33	1,276	75k
5000+	100%	7.6%	6	934	56k
Total	20%	1.4%	725	4,562	242k

Panel D: Lease Adjusted Group Leverage and Group Size

Group size (by bed count)	% Leverage > 0	Median Leverage	Mean Leverage
10-100	58%	2.6%	19.9%
100-500	94%	43.5%	42.8%
500-1000	98%	43.9%	43.8%
1000-5000	100%	69.6%	67.2%
5000+	100%	83.1%	69.8%
Total	77%	30.7%	32.7%

Panel E: Lease Adjusted Group Leverage by Ownership Type

	% Leverage > 0	Mean Leverage	25th prctile	50th prctile	75th prctile	Groups
Charity	45%	8.8%	0.0%	0.0%	10.0%	221
RS&CLG	64%	18.6%	0.0%	3.5%	34.4%	56
PE	100%	86.6%	78.4%	87.5%	100.0%	15
Family	94%	40.0%	25.3%	38.9%	55.6%	114
Other	94%	46.5%	29.4%	47.1%	64.1%	319
Total	77%	32.7%	0.2%	30.7%	54.2%	725

Table 3. COVID-19 Mortality in England

The table shows Covid-19 mortality statistics in England, in different time periods and from different data sources. Weeks start with first week of January 2020 (week 1 starts from Dec 30 2019 to Jan 5 2020). Last week (week 60) is Feb 13 to 19, 2021. Mortality from CQC data is the number of Covid death notifications (confirmed plus suspected) received by CQC. Mortality from ONS data is the number of Covid deaths (by local authority and cause of death and by place of occurrence).

		CQC data		ONS data	
	Weeks	Full sample	Working sample	Care home	Hospital
Pre-Wave	12-15	n.a.	n.a.	2,027	11,823
First-Wave	16-22	15,945	15,002	11,153	16,781
Between-Waves	23-47	4,405	4,094	3,552	12,228
Second-Wave	48-60	14,333	13,208	12,360	44,171
Total	16-60	34,683	32,304	29,092	85,003

Table 4: Death rates and Key Care Home Characteristics

The table provides statistics on death rates per care home. Panel A shows death rate by ownership type, in different waves. In Panel B, means of death rates are shown by groups that are independently and double sorted (size x leverage) from the working sample. Death rate is defined as the number of Covid death notifications (confirmed plus suspected, received by CQC) over care home size. Care home size is the number of 'max service users' (reported to CQC). Leverage is the lease adjusted group leverage ratio.

Panel A: Death Rate by Ownership Type

	#Homes	First Wave	Between Waves	Second Wave
Working Sample (incorporated entities with financial data)				
Private Equity	623	5.51	1.46	3.23
Family	1,567	3.31	0.97	3.79
Other	4,188	3.55	1.19	4.01
Charity	690	3.76	0.77	3.63
RS&CLG	517	4.52	1.18	3.86
Local governments	180	3.23	0.65	3.28
Individuals/Partnerships	847	2.09	0.83	3.13
Incorporated entities, no financial data	148	2.42	0.77	2.98
	8,760	3.55	1.08	3.76

Panel B: Mean Death Rates in Care Homes by Size and Leverage in Working Sample

	Unlevered (0%)	Low (1%-35%)	Medium (35%-70%)	High (70%+)	All
First Wave					
Small (10-25)	1.66	1.90	1.78	1.18	1.70
Q2 (26-35)	2.68	2.55	2.43	2.57	2.54
Q3 (36-55)	3.38	3.81	4.47	4.90	4.27
Q4 (56-75)	4.23	4.67	5.10	6.11	5.37
Big (76-215)	5.17	4.99	5.73	6.30	5.80
All	**2.57**	**3.35**	**3.83**	**4.90**	3.75
Between Waves					
Small (10-25)	0.83	0.74	0.42	0.95	0.72
Q2 (26-35)	0.73	1.07	1.28	1.20	1.08
Q3 (36-55)	1.38	1.20	1.08	1.38	1.23
Q4 (56-75)	1.51	1.29	1.25	1.54	1.40
Big (76-215)	0.60	0.99	1.51	1.17	1.22
All	0.97	1.07	1.09	1.34	1.13
Second Wave					
Small (10-25)	2.99	3.03	3.93	3.39	3.28
Q2 (26-35)	3.85	3.41	4.19	4.14	3.89
Q3 (36-55)	3.94	4.27	4.46	3.81	4.17
Q4 (56-75)	3.32	4.22	3.95	4.24	4.08
Big (76-215)	2.60	3.07	3.59	3.52	3.41
All	3.45	3.72	4.15	3.89	3.85
Number of care homes	1,396	1,804	2,525	1,860	7,585

Table 5: Death Rates, Ownership Type, and Leverage during the First Wave

Results from Tobit robust estimations. The dependent variable is the natural logarithm of (1+(100*number of confirmed plus suspected Covid-19 deaths divided by max service users of care home)). Ownership type categories are defined in Table 1; Leverage is the lease adjusted group ratio, winsorized at 100%; Home size is the natural logarithm of the max service users of a care home. Service: Nursing is 1 if the primary service type of a care home indicates "Care home service with nursing", and is 0 otherwise; Service: Dementia is 1 if the service user band – Dementia indicates "Y", and is 0 otherwise; Bad rating is 1 if the rating on the Safe category is "Inadequate" or "Requires improvement" and is 0 otherwise; Death rate Q2-2019 is the natural logarithm of (1+(100*death notifications reported to CQC in Q2- 2019 divided by max service users of care home); Local competition is the HHI of care home sizes, measured at the local authority level; Population density is the natural logarithm of one plus persons per hectare (source: ONS); Ethnic minorities is the natural logarithm of (100*(Total population - White British - All Other White)/Total population)+1); Hospital pressure is Covid death in hospital per one thousand inhabitant in the local authority area. LA stands for Local Authority. T-statistics are shown in parentheses. *, ** and *** indicate statistical significance at 10%, 5%, and 1% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
Private Equity	0.61***	0.25***	0.16*	0.05	0.01	0.10
	(7.01)	(2.99)	(1.66)	(0.56)	(0.14)	(1.08)
Family	-0.12	0.09	0.04	0.18**	0.17**	0.14**
	(-1.61)	(1.38)	(0.60)	(2.55)	(2.51)	(2.07)
Charity	0.03	0.27***	0.32***	0.16*	0.29***	0.37***
	(0.30)	(3.06)	(3.26)	(1.76)	(3.10)	(4.02)
RS&CLG	0.47***	0.31***	0.56***	0.27***	0.36***	0.35***
	(4.78)	(3.36)	(5.67)	(2.84)	(3.77)	(3.80)
Leverage			1.08***	0.37***	0.34***	0.41***
			(11.97)	(4.08)	(3.82)	(4.49)
Home size		1.27***		1.54***	1.17***	1.20***
		(20.95)		(27.83)	(18.76)	(19.39)
Service: Nursing		0.57***			0.51***	0.57***
		(9.78)			(8.75)	(9.77)
Service: Dementia		0.36***			0.33***	0.34***
		(5.53)			(5.07)	(5.23)
Bad rating		0.02			0.05	0.02
		(0.30)			(0.81)	(0.41)
Death rate Q2-2019		0.16***			0.16***	0.16***
		(5.39)			(5.73)	(5.37)
Local competition		-0.00				-0.01
		(-0.02)				(-0.15)
Population density		0.02				0.03
		(0.68)				(0.87)
Ethnic minorities		0.23***				0.22***
		(5.97)				(5.86)
Hospital pressure		2.64***				2.69***
		(12.36)				(12.60)
Pseudo R^2	0.051	0.077	0.058	0.093	0.101	0.078
LA Fixed Effects	Yes	No	Yes	Yes	Yes	No
# Observations	7585	7585	7585	7585	7585	7585

Table 6: When Leverage does not matter

This Table runs the same regressions as Table 5 Specification 5. The difference is that death rates are measured either during the first wave, in between the two waves, or during the second wave; death rates may be computed with only COVID-19 deaths or with all deaths; and leverage may be computed at the provider, brand or group level, and be either adjusted for operating leases or not.

Which Wave?	First	First	First	Between	Second	Between	Second
Death type	COVID	COVID	COVID	COVID	COVID	All	All
Leverage level	Provider	Brand	Group	Group	Group	Group	Group
Lease adjustment:	Yes	Yes	No	Yes	Yes	Yes	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Leverage	0.02	-0.00	0.19*	0.11	0.09	0.04	-0.00
	(0.25)	(-0.03)	(1.90)	(0.90)	(0.89)	(1.13)	(-0.04)
Private Equity	0.14*	0.14*	0.06	-0.03	-0.33***	-0.16***	-0.21***
	(1.68)	(1.68)	(0.64)	(-0.24)	(-3.03)	(-4.66)	(-4.39)
Family	0.13*	0.13*	0.14**	0.06	-0.11	0.04	-0.05
	(1.95)	(1.91)	(2.09)	(0.69)	(-1.44)	(1.33)	(-1.49)
Charity	0.20**	0.20**	0.25***	0.00	-0.08	-0.09**	-0.04
	(2.25)	(2.18)	(2.67)	(0.01)	(-0.74)	(-2.28)	(-0.74)
RS&CLG	0.32***	0.32***	0.33***	0.14	-0.01	0.03	-0.08
	(3.40)	(3.38)	(3.53)	(1.07)	(-0.07)	(0.73)	(-1.56)
Home size	1.22***	1.22***	1.20***	0.97***	0.80***	0.17***	0.31***
	(19.89)	(19.62)	(19.57)	(11.81)	(11.28)	(6.04)	(8.92)
Service: Nursing	0.51***	0.51***	0.51***	0.32***	0.06	0.34***	0.23***
	(8.72)	(8.73)	(8.73)	(4.07)	(0.94)	(14.21)	(7.72)
Service: Dementia	0.34***	0.34***	0.33***	0.21**	0.28***	0.09***	0.13***
	(5.31)	(5.31)	(5.14)	(2.46)	(3.79)	(3.66)	(4.02)
Bad rating	0.04	0.04	0.04	-0.16**	-0.10	-0.14***	-0.17***
	(0.74)	(0.73)	(0.75)	(-2.11)	(-1.51)	(-5.75)	(-5.41)
Death rate Q2-2019	0.16***	0.16***	0.16***	0.17***	0.18***	0.24***	0.21***
	(5.75)	(5.75)	(5.76)	(4.41)	(5.46)	(19.31)	(13.90)
Pseudo R^2	0.100	0.100	0.100	0.085	0.045	0.085	0.050
LA Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# Observations	7585	7585	7585	7585	7585	7585	7585

Table 7: Non-linearity of Leverage Effect

This Table runs the same regressions as Table 5 Specification 5. Note that specification 2 adds two control variables: a dummy variable for whether the care home is run by a local government (1/0) and a dummy variable for whether the care home is run by an individual or partnership (1/0); see Table 1 for definitions. We assume that leases are zero for groups with no P&L, and zero leverage for care homes owned by local governments and individuals/partnerships. Results are shown for three different samples: the default sample, the extended sample and the P&L sample. All the explanatory variables are the same except for leverage which is replaced by five dummy variables that equals one if the leverage ratio is within a given range and equals zero otherwise.

Sample:	Default	Extended	P&L
	(1)	(2)	(3)
Leverage is between 10%-30%	-0.02	-0.04	0.11
	(-0.25)	(-0.42)	(0.80)
Leverage is between 30%-50%	0.05	0.05	0.19
	(0.58)	(0.63)	(1.55)
Leverage is between 50%-70%	0.20**	0.22**	0.37***
	(2.29)	(2.50)	(2.88)
Leverage is between 70%-90%	0.28***	0.29***	0.46***
	(3.07)	(3.19)	(3.52)
Leverage is above 90%	0.26**	0.26**	0.48***
	(2.52)	(2.52)	(3.36)
Private Equity	0.00	-0.00	0.00
	(0.03)	(-0.01)	(0.05)
Family	0.17**	0.16**	0.24**
	(2.52)	(2.31)	(2.50)
Charity	0.29***	0.23**	0.33***
	(3.15)	(2.48)	(3.15)
RS&CLG	0.37***	0.37***	0.28***
	(3.77)	(3.78)	(2.90)
Home size	1.18***	1.22***	1.00***
	(18.77)	(20.21)	(13.56)
Service: Nursing	0.51***	0.51***	0.36***
	(8.73)	(8.91)	(5.44)
Service: Dementia	0.33***	0.35***	0.35***
	(5.12)	(5.65)	(4.63)
Bad rating	0.04	0.05	-0.09
	(0.76)	(0.85)	(-1.34)
Death rate Q2-2019	0.16***	0.16***	0.19***
	(5.75)	(5.96)	(5.68)
Local governments		0.48***	
		(2.70)	
Individuals/Partnerships		0.13	
		(1.12)	
Pseudo R^2	0.101	0.102	0.096
LA Fixed Effects	Yes	Yes	Yes
# Observations	7585	8760	4562

Table 8: Robustness

This Table runs the same regressions as Table 5 Specification 5, with and without leverage as a control. When showing results on the extended sample, two control variables are added: a dummy variable for whether the care home is run by a local government (1/0) and a dummy variable for whether the care home is run by an individual or partnership (1/0); see Table 1 for definitions. We assume that leases are zero for groups with no P&L, and zero leverage for care homes owned by local governments and individuals/partnerships. Panel A shows regression results in different samples. Panel B shows results with all death causes (COVID-19 or not). Panel C shows results with confirmed COVID-19 cases. Panel D reports results with different lease multiples. Panel E reports results with regard to the treatment of shareholder loans and gross tangible assets in computing the leverage ratio. Panel F reports results when reclassifying non-consolidated groups (as consolidated groups or standalones) and when using net debt by considering cash. Panel G reports results when changing the definition of the first wave.

Panel A: Other Samples

Sample:	P&L		Extended		No data Correction	
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage		0.53***		0.36***		0.29***
		(4.50)		(3.96)		(3.25)
Private Equity	0.14*	-0.00	0.14*	0.01	0.14*	0.04
	(1.70)	(-0.04)	(1.68)	(0.06)	(1.68)	(0.41)
Family	0.17*	0.24**	0.12*	0.16**	0.13*	0.17**
	(1.79)	(2.50)	(1.69)	(2.30)	(1.93)	(2.45)
Charity	0.11	0.31***	0.14	0.23**	0.20**	0.27***
	(1.22)	(3.12)	(1.50)	(2.43)	(2.23)	(2.92)
RS&CLG	0.18*	0.30***	0.32***	0.36***	0.32***	0.35***
	(1.95)	(3.09)	(3.37)	(3.77)	(3.39)	(3.71)
Home size	1.04***	1.00***	1.27***	1.21***	1.22***	1.17***
	(14.20)	(13.60)	(21.54)	(20.18)	(20.08)	(18.81)
Service: Nursing	0.35***	0.36***	0.51***	0.51***	0.51***	0.51***
	(5.34)	(5.52)	(8.91)	(8.91)	(8.73)	(8.73)
Service: Dementia	0.37***	0.35***	0.36***	0.35***	0.34***	0.33***
	(4.93)	(4.62)	(5.86)	(5.61)	(5.31)	(5.12)
Bad rating	-0.08	-0.08	0.05	0.05	0.04	0.05
	(-1.30)	(-1.26)	(0.82)	(0.92)	(0.73)	(0.84)
Death rate Q2-2019	0.19***	0.19***	0.16***	0.16***	0.16***	0.16***
	(5.74)	(5.70)	(5.95)	(5.94)	(5.75)	(5.79)
Local governments			0.36**	0.50***		
			(2.08)	(2.86)		
Individuals/Partnerships			0.03	0.16		
			(0.30)	(1.46)		
Pseudo R^2	0.095	0.096	0.101	0.102	0.100	0.101
LA Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4562	4562	8760	8760	7585	7585

Panel B: All Death Causes

Sample:	Default	Default	P&L	P&L	Extended	Extended
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage		0.22***		0.29***		0.20***
		(4.34)		(4.42)		(4.03)
Private Equity	-0.02	-0.10**	0.00	-0.08	-0.02	-0.10**
	(-0.37)	(-2.13)	(0.09)	(-1.63)	(-0.50)	(-2.13)
Family	0.14***	0.17***	0.16***	0.19***	0.14***	0.16***
	(3.98)	(4.59)	(3.09)	(3.73)	(3.91)	(4.48)
Charity	0.02	0.07	-0.01	0.10*	-0.00	0.05
	(0.34)	(1.38)	(-0.22)	(1.77)	(-0.02)	(0.97)
RS&CLG	0.07	0.09*	0.02	0.08	0.07	0.10*
	(1.44)	(1.87)	(0.35)	(1.52)	(1.44)	(1.85)
Home size	0.53***	0.49***	0.44***	0.42***	0.56***	0.53***
	(14.86)	(13.57)	(10.03)	(9.49)	(16.52)	(15.33)
Service: Nursing	0.49***	0.49***	0.38***	0.38***	0.50***	0.49***
	(15.61)	(15.60)	(10.40)	(10.55)	(16.18)	(16.16)
Service: Dementia	0.18***	0.17***	0.24***	0.23***	0.18***	0.17***
	(5.16)	(4.88)	(5.93)	(5.60)	(5.40)	(5.14)
Bad rating	0.02	0.03	-0.08**	-0.08**	0.03	0.03
	(0.76)	(0.82)	(-2.22)	(-2.20)	(0.90)	(0.97)
Death rate Q2-2019	0.19***	0.19***	0.26***	0.25***	0.18***	0.18***
	(11.92)	(11.93)	(12.95)	(12.93)	(11.88)	(11.89)
Local governments					0.02	0.10
					(0.20)	(1.02)
Individuals/Partnerships					-0.02	0.05
					(-0.32)	(0.86)
Pseudo R^2	0.083	0.084	0.100	0.101	0.081	0.082
LA Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7585	7585	4562	4562	8760	8760

Panel C: Confirmed Death Causes

Sample:	Default	Default	P&L	P&L	Extended	Extended
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage		0.30***		0.46***		0.32***
		(3.24)		(3.78)		(3.41)
Private Equity	0.06	-0.05	0.06	-0.07	0.06	-0.06
	(0.68)	(-0.57)	(0.65)	(-0.74)	(0.72)	(-0.61)
Family	0.09	0.12*	0.11	0.17*	0.07	0.11
	(1.20)	(1.72)	(1.10)	(1.72)	(0.97)	(1.53)
Charity	0.16*	0.24**	0.08	0.26**	0.09	0.18*
	(1.73)	(2.49)	(0.88)	(2.54)	(0.96)	(1.79)
RS&CLG	0.26***	0.30***	0.13	0.23**	0.27***	0.30***
	(2.66)	(2.99)	(1.38)	(2.36)	(2.67)	(3.01)
Home size	1.15***	1.10***	0.97***	0.93***	1.19***	1.14***
	(18.15)	(17.04)	(12.74)	(12.26)	(19.37)	(18.22)
Service: Nursing	0.44***	0.44***	0.30***	0.31***	0.45***	0.45***
	(7.24)	(7.26)	(4.51)	(4.67)	(7.53)	(7.53)
Service: Dementia	0.33***	0.32***	0.31***	0.29***	0.35***	0.33***
	(4.86)	(4.67)	(3.88)	(3.63)	(5.27)	(5.05)
Bad rating	0.07	0.08	-0.02	-0.02	0.08	0.08
	(1.26)	(1.34)	(-0.35)	(-0.31)	(1.32)	(1.41)
Death rate Q2-2019	0.16***	0.16***	0.18***	0.18***	0.17***	0.16***
	(5.46)	(5.44)	(5.22)	(5.20)	(5.73)	(5.73)
Local governments					0.10	0.23
					(0.57)	(1.27)
Individuals/Partnerships					0.05	0.17
					(0.48)	(1.45)
Pseudo R^2	0.101	0.102	0.096	0.097	0.101	0.102
LA Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7585	7585	4562	4562	8760	8760

Panel D: Lease Multiples

Lease Multiple:	5x	5x	10x	10x	15x	15x
Sample:	Default	P&L	Default	P&L	Default	P&L
	(1)	(2)	(3)	(4)	(5)	(6)
Leverage	0.24**	0.34***	0.27***	0.39***	0.29***	0.40***
	(2.51)	(2.69)	(3.01)	(3.29)	(3.24)	(3.55)
Private Equity	0.08	0.08	0.07	0.07	0.06	0.07
	(0.94)	(0.99)	(0.78)	(0.86)	(0.69)	(0.77)
Family	0.15**	0.19**	0.16**	0.21**	0.16**	0.21**
	(2.22)	(2.05)	(2.32)	(2.19)	(2.36)	(2.25)
Charity	0.26***	0.23**	0.27***	0.24**	0.27***	0.25**
	(2.79)	(2.27)	(2.87)	(2.47)	(2.88)	(2.53)
RS&CLG	0.34***	0.23**	0.34***	0.25***	0.34***	0.25***
	(3.56)	(2.47)	(3.61)	(2.61)	(3.62)	(2.67)
Home size	1.19***	1.02***	1.18***	1.02***	1.18***	1.01***
	(19.35)	(13.94)	(19.17)	(13.84)	(19.07)	(13.78)
Service: Nursing	0.51***	0.35***	0.51***	0.36***	0.51***	0.36***
	(8.73)	(5.44)	(8.74)	(5.47)	(8.75)	(5.49)
Service: Dementia	0.33***	0.36***	0.33***	0.36***	0.33***	0.36***
	(5.16)	(4.76)	(5.14)	(4.74)	(5.13)	(4.73)
Bad rating	0.04	-0.08	0.04	-0.08	0.04	-0.08
	(0.76)	(-1.32)	(0.77)	(-1.31)	(0.78)	(-1.30)
Death rate Q2-2019	0.16***	0.19***	0.16***	0.19***	0.16***	0.19***
	(5.73)	(5.69)	(5.72)	(5.68)	(5.72)	(5.67)
Pseudo R^2	0.100	0.095	0.101	0.095	0.101	0.096
LA Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Observations	7585	4562	7585	4562	7585	4562

Panel E: Shareholder loans and Gross Intangible Assets

Shareholder Loans Treated as Equity	Yes	Yes	No	No	Yes
Gross Intangible Assets:	No	No	Yes	Yes	Yes
Sample:	Default	P&L	Default	P&L	Default
	(1)	(2)	(3)	(4)	(5)
Leverage	0.36***	0.37***	0.35***	0.54***	0.36***
	(4.00)	(3.31)	(3.83)	(4.54)	(3.96)
Private Equity	0.03	0.07	0.00	-0.02	0.03
	(0.35)	(0.80)	(0.03)	(-0.22)	(0.30)
Family	0.17**	0.21**	0.17**	0.24**	0.17**
	(2.46)	(2.21)	(2.51)	(2.51)	(2.45)
Charity	0.27***	0.23**	0.29***	0.31***	0.27***
	(2.96)	(2.39)	(3.10)	(3.13)	(2.95)
RS&CLG	0.34***	0.24**	0.36***	0.30***	0.34***
	(3.59)	(2.57)	(3.78)	(3.10)	(3.59)
Home size	1.16***	1.02***	1.17***	1.00***	1.17***
	(18.77)	(13.79)	(18.77)	(13.59)	(18.79)
Service: Nursing	0.51***	0.36***	0.51***	0.36***	0.51***
	(8.77)	(5.47)	(8.76)	(5.54)	(8.78)
Service: Dementia	0.33***	0.36***	0.33***	0.35***	0.33***
	(5.11)	(4.74)	(5.07)	(4.60)	(5.11)
Bad rating	0.05	-0.08	0.05	-0.08	0.05
	(0.80)	(-1.30)	(0.82)	(-1.26)	(0.79)
Death rate Q2-2019	0.16***	0.19***	0.16***	0.19***	0.16***
	(5.68)	(5.65)	(5.74)	(5.71)	(5.68)
Pseudo R^2	0.101	0.095	0.101	0.096	0.101
LA Fixed Effects	Yes	Yes	Yes	Yes	Yes
# Observations	7585	4562	7585	4562	7585

Panel F: Change Standalone Definition & Netting Cash from Debt

Adjustment:	Standalone	Standalone	Net cash	Net cash
Sample:	Default	P&L	Default	P&L
	(1)	(2)	(3)	(4)
Leverage	0.38***	0.52***	0.22***	0.41***
	(4.45)	(4.80)	(2.91)	(3.95)
Private Equity	-0.01	-0.02	0.05	0.01
	(-0.09)	(-0.18)	(0.52)	(0.17)
Family	0.17**	0.23**	0.16**	0.24**
	(2.48)	(2.42)	(2.39)	(2.47)
Charity	0.29***	0.30***	0.26***	0.29***
	(3.18)	(3.06)	(2.81)	(2.88)
RS&CLG	0.35***	0.28***	0.35***	0.29***
	(3.73)	(2.95)	(3.67)	(3.01)
Home size	1.16***	1.00***	1.18***	1.00***
	(18.79)	(13.60)	(18.89)	(13.54)
Service: Nursing	0.51***	0.36***	0.51***	0.36***
	(8.74)	(5.47)	(8.73)	(5.48)
Service: Dementia	0.33***	0.35***	0.33***	0.36***
	(5.09)	(4.68)	(5.14)	(4.71)
Bad rating	0.05	-0.08	0.05	-0.08
	(0.84)	(-1.22)	(0.79)	(-1.23)
Death rate Q2-2019	0.16***	0.19***	0.16***	0.19***
	(5.75)	(5.76)	(5.71)	(5.70)
Pseudo R^2	0.101	0.096	0.101	0.096
LA Fixed Effects	Yes	Yes	Yes	Yes
# Observations	7585	4562	7585	4562

Panel G: Change the Definition of the First Wave

Weeks:	Two weeks less (weeks 16-20)		Two weeks more (weeks 16-24)	
Sample:	Default	P&L	Default	P&L
	(1)	(2)	(1)	(2)
Leverage	0.34***	0.46***	0.32***	0.51***
	(3.65)	(3.81)	(3.59)	(4.37)
Private Equity	0.00	0.00	-0.01	-0.03
	(0.01)	(0.01)	(-0.07)	(-0.33)
Family	0.18**	0.21**	0.14**	0.18*
	(2.48)	(2.14)	(1.99)	(1.91)
Charity	0.32***	0.30***	0.26***	0.28***
	(3.33)	(2.96)	(2.85)	(2.85)
RS&CLG	0.34***	0.25**	0.32***	0.26***
	(3.54)	(2.53)	(3.43)	(2.70)
Home size	1.16***	0.98***	1.16***	1.00***
	(18.24)	(13.09)	(18.89)	(13.72)
Service: Nursing	0.47***	0.31***	0.52***	0.36***
	(7.90)	(4.61)	(9.05)	(5.68)
Service: Dementia	0.33***	0.34***	0.34***	0.34***
	(4.94)	(4.36)	(5.31)	(4.48)
Bad rating	0.06	-0.06	0.03	-0.09
	(1.01)	(-0.88)	(0.59)	(-1.43)
Death rate Q2-2019	0.17***	0.20***	0.16***	0.19***
	(5.67)	(5.73)	(5.55)	(5.75)
Pseudo R^2	0.100	0.094	0.101	0.096
LA Fixed Effects	Yes	Yes	Yes	Yes
Observations	7585	4562	7585	4562

Figure 1. UK regulators and legal formats

Primary regulator and source of financial accounts	Legal forms
Companies House	Companies limited by shares
	Limited liability partnerships
	Companies limited by guarantee (CLG)
Charity Commission	Charitable incorporated organisations
	Royal Charter companies
	Unincorporated trusts and associations
Financial Conduct Authority	Registered societies (RS)

Figure 2. Schematic Diagram showing the Relationships Between Different Actors

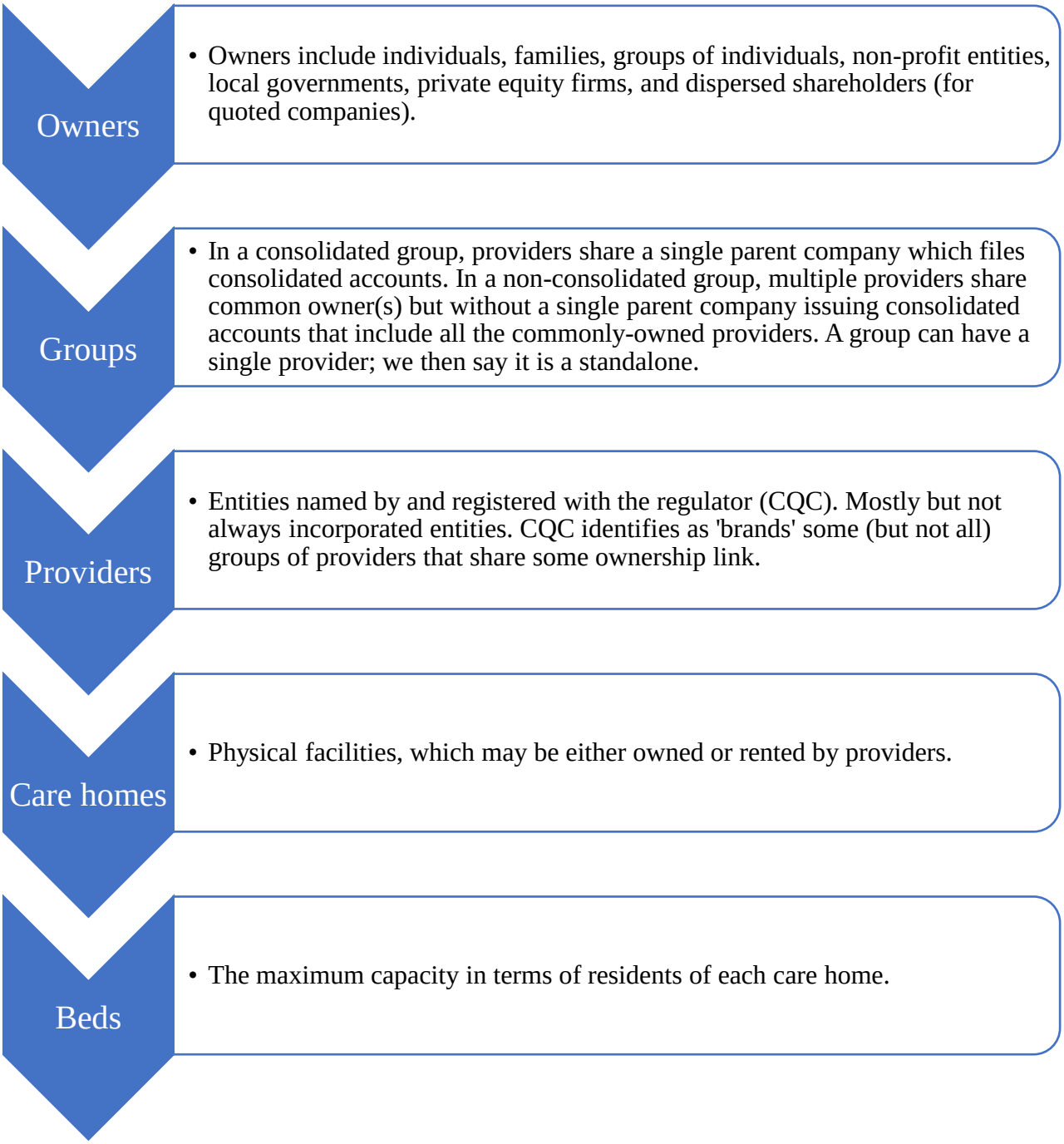
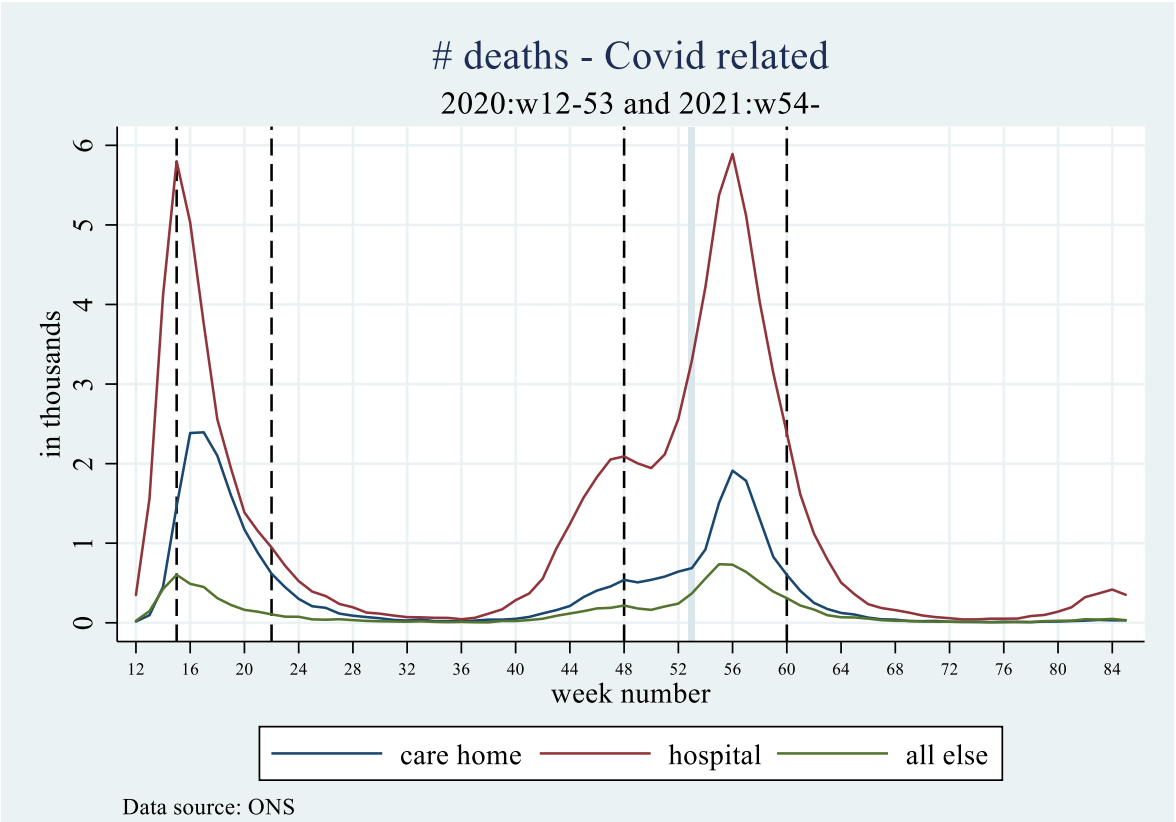
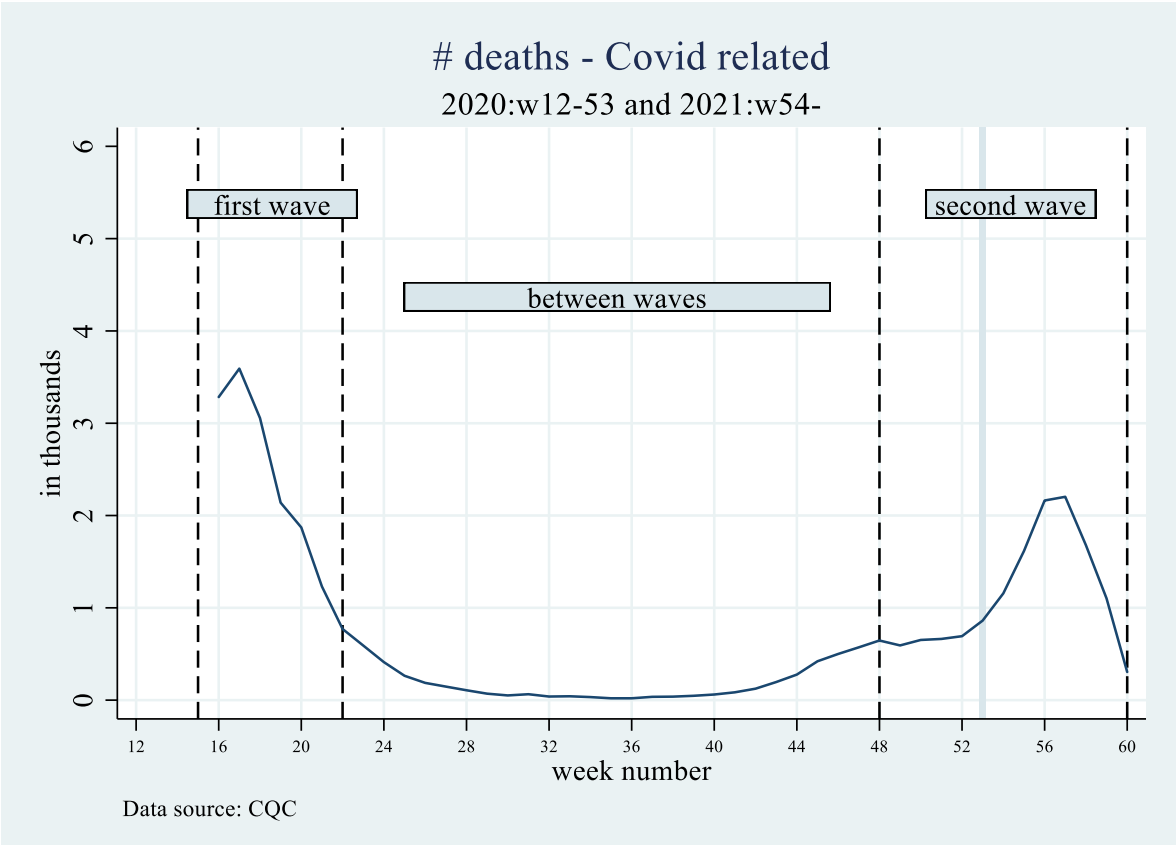


Figure 3. COVID-19 Mortality in England





Online Appendix

Appendix 1. Identifying provider groups

Section 3.3 of the paper describes how we classify providers as either standalone; belonging to a consolidated group; or belonging to a non-consolidated group. We use the term 'consolidated group' to refer to the conventional definition of a corporate group based on two features: that is, companies that share a single corporate parent; and where the parent prepares consolidated accounts that encompass the accounts of all its subsidiaries. We use the term 'non-consolidated group' to refer to a group of companies that are under common control, but where there is no single corporate parent that prepares all-encompassing consolidated accounts. Below we describe how we use a combination of FAME, CQC data and manual checks to identify groups on this basis in the extended sample.

Identifying groups using FAME data

We identify provider groups that share a common corporate parent by using the FAME variable "GUO – Name" (included under Global Ultimate Owner information). FAME defines Ultimate Owner based on two elements: the minimum percentage of control in the path from a subject company to its Ultimate Owner must be 50.01%;[1] and a company is considered an Ultimate Owner (UO) if it has no identified shareholders or if its shareholder's percentages are not known.

Next, we address the second criterion for qualifying as a consolidated group, which is that the group's parent company must file consolidated accounts. FAME's "Legal and accounts information" section contains the variable "Registered accounts type". This assigns each set of accounts to one of a range of types that include "Group" (that is, consolidated), "Dormant", "Full accounts", "Micro-entity accounts", "Small company", "Total Exemption Full", "Unaudited abridged", and "not available".

Table A.1 shows how the two sets of FAME variables interact to produce our three provider group categories.

Using these two FAME criteria we identify 261 consolidated provider groups. These groups comprise 681 providers and 26% of beds in the extended sample. 600 non-consolidated

[1] We replace missing info with GUO names that have the minimum percentage of control exceeding 25.01%. We exclude the option of "Individuals or families" in our search when considering shareholder(s) to be ultimate owners.

provider groups comprise 1,595 providers and 39% of beds. The remaining 2,860 providers are classified as standalone providers and comprise 35% of beds in the extended sample.

Comparing FAME-derived groups to CQC 'brand' data

We test the findings of our FAME-based analysis against other available sources of information. One such source is data that the CQC provides about what it calls 'brands'. The CQC does not provide a detailed definition of what constitutes a 'brand', nor does it publish precise data about the ownership or group structure of individual 'brands' that it identifies. However, the CQC has a legal duty to track the largest corporate groups that control the providers that it regulates. 2014's Care Act gave the CQC a statutory duty to monitor the financial sustainability of the largest providers of adult social care (including both care homes and other services, including non-residential). The CQC meets this requirement through its Market Oversight scheme. In February 2021 the CQC published updated Guidance for providers called 'Market Oversight of "difficult to replace" providers of adult social care'. In its Guidance, the CQC explicitly states that it looks not just at individual providers but at larger corporate groups:

> Where providers form part of a wider corporate group, the size of the whole group i.e. the provider and any of its group undertakings (as defined in section 1161(5) of the Companies Act 2006 – see Glossary) will be taken into account when we assess whether the entry criteria are met. While it is the financial sustainability of individual registered providers that we must determine, matters elsewhere within a wider corporate group are likely to impact on individual registered providers, and this is something which we will take into account.[2]

The CQC defines 'corporate group' as:

> A collection of parent and subsidiary undertakings that function as a single economic entity through a common source of control.[3]

Since this definition is consistent with the way we form our provider groups, we use the CQC's 'brands' as a way to test the accuracy of our methodology based on FAME.

The CQC identifies 202 'brands' among the providers in our extended sample as of about June 2020. Collectively, these brands account for 862 of the 5,136 providers in the extended sample

[2] CQC, "Market Oversight of 'difficult to replace' providers of adult social care", February 2021
[3] Ibid.

and 47% of the beds. We now compare the CQC's 202 'brands' to the results of our two approaches using FAME.

When we compare the CQC's 202 'brands' to the groups formed via shared GUO in FAME, we find that about one-half of the CQC's brands precisely match the groups formed via shared GUO. Another one-third of CQC brands overlap to some extent with the shared-GUO groups do. Only one-seventh of brands do not overlap at all with the shared-GUO groups from FAME. Comparing the CQC's 202 brands to the shared-director approach in FAME reveals a weaker relationship. About one-third of CQC brands precisely match the groups formed in FAME via director overlap; another one-quarter of brands overlap to some extent with FAME shared-director groups. But fully one-third of CQC brands do not overlap at all with the groups formed by director overlap in FAME: twice the proportion seem in shared-GUO groups.

We interpret the comparison of our FAME approach to CQC brands as follows. The narrative in the CQC's February 2021 Market Oversight document shows the CQC defines groups in broadly the same way we do. It come as no surprise therefore to find that our analysis of group profiles is broadly consistent with the CQC's brands. But our results using FAME are more comprehensive. Using the director name overlap in particular helps to identify groups under common control that would not otherwise be apparent. The difference can be expressed most clearly in terms of beds. The CQC's 202 brands comprise 47% of beds in the extended sample; the implication is that the remaining 53% of all beds are operated by providers that are independent of each other. Our analysis using FAME identifies that a higher proportion of beds (65%) are being run by larger groups.

Manual checks of groups derived from FAME

Although use of FAME generates a more comprehensive view of group ownership structures than CQC brands provide, manual checks using documents filed with relevant regulators and other sources show continuing gaps and discrepancies. The provider universe is skewed towards a relatively small number of larger groups. This makes it feasible to perform detailed manual checks on groups that represent a significant percentage of the sector's total capacity. In order to maximise the return on time spent, we check the largest groups in descending order of capacity (number of beds). We perform detailed manual checks on groups of every relevant kind (Consolidated Groups, Non-consolidated Groups and Standalone) whose capacity is at least 500 beds (equivalent to 1.5% of the working sample), as well as on a further 183 groups

each of which comprises fewer than 500 beds, chosen at random. In total, these manual checks cover more than half (55%) of beds in the working sample.

HC-One, which is the largest provider group, illustrates some of the issues our manual checks address. (i) Using FAME, the shared-GUO approach identifies a group of 6 providers that share a GUO called FC Skyfall LP (registered in the Cayman Islands). The second approach in FAME (director overlap) identifies a Non-consolidated Group centered around HC-One and comprising twelve providers. (ii) CQC brand data show that seven of this larger group of twelve providers belong to the CQC's BRAND HC-One, while the remaining five belong to BRAND Pearl Jackson. This means the CQC BRAND HC-One contains fewer providers (six) than the FAME director-overlap approach does (twelve); but more providers than the FAME shared-GUO approach does (seven).

(iii) Manual checks are needed to resolve these discrepancies. The checks show that a single individual serves as a director at all seven providers in the CQC's BRAND HC-One and also at one provider that belongs to the CQC's BRAND Pearl Jackson. Since BRAND Pearl Jackson has five providers, this single director overlap links HC-One and Pearl Jackson, creating a Non-consolidated group containing twelve providers in all (seven HC-One and five Pearl Jackson). Closer inspection shows that the individual in question plays a non-executive role at both groups (HC-One and Pearl Jackson) and therefore has no ownership role at either. In this case the director overlap does not indicate common control in the sense required by our definition of a Non-consolidated Group. We therefore 'break' FAME's indicated connection between BRAND HC-One and BRAND Pearl Jackson. We now need to assess whether the seven providers that CQC groups under BRAND HC-One make up a Consolidated or a Non-consolidated Group. FAME names one GUO for six of the providers (FC Skyfall LP) and a second GUO (FC Oval Bidco Ltd) for the remaining provider. On the face of it, this suggests we should treat HC-One as a Non-consolidated Group. However, further manual checks show that FC Skyfall LP is in fact the ultimate parent of all seven providers, not just six of them. If so, then HC-One may qualify as a Consolidated Group if consolidated accounts are available for the ultimate parent company FC Skyfall LP. FC Skyfall LP is registered in the Cayman Islands and does not file any accounts at Companies House; this points towards Non-consolidated Group status. But further manual checks find that another holding company in the HC-One structure called FC Skyfall Holdco 3 Ltd (also registered in the Cayman Islands) does file consolidated accounts at Companies House. Since FC Skyfall Holdco 3 Ltd's accounts

include all seven of the CQC BRAND HC-One providers, we designate HC-One a Consolidated Group.

Tables A.2 shows how the final level of manual checks affects the group structures derived solely from FAME. The most significant change is the reversal in the relative proportion of beds being operated by consolidated, as opposed to non-consolidated, groups. In the working sample, manual checks increase the proportion of beds being operated by consolidated groups from 29% (based on FAME alone) to 44% (after manual checks). Since financial ratios calculated for consolidated groups are more comprehensive than those for non-consolidated groups, this is a significant positive.

Our overall findings on group ownership structure are consistent with ex-ante expectations. The ownership profile of the English care home sector is almost exclusively unquoted and highly fragmented. It therefore includes a relatively high proportion of groups where common control does not also involve a common corporate owner in the way one would expect to see for larger (especially quoted) companies. Our FAME analysis, supplemented by detailed manual checks, reveals 'hidden groups' that might otherwise not be apparent. Our group typology allocates 73% of beds in our final working sample to larger groups: nearly half as many again as the 50% of beds that belong to CQC brands. Our detailed manual checks also address complications that can arise from foreign ownership.

Appendix 2. Financial ratios

Key definitions. We define 'debt' in FAME as -1 * ("Short Term Loans & Overdrafts" + "Long Term Debt"). We define 'lease expense' in FAME as the item called 'Land & Building or Property Rents & Other'.

Audited / unaudited accounts. The relevant regulators (Companies House, Charity Commission, Financial Conduct Authority) give organisations below a defined size (based on different combinations of turnover, assets and number of employees) the option of filing accounts that have not been audited. Such unaudited accounts may be less reliable than those that have been audited and some previous research has excluded such data.[4]

We calculate financial ratios at the group level rather than that of individual providers. This means the relevant level for considering whether accounts are audited or not is that of groups, rather than providers. For 613 groups of all three varieties (consolidated, non-consolidated,

[4] E.g. Michaely & Roberts (2012).

standalone), comprising nearly 60% of total beds in the working sample, the accounts we use are wholly audited. For 2,004 groups, comprising 31% of total beds, the accounts are wholly unaudited. For 70 non-consolidated groups, comprising nearly 10% of total beds, we calculate ratios based on a mix of audited and unaudited accounts.

The exemption allowing unaudited accounts and the exemption from filing a profit and loss statement both relate to small company size. By definition, therefore, a significant overlap exists between groups with unaudited accounts and groups that file no profit and loss statement. 725 provider groups, comprising 242k beds (71% of the final working sample), file accounts that include a profit and loss statement. A significant majority of these (596 groups comprising 200k beds, or 83% of the profit and loss subset) file accounts that are wholly audited. Our robustness checks (section 5.3 of the paper) found no significant difference between results whether we included or excluded accounts with a profit and loss statement and we believe the same likely applies to audited vs unaudited accounts.

Charities Statement of Recommended Practice (SORP). FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland, which came into effect on 1 January 2019, includes a Charities Statement of Recommended Practice (SORP).[5] Under the SORP, registered charities present a Statement of Financial Activity (SoFA) rather than a profit and loss statement. The SoFA's presentation differs slightly from a conventional Profit & Loss statement but is broadly similar. Registered charities comprise only 263 provider groups comprising 8.6% of beds in the extended sample. See Table 1 – Panel A.

Lease accounting - background. Historically, most sets of accounting standards have distinguished between two types of lease arrangement. A lease classified as a 'capital' or 'finance' lease is treated similarly to debt. The lessee's balance sheet includes a liability for the lease, offset by the asset that the lease is financing; in the profit and loss statement, the cost of servicing the lease liability is treated as a financing cost (that is, like interest expense on conventional debt). By contrast, if a lease is classified as an 'operating lease' then neither a liability nor an asset associated with this contract appears on the balance sheet; and the cost of servicing the lease is treated as an operating cost ('lease rental expense') rather than as a financing cost (that is, it is classified differently from interest expense). This difference in

[5] https://www.gov.uk/government/publications/charities-sorp-2005

treatment applies even when an operating lease has a long duration (for example, 30 years) and is being used to finance a long-term asset such as a care home.

This difference in accounting treatment for different kinds of leasing arrangement creates an inconsistency between the accounts of companies that use operating leases to finance assets and those that do not. Companies that make intensive use of operating leases have balance sheets that appear less highly leveraged than those that use on-balance-sheet forms of financing.

In January 2016 the International Accounting Standards Board issued IFRS 16, 'Leases'.[6] IFRS 16 addresses the discrepancy in treatment of the two different types of lease. IFRS 16 introduces a change by requiring a lessee to recognize assets and liabilities for all leases with a term of more than 12 months, unless the underlying asset is of low value. A lessee is required to recognize a right-of-use asset representing its right to use the underlying leased asset and a lease liability representing its obligation to make lease payments. IFRS 16 became effective for annual reporting periods beginning on or after 1 January 2019. Based on a 12-month reporting period, therefore, any company reporting under IFRS must implement IFRS 16 for financial years ending 31 December 2019 and thereafter.

IFRS does not apply to smaller and unlisted companies in the UK. The prevailing set of accounting standards for these companies is FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland.[7] FRS 102 is based on the International Financial Reporting Standard for Small and Medium-sized Entities (IFRS for SMEs). 'The IFRS for SMEs is intended to apply to the general purpose financial statements of, and other financial reporting by, entities that in many countries are referred to by a variety of terms including 'small and medium-sized', 'private' and 'non-publicly accountable'.' FRS 102 maintains the differential treatment of finance leases (on balance sheet) and operating leases (off balance sheet).

In the US, the Financial Accounting Standards Board (FASB) issued ASU 2016-02 in 2016.[8] This policy's impact is broadly similar to IFRS 16. ASU 2016-02 became effective for fiscal years beginning after 15 December 2018 for certain types of organization including 'public business entities' (effectively, listed companies).

[6] https://www.ifrs.org/issued-standards/list-of-standards/ifrs-16-leases/
[7] https://www.frc.org.uk/getattachment/69f7d814-c806-4ccc-b451-aba50d6e8de2/FRS-102-FRS-applicable-in-the-UK-and-Republic-of-Ireland-(March-2018).pdf
[8] https://www.fasb.org/cs/Satellite?c=Document_C&cid=1176167901255&pagename=FASB%2FDocument_C%2FDocumentPage

Lease accounting – adjustments. We want to measure the financial condition of the care home providers and groups in our sample on the most consistent basis possible. Where accounting for operating leases is concerned, the care home providers and groups fall into two groups.

All but a handful of the companies relevant to this study either are, or are owned by, unlisted UK companies. This makes them subject to FRS 102 and means that IFRS 16 does not apply. Almost all the companies that use operating leases therefore account for them in the traditional way: the liabilities and assets associated with the operating lease contract remain off balance sheet. This creates an inconsistency between the balance sheets of groups that use operating leases and those that do not.

Four groups in the sample are affected by the recent changes in accounting standards. In the UK, while BUPA is not a listed company, it is relatively large and it chose to adopt IFRS 16 in its accounts for the year ending 31 December 2019. The change had the effect of increasing its total assets by about £1bn (+8%), relative to the prior year. Another UK group, Caretech Holdings, is (unlike BUPA) a listed company. But since the Caretech financial accounts used in this study are for the year ending 30 September 2019 it had not yet had to adopt IFRS 16 and the 2019 accounts handle operating leases in the traditional way.

Three listed US companies (Acadia Healthcare, Universal Health Services and Welltower) feature in the study because they are the corporate owners of UK care home provider groups (Priory Group, Cygnet Health Care and a group of providers most of whose names include the word 'Gracewell'). All three US companies adopted ASU 2016 02 in their accounts for the year ending 31 December 2019, which are the accounts used in this study. Adopting the new accounting standard had the effect of increasing the three companies' total assets by 7%, 3% and 2%, respectively.

This study needs to find a way to adjust the balance sheets of companies that use operating leases in a way that (i) is as consistent as possible with the adjustments already made by the four large groups cited (ii) can be implemented across a large sample and (iii) addresses the true long-term economic cost of the assets being financed.

(ii) means it is impossible to reproduce the approach taken by the new accounting standards. The way the new standards generate a capital figure for the balance sheet is by discounting known future operating lease payments at the marginal cost of borrowing. Repeating this exercise across a sample of the size relevant to this study is not practical. The only practical

approach involves applying a multiple to a company's annual operating lease rental expense. The question then becomes: what multiple to apply?

Two data points are readily available. The first data point is the multiples that are implied by the capital figures that the new accounting standards have created on the balance sheets of BUPA, Acadia Healthcare, Universal Health Services and Welltower. These are shown in Table A.3.

The implied multiples lie in a wide range that simply reflects the remaining life of the relevant contracts: shorter remaining lives produce lower implied multiples. But while a short remaining life may generate a lower capital value, the true long-term liability of owning a care home has to reflect long term ownership. The present value of an existing operating lease with a short remaining life may be lower than the present value of the total future payments that will be required to rent a care home indefinitely (based on both the existing lease and subsequent leases).

The second available data point supports this point. Two listed UK REITs called Impact Healthcare (market cap, December 2021: £415 million) and Target Healthcare (market cap: £719 million) build and/or buy care homes that they then rent under operating leases to providers, including many groups that are part of our sample. Impact and Target both publish a statistic called WAULT (Weighted Average Unexpired Lease Term): as of September 2021 these were 19.5 years and 28.8 years, respectively. Impact and Target carry the homes they own at fair value on their balance sheets. They also report the rental income that they receive from their lessees, which equals the lease rental expense that care home providers pay to the REITs. The ratio between these two items (fair value and rental income/expense) is arguably the most accurate measure of the relationship between lease rental expense and the long-term capital value of the liabilities and assets involved.

As shown in Table A.4, calculations based on Impact and Healthcare REITS suggest a multiple of around 13 times. This also seems broadly consistent (when adjusted for length of lease) with the implied multiples for the four companies that have adopted new accounting standards. We therefore apply a multiple of 13 times to lease rental expense on land, buildings and property.

Appendix 4. Ownership types

Standalone providers. By definition, the ownership type of a standalone provider is the provider's ownership type.

Consolidated Groups. The ownership type of a Consolidated Group's parent may differ from the ownership type of some or all of the individual providers within the group. A non-profit parent can gain additional operating and financial flexibility, while preserving its non-profit status, by giving individual subsidiaries a conventional for-profit legal structure. In a small number of large Consolidated Groups (the largest being BUPA, which operates 6,827 beds or 1.8% of the extended sample), the parent company is non-profit while at least some subsidiaries (nursing home providers) have for-profit legal formats. In this situation, we define the group's ownership type as that of the parent company.

Non-consolidated Groups. Almost all non-consolidated provider groups (476 out of 478 in the final working sample) consist solely of for-profit companies. The overall group's ownership type is therefore either PE, Family or Other and we classify them in the usual way. Two non-consolidated groups which contain providers of different ownership types (Cahal Grant and Shaw healthcare Group) are anomalies for different reasons. They comprise 0.05% and 0.5%, respectively, of beds in the extended sample and in each case we have made a judgement based on available information.

Table A.1. Relationship between FAME variables and three provider group categories

	Accounts type	
Common ownership/control	'Group' accounts	Other accounts types
Neither	Consolidated groups	Standalones
GUO-shared	Consolidated groups	Non-Consolidated groups
Director overlaps	n/a	Non-Consolidated groups

Table A.2. FAME data / CQC brands / manual checks: number of Groups and Providers

Panel A: In number of groups and providers

	FAME data				With manual checks			
Number of	Groups	Providers			Groups	Providers		
		Total	No CQC brand	CQC brand		Total	No CQC brand	CQC brand
Extended Sample								
Standalone providers	2,860	2,860	2,796	64	2,839	2,839	2,800	39
Consolidated groups	261	681	357	324	276	758	313	445
Non-consolidated groups	600	1,595	1,121	474	479	1,539	1,161	378
Total	3,721	5,136	4,274	862	3,594	5,136	4,274	862
Working Sample								
Standalone providers	1,959	1,959	1,909	50	1,936	1,936	1,912	24
Consolidated groups	257	676	353	323	273	754	309	445
Non-consolidated groups	598	1,588	1,114	474	478	1,533	1,155	378
Total	2,814	4,223	3,376	847	2,687	4,223	3,376	847

Panel B: In fraction of beds

	FAME approach			With manual checks		
	Total	No CQC brand	CQC brand	Total	No CQC brand	CQC brand
Extended Sample						
Standalone providers	35%	30%	5%	33%	30%	3%
Consolidated groups	26%	9%	18%	40%	8%	32%
Non-consolidated groups	39%	14%	24%	27%	15%	12%
Total	100%	53%	47%	100%	53%	47%
Working Sample						
Standalone providers	29%	25%	4%	27%	25%	2%
Consolidated groups	29%	9%	19%	44%	9%	35%
Non-consolidated groups	42%	16%	27%	30%	16%	13%
Total	100%	50%	50%	100%	50%	50%

Table A.3. Multiple of rent implied by new lease accounting standards

Implied multiple is computed as right of use asset divided by lease payments. Unlike ASU 2016-2, IFRS 16 does not require the disclosure of the remaining life of the leases in question, and that is why it is missing for BUPA.

	Remaining life of operating leases (years)	Implied multiple
BUPA	N.A.	18.4x
Acadia	19.4	8.2x
Universal Healthcare Services	9.7	4.5x
Welltower	46	13.6x

Table A.4. Multiple of rent implied by two UK healthcare REITs

	Dec 2018	Dec 2019
Impact Healthcare	12.7x	12.9x
Target Healthcare	12.8x	13.7x

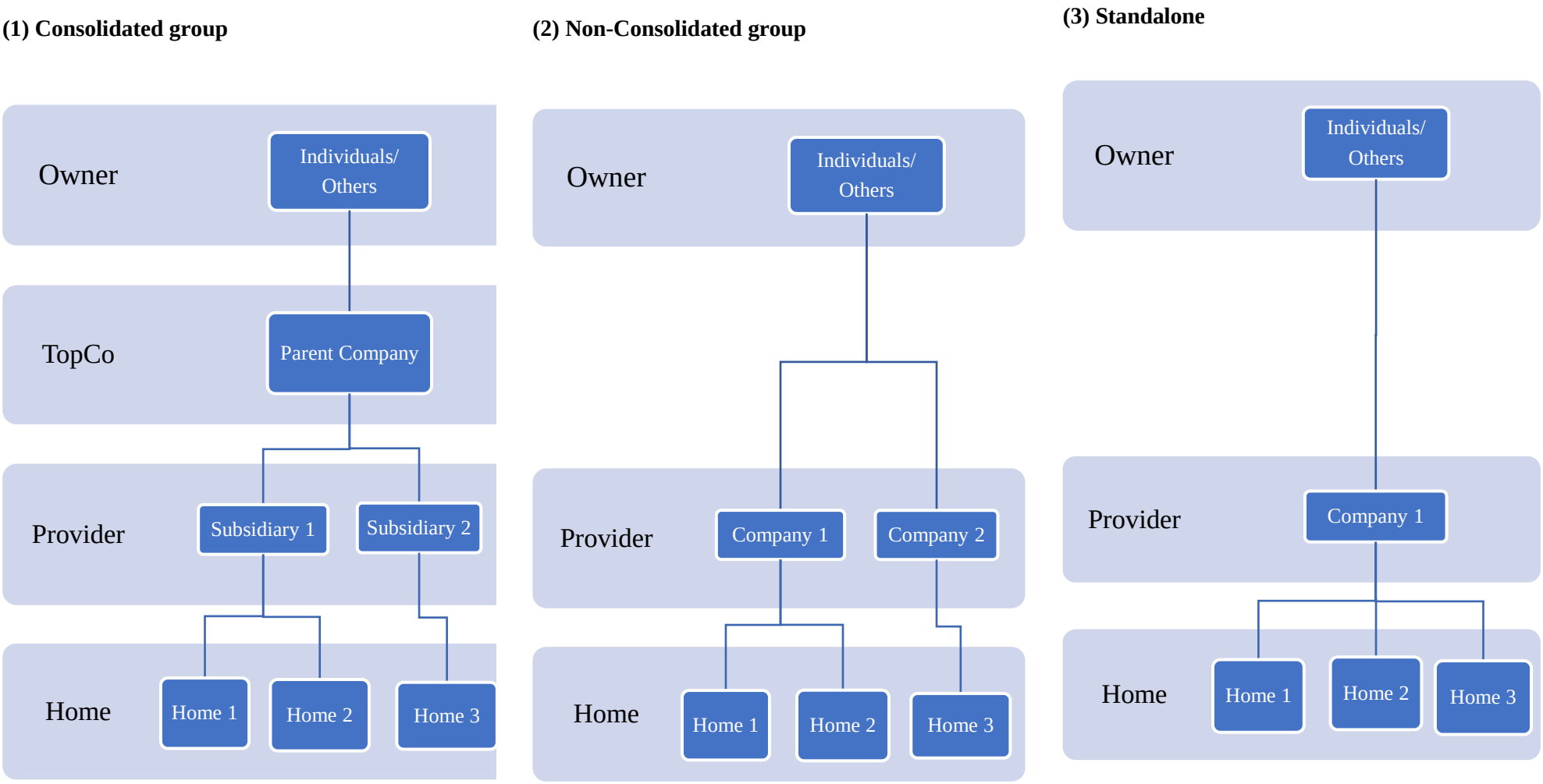
Table A.5. Largest groups

Rank	Group name	# beds	# homes	# providers	Ownership type	Structure type
1	HC-One	15,673	258	7	PE	Consolidated Group
2	Barchester	12,570	198	23	Other	Consolidated Group
3	Four Seasons	7,961	144	36	PE	Consolidated Group
4	Care UK	7,213	106	4	PE	Consolidated Group
5	BUPA	6,827	116	15	RS/CLG	Consolidated Group
6	Anchor Trust	5,769	112	2	RS/CLG	Consolidated Group
7	Sunrise	4,561	51	10	Other	Non-Consolidated Group
8	Methodist Homes	4,483	84	1	Charity	Consolidated Group
9	Maria Mallaband	4,441	75	24	Other	Non-Consolidated Group
10	Sanctuary Care	4,340	81	9	RS/CLG	Consolidated Group

Table A.6. Largest PE-controlled groups

	Name	TopCo	PE Sponsor	Providers	Beds	Homes	Death Rate (Whole period)
1	Oakland Primecare	Gibson Topco	Synova	2	212	3	16.04%
2	Sonnet	Sonnet Care Homes Holdco	August Equity	1	183	2	14.75%
3	Care UK	Care UK Holdings	Bridgepoint	4	7,213	106	13.77%
4	Akari	Project Light Topco	Carlyle	1	1,656	30	12.68%
5	Ideal Care	Ideal Carehomes Topco	Warwick Capital Partners	2	1,008	17	12.00%
6	Orchard Care	Cortina Race	Alchemy	3	1,458	26	11.52%
7	HC-One	FC Skyfall Holdco	Safanad; Formation Capital	7	15,673	258	9.95%
8	Four Seasons	Elli Investments	H/2 Capital Partners	36	7,961	144	8.65%
9	Exemplar	Cx Holdco	Agilitas	18	605	18	7.77%
10	Hamberley	Na	Patron Capital	2	329	5	5.78%
11	Elysium	Elysium Healthcare Holdings	BC Partners	3	223	3	4.48%
12	Galaxy	Galaxy Group Midco	AMP Capital	2	57	2	3.51%
13	Voyage	Voyage Care Holdco	Duke Street; Tikehau; Partners Group	1	101	7	1.98%
14	Swanton	Sunshine Care Topco	Apposite Capital	1	49	1	0.00%
15	Accomplish Group	Accomplish Group Holdco	G Square Capital	1	14	1	0.00%

Figure A.1. Schematic Diagram Group Types



Note that: 1. The TopCo in a consolidated group may itself be a provider that files consolidated accounts; and 2. A standalone can be a group consisting of a single provider that does not itself file consolidated accounts. See the Appendix for detailed information about how groups are formed/classified.