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Relationship between the Ownership Status of Nursing Homes and Their Outcomes During the COVID-19 Pandemic: A Rapid Literature Review

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Context: Some nursing homes fared better than others to protect themselves against the 2019 coronavirus disease (COVID-19). Organisational characteristics may mediate the effect of the COVID-19 pandemic. Previous reviews have suggested for-profit providers provide worse quality of care. Does ownership also matter in the response to the COVID-19 pandemic?

Objective: The aim of this literature review is to evaluate the relationship between ownership structure of nursing homes and their performance during the pandemic, measured as COVID-19 cases and deaths.

Method: A rapid literature review was conducted in PubMed and Web of Science, following a systematic approach. The search was conducted in October 2020 and updated in December 2020. Articles were selected based on a pre-defined set of PICOT criteria and underwent risk of bias assessment.

Findings: Eighteen papers were included in this rapid review. These papers cover a period from March to July 2020. The majority of papers found a significant relationship in the unadjusted statistics between ownership status and effectiveness in response to the COVID-19 pandemic. However, the adjusted figures paint a more nuanced picture. The relationship seems to be mediated by other organisational (e.g., size), process (e.g., staff shortages) and contextual factors (e.g., regional spread of COVID-19) in comparison to ownership directly.

Limitations: The majority of the included studies focus on North America, and most studies are of low to medium quality with respect to research methodology.

Implications: In the short-term, it will likely be more effective to address identified mediating factors of the relationship between ownership and COVID-19 outcomes; but for the long-term, this review is in keeping with previous literature suggesting policymakers should be cautious about encouraging the ownership of nursing homes by for-profit providers.

Keywords: ownership; for-profit; nursing homes; long-term care facilities; COVID-19 pandemic; coronavirus

Background

The coronavirus disease 2019 (COVID-19) pandemic has exposed several cracks in our healthcare, social care and long-term care systems. The nursing home sector, in particular, has been disproportionally affected by the COVID-19 virus (Comas-Herrera & Zalakain, 2020). In a study of 22 countries, an alarming 41% of their COVID-19 related deaths occurred in nursing homes, while only, on average, 0.7% of the total population live in nursing homes (Comas-Herrera et al., 2021). Nursing home residents are typically frail older adults often characterised as living with multiple chronic diseases and functional impairments, making them more susceptible to severe complications and mortality as a result of a COVID-19 infection (Barnett &...
Grabowski, 2020; Comas-Herrera & Zalakain, 2020). While the age and frailty of individuals living in nursing homes play a significant role in characterising their increased risk of dying from COVID-19, other nursing home characteristics have also been found to complicate the prevention and spread of infections (Lansbury et al., 2017; McMichael et al., 2020). Nursing homes represent congregate living facilities, whose residents and staff may experience additional challenges adhering to appropriate physical distancing measures or limiting the transmission of infections from visitors and staff. The outcomes of responses to effective prevention and management of COVID-19 outbreaks in nursing homes therefore depends on a variety of factors: infection prevention and control protocols, adequate staffing and training, access to personal protective equipment (PPE) and adequate testing capacity, and the rates of regional spread of COVID-19 (Huhtinen et al., 2019). Some of these factors are beyond the control of the nursing homes (e.g. rates of regional spread of COVID-19); but other factors are under remit of the nursing home itself.

It can be difficult, however, to understand what primarily drives the variation between nursing homes with regards to how they have responded to the pandemic. One hypothesis relates to the organisational characteristics of the nursing homes. Previous literature has looked at the role of ownership types and their relationship with the performance of nursing homes. Systematic reviews have previously reported that for-profit providers provide worse quality of care (Bos et al., 2017; Comondore et al., 2009; Hillmer et al., 2005), achieve worse employee satisfaction rates (Bos et al., 2017), but offer better outcomes with regard to cost-efficiency (Bos et al., 2017) compared to non-profit and publicly-owned care homes. The question is whether this relationship has prevailed during the COVID-19 pandemic.

In recent decades, various countries have introduced market-based principles to control growing long-term care (LTC) expenditures (Harrington et al., 2017; Meagher & Szebehely, 2013); this in itself is underpinned in the neo-liberal and New Public Management paradigms (Maarse, 2006). These paradigms promote values such as individualism, free market principles and austerity via privatisation, and decentralisation (McGregor, 2001). Nursing homes owned by for-profit providers have as a result gained significant market share of the LTC sector in many countries (Eurofound, 2017; Hawes & Phillips, 1986; Meagher & Szebehely, 2013); although resulting ownership rates by for-profit providers appear to differ significantly between countries (Eurofound, 2017; Meagher & Szebehely, 2013). For example, the nursing home market in the United Kingdom is largely dominated by for-profit nursing homes (82%) (Competition & Markets Authority [CMA], 2017), whereas the majority of Dutch nursing homes are owned by non-profit providers (88%) (Bos et al., 2020).

In this study, the ownership of nursing homes is categorised as belonging to for-profit, non-profit, or public providers. For-profit providers are defined as organisations that operate with the objective of generating profits; the for-profit entity therefore owns these generated profits. Non-profit providers are expected to serve a social purpose, and these kinds of organisations are prohibited from distributing their profits to other entities (Anheier & Ben-Ner, 2003; Hansmann, 1980). Public organisations are owned and controlled by (a part of) the government and funded primarily via public taxation (Frumkin & Galaskiewicz, 2004). The distinction between ownership types appears to be clearly defined, but in reality, the boundaries are somewhat blurred (DiMaggio & Powell, 1983).

The relationship between ownership type and performance of healthcare providers has been studied for a long time (Herrera et al., 2014; Hirth, 1997; Kruse et al., 2018). It is hypothesised that the inherent motives vary between these different ownership models, which may lead to differences in outcomes and quality. A key difference between ownership structures is differentiating who possesses ultimate control over the governance of a nursing home: owners in for-profit institutions versus boards of trustees in the non-profit institutions (Gray, 1986; Hansmann, 1980). The profit motive may drive organisations to operate more efficiently and respond to the wishes of clients in order to secure their revenue, which may mean they compete on price and quality of care (Brealey et al., 2019). This may compete with achieving more favourable financial returns, possibly devaluing resident and employee wellbeing in deference to profits (Bos et al., 2017). During the pandemic, these previously documented mechanisms to minimise expenditures and maximise profits may translate into potentially worse outcomes; for example, lower staff full-time employment opportunities may result in staff working multiple jobs facilitating spread of the virus or minimal equipment stores may result in reduced infection control equipment for residents or staff.

This paper builds on existing ownership literature and examines whether previous findings remain consistent in the face of a new exogenous shock (the pandemic). Said in another way, the question is whether these performance differences have influenced COVID-19 related outcomes during this pandemic with the implications to direct current pandemic relief efforts. This is addressed through a rapid literature review to explore the relationship between ownership of nursing homes and their performance in the COVID-19 crisis, comparing for-profit homes on the one hand with private non-profit and public nursing homes on the other.

Methods

A rapid literature review of primary studies was conducted to identify relevant articles on the relationship between ownership types of nursing homes and their outcomes during the COVID-19 pandemic. Rapid reviews follow a systematic review methodology but in a streamlined manner (in this paper, we limited the number of databases searched and had a single author extract data, which was audited by a second author) to facilitate timelier conduct of the review (Tricco et al., 2015). Furthermore, this method of review has been shown to be valuable to inform timely decision-making processes.

The exact definition and phrasing of the term “nursing home” differs worldwide. There are several equivalents to the term nursing home, such as LTC home, residential facility, or care home. Sanford et al. propose a general definition of the term nursing home which reads as follows: “a
facility with a domestic-styled environment that provides 24-hour functional support and care for persons who require assistance with [activities of daily living] and who often have complex health needs and increased vulnerability" (Sanford et al., 2015, p.183).

The Population, Intervention, Comparators, Outcome, and Timeframe (PICOT) question's defining elements that were used as the basis of this study's rapid literature review are further specified in Table 1. Primary studies were eligible for inclusion if: they examined a nursing home population during the COVID-19 pandemic and compared for-profit ownership to either non-profit or public, or both. We include outcomes that reflect the effectiveness in response to the pandemic in terms of Donabedian's outcomes (Donabedian, 1966). Hence, we include outcomes such as excess mortality or whether there is at least one COVID-19 confirmed case or death among residents or staff members (we did not limit the search based on a predefined list of outcomes as we interpreted the outcome variable broadly). We only included articles that were published in English. All types of studies were included in our search strategy.

Data sources and search strategy
The search was initially conducted in October 2020 (8 months into the WHO-declared COVID-19 pandemic) and updated in December 2020. Two different health research databases were consulted to search for relevant articles: PubMed and Web of Science. The specific search strings for each database can be found in the Appendix, Table A1. In addition, as part of our methodology we selected studies from systematic reviews that analysed the relationship between organisational characteristics and COVID-19 outcomes to ensure a comprehensive overview in case our search overlooked some relevant studies. EndNote X9 and Microsoft Office Excel 2016 were used for data management and analysis.

Study selection procedure
The selected articles were screened for duplicates and year of publication. Publications were only included if published during the pandemic (March 2020 onwards) and written in English. We only included peer-reviewed published research articles. Articles were primarily screened based on title and abstract and subsequently the full-text reviews were conducted based on perceived relevance by two of the authors. Conflicts in screening and eligibility were resolved by consensus. Initially, we identified 11 articles via our search that were consistent with this study's PICOT criteria. We also included 7 additional articles from the literature review of the National Collaborating Centre for Methods and Tools (NCCMT) (we only found this literature review between September 2020 and December 2020). These articles also met this study's PICOT criteria (National Collaborating Centre for Methods and Tools, 2020). The flow chart of this study's literature review and selection process, in accordance with the PRISMA guidelines, is shown in Figure 1 (Moher et al., 2009).

Data extraction and synthesis
A data extraction sheet was created using Microsoft Excel, in which all relevant data (e.g., study characteristics, country of study, characteristics and numbers of nursing homes, study methodology, levels of ownership, unadjusted and adjusted results, and outcomes per ownership status including co-variables) from the selected articles were collected and summarised. Most outcome measures were described as percentages, odds ratios, or relative risks. The data extraction was first performed by a single reviewer using a piloted form, after which a second reviewer checked for correctness and completeness of the extracted data.

Due to the heterogeneity of the review contexts (different nursing home systems, different indicators of ownership, different co-variables, etc.), a meta-analytic approach was not appropriate for the synthesis of results found in this review. Therefore, we present the data as a narrative synthesis. The narrative review is complemented with visualisation of the results as a harvest plot using vote counting based on direction of effect and significance level (Crowther et al., 2011; Mah et al., 2021).

Risk of bias assessment
A quality and risk of bias assessment was performed. For this evaluation, a tool was used that was created based on multiple other validated quality assessment tools (Bero et al., 1998; de Vet, 2003; Glasgow et al., 1999; GRADE Working Group, 2004; Harbour & Miller, 2001; Peersman et al., 1997; Reeves et al., 2011; Sterne et al., 2014; Walker et al., 2012; West et al., 2002), building upon the work of Stadhouders et al. (Stadhouders et al., 2019). Several domains were reviewed: content validity, selection bias, confounding bias, measurement bias, and reliability. See Appendix, Table A2 for the risk of bias tool. Two reviewers independently performed the risk of bias assessment. A four-item response scale was constructed because a "high, average, low" scale was deemed too limited for this review, as most studies were at average risk of bias. However, the quality of the studies still significantly differed from each other within that category. These differences were worth

| Table 1: Description of the inclusion criteria: Population, Intervention, Comparators, Outcome and Timeframe. |
|---------------------------------------------------|----------------------------------------------------------|
| Population                                       | Nursing homes                                           |
| Interventions                                    | For-profit ownership type                               |
| Comparators                                      | Other ownership type (private non-profit, public)       |
| Outcomes                                         | Effectiveness in response to the pandemic (i.e., COVID-19 cases and deaths among residents or staff) |
| Time                                              | During the COVID-19 pandemic                            |
highlighting. Based on the assessment within the several domains the two reviewers collaboratively defined the overall global risk of bias scores.

**Results**

Eighteen papers were included in this rapid literature review (see Table 2). These studies present findings on the relationship between nursing home ownership type and their outcomes during the COVID-19 pandemic, either as a primary focus or as a control variable.

Most studies were situated in the United States (US) (Abrams et al., 2020; Bowblis & Applebaum, 2020; Braun et al., 2020; Bui et al., 2020; Chatterjee et al., 2020; Dean et al., 2020; Gorges & Konetzka, 2020; Harrington et al., 2020; He et al., 2020; Li et al., 2020a; Li et al., 2020c; Sugg et al., 2020; Unruh et al., 2020; Xu et al., 2020). Three studies were from Canada (Brown et al., 2020; Fisman et al., 2020; Stall et al., 2020), all focused on the province of Ontario (Stall et al., 2020; Fisman et al., 2020). One study originated from France (Rolland et al., 2020). In our rapid literature review we found that the articles roughly follow two approaches to reporting outcomes: (i) the binary variable of having at least one case of infection or death, or (ii) the size of the outbreak.

The overall global risk of bias assessment showed a great level of variation between the studies. None of the included studies received a high-quality assessment. Because this review was conducted in the midst of the COVID-19 pandemic, it was expected that all the included studies would be observational cross-sectional studies; this was found to be true, which is understandable in order to study this pandemic in a timely fashion. The study sample sizes ranged from 123 nursing homes (Bui et al., 2020) to 13,709 nursing homes (Sugg et al., 2020). Table A3 in the Appendix shows the evaluation of the risk of bias per study, in which each component was scored on a 4-point scale.
Table 2. Brief version of the summary of findings table (full version in Table A3).

<table>
<thead>
<tr>
<th>Authors</th>
<th>Outcome measure</th>
<th>Region, Country</th>
<th>Unadjusted (descriptive) statistics – for-profit NHs compared to non-profit and/or public</th>
<th>Adjusted statistics – for-profit NHs compared to non-profit and/or public (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Abrams et al. (Abrams et al., 2020)</td>
<td>(i) Having at least one COVID-19 case among residents; (ii) Number of cases among residents</td>
<td>United States</td>
<td>(i) Higher share</td>
<td>(i) No significant relationship</td>
</tr>
<tr>
<td>(2) Bowblis &amp; Applebaum (Bowblis &amp; Applebaum, 2020)</td>
<td>(i) Having at least one COVID-19 case among residents; (ii) Having a high number of COVID-19 cases (greater than 20% of the number of licensed beds)</td>
<td>Ohio, United States</td>
<td>(i) Higher share</td>
<td>(ii) Higher likelihood</td>
</tr>
<tr>
<td>(3) Braun et al. (Braun et al., 2020)</td>
<td>(i) Number of COVID-19 cases and deaths among residents; (ii) Deaths by any cause per 1000 residents; (iii) Shortage 1-week supply of PPE (multiple measures).</td>
<td>United States</td>
<td>(i) Higher share (ii) Higher share (iii) Lower share and no significant difference</td>
<td>(i) Higher likelihood (compared to public not non-profits) (ii) Not significantly different (iii) Mixed. For some measures lower likelihood</td>
</tr>
<tr>
<td>(4) Brown et al. (Brown et al., 2020)</td>
<td>(i) Having at least one COVID-19 case; (ii) Number of cases among residents; (iii) Number of deaths among residents.</td>
<td>Ontario, Canada</td>
<td>(i) No significant difference (ii) Higher share (iii) Higher share</td>
<td>(i) No significant difference (ii) Higher share (iii) Higher share</td>
</tr>
<tr>
<td>(5) Bui et al. (Bui et al., 2020)</td>
<td>Covid-19 outbreaks (two or more cases within 14 days)</td>
<td>West Virginia, United States</td>
<td>No significant difference</td>
<td>n/p</td>
</tr>
<tr>
<td>(6) Chatterjee et al. (Chatterjee et al., 2020)</td>
<td>Having at least one COVID-19 case</td>
<td>20 states in the United States</td>
<td>n/s</td>
<td>n/p</td>
</tr>
<tr>
<td>(7) Dean, Venkataaramani &amp; Kimmel (Dean et al., 2020)</td>
<td>Number of COVID-19 related deaths</td>
<td>New York, United States</td>
<td>Higher share</td>
<td>Not significantly different</td>
</tr>
<tr>
<td>(8) Fisman et al. (Fisman et al., 2020)</td>
<td>COVID-19 mortality rates among residents</td>
<td>Ontario, Canada</td>
<td>No significant difference</td>
<td>n/p</td>
</tr>
<tr>
<td>(9) Gorges &amp; Konetzka (Gorges &amp; Konetzka, 2020)</td>
<td>(i) Having at least one COVID-19 case; (ii) Outbreak: 10% confirmed cases/beds or 20% confirmed and suspected cases/beds or 10+ deaths; (iii) Number of COVID-19 deaths.</td>
<td>United States</td>
<td>(i) Lower share (ii) Higher share (iii) Not provided</td>
<td>(i) Lower likelihood (ii) Higher likelihood (iii) Higher likelihood</td>
</tr>
<tr>
<td>(10) Harrington et al. (Harrington et al., 2020)</td>
<td>Having at least one COVID-19 case among residents</td>
<td>California, United States</td>
<td>Higher share</td>
<td>Not significantly different</td>
</tr>
<tr>
<td>(11) He, Li &amp; Fang (He et al., 2020)</td>
<td>(i) Number of COVID-19 cases among residents; (ii) Number of COVID-19 deaths among residents.</td>
<td>California, United States</td>
<td>All outcomes: Higher share</td>
<td>Not significantly different</td>
</tr>
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<td>Unadjusted (descriptive) statistics – for-profit NHs compared to non-profit and/or public (95% confidence interval)</td>
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<tr>
<td>(12) Li, Cen, Cai &amp; Temkin-Greener (Li et al., 2020a)</td>
<td>(i) Having at least one case among residents; (ii) Number of COVID-19 cases among residents; (iii) Having at least one death among residents; (iv) Number of deaths among residents; (v) Having at least one case among staff.</td>
<td>United States</td>
<td>n/p</td>
<td>(i) Higher likelihood (compared to public not non-profits) (ii; iii; iv; v) Not significantly different</td>
</tr>
<tr>
<td>(13) Li, Temkin-Greener, Shan &amp; Cai (Li et al., 2020c)</td>
<td>(i) Having at least one case among residents; (ii) Number of COVID-19 cases among residents; (iii) Having at least one death among residents; (iv) Number of deaths among residents.</td>
<td>Connecticut, United States</td>
<td>n/s</td>
<td>(i) No significant difference (ii) Higher likelihood (iii) No significant difference (iv) No significant difference</td>
</tr>
<tr>
<td>(14) Rolland et al. (Rolland et al., 2020)</td>
<td>Having at least one COVID-19 infection among resident or caregiver</td>
<td>Haute-Garonne, Occitania, France</td>
<td>Higher share</td>
<td>Higher likelihood</td>
</tr>
<tr>
<td>(15) Stall et al. (Stall et al., 2020)</td>
<td>(i) Having at least one COVID-19 case; (ii) Number of COVID-19 cases; (iii) Number of COVID-19 related deaths.</td>
<td>Ontario, Canada</td>
<td>(i) No significant difference (ii) Higher share (iii) Higher share</td>
<td>All measurements: No significant difference</td>
</tr>
<tr>
<td>(16) Sugg et al. (Sugg et al., 2020)</td>
<td>Number of COVID-19 cases among residents and staff</td>
<td>United States</td>
<td>c/d</td>
<td>Not significantly different</td>
</tr>
<tr>
<td>(17) Unruh et al. (Unruh et al., 2020)</td>
<td>Occurrence of 6 or more COVID-19 deaths</td>
<td>Connecticut, New Jersey, and New York – United States</td>
<td>n/p</td>
<td>Higher likelihood (although mixed picture across states)</td>
</tr>
<tr>
<td>(18) Xu, Intrator &amp; Bowblis (Xu et al., 2020)</td>
<td>Staff with &amp; without COVID-19</td>
<td>United States</td>
<td>Mixed (Higher share compared to public, lower share compared to non-profit)</td>
<td>n/p</td>
</tr>
</tbody>
</table>

n/s No significant test performed.  
n/p Not provided.  
c/d Cannot be distinguished.
Eight studies reported that, according to their unadjusted statistics, for-profit providers were more likely to have at least one COVID-19 case (Abrams et al., 2020; Harrington et al., 2020; Rolland et al., 2020; Xu et al., 2020), at least one COVID-19 death (Dean et al., 2020), an outbreak of COVID-19 cases (defined as number of cases >1 per nursing home) (He et al., 2020), or an outbreak of COVID-19 deaths (defined as number of deaths >1 per nursing home) (He et al., 2020). Four studies show mixed performance results (Braun et al., 2020; Gorges & Konetzka, 2020; Stall et al., 2020; Xu et al., 2020). Two studies did not find a significant relationship between ownership types when using unadjusted statistics (Bui et al., 2020; Fisman et al., 2020). These two studies were situated in West Virginia (US) and Ontario (Canada) and both used a regional dataset. The remaining studies did not report unadjusted figures (Bowblis & Applebaum, 2020; Brown et al., 2020; Li et al., 2020a, 2020b, 2020c). These studies did not perform a significance test (Chatterjee et al., 2020; Li et al., 2020c), or classified ownership into too many categories that transcended for-profit, non-profit and public ownership structures (Sugg et al., 2020).

The adjusted figures paint a slightly different picture than the unadjusted figures. Four studies showed that the significant relationship disappeared as soon as the figures were adjusted for a number of co-variables discussed in the next section (Dean et al., 2020; Harrington et al., 2020; Stall et al., 2020; He et al., 2020). Only one study found a robust relationship (Rolland et al., 2020), while other studies show a more mixed set of outcomes (Abrams et al., 2020; Braun et al., 2020; Brown et al., 2020; Gorges & Konetzka, 2020; Li et al., 2020a, 2020b, 2020c; Unruh et al., 2020).

Of the nine studies analysing whether – keeping other covariates constant – for-profit homes were more likely to have at least one case among residents, only three studies found such a relationship (Braun et al., 2020; Li et al., 2020a, 2020b; Rolland et al., 2020). One study found the opposite (Gorges & Konetzka, 2020). The other studies did not find a significant relationship (Abrams et al., 2020; Bowblis & Applebaum, 2020; Brown et al., 2020; Harrington et al., 2020; Li et al., 2020a, 2020b; Stall et al., 2020). Unruh et al. analysed the occurrence of six or more COVID-19 deaths (Unruh et al., 2020). They found that, for all nursing homes combined from Connecticut, New Jersey, and New York, for-profit nursing homes were significantly more likely to have six or more COVID-19 deaths compared to their non-profit or publicly-owned counterparts (Unruh et al., 2020). However, statistics per state present a more mixed picture: the significant relationship disappeared for for-profit homes in New York and Connecticut (Unruh et al., 2020).

Three studies found that the adjusted number of COVID-19 cases and deaths among residents was higher in for-profit homes (Abrams et al., 2020; Gorges & Konetzka, 2020; Brown et al., 2020). Five studies found no such relationship (Dean et al., 2020; He et al., 2020; Li et al., 2020a, 2020b, 2020c; Unruh et al., 2020). Unruh et al. analysed the occurrence of six or more COVID-19 deaths (Unruh et al., 2020). They found that, for all nursing homes combined from Connecticut, New Jersey, and New York, for-profit nursing homes were significantly more likely to have six or more COVID-19 deaths compared to their non-profit or publicly-owned counterparts (Unruh et al., 2020). However, statistics per state present a more mixed picture: the significant relationship disappeared for for-profit homes in New York and Connecticut (Unruh et al., 2020).

**Figure 2** provides an overview of both the unadjusted and adjusted statistics by means of a harvest plot. In **Figure 2**, the selected outcomes are labelled on the left. Each box represents one study. The number in the box corresponds to the study numbers outlined in **Table 2**.
Mediating factors
Several factors could have mediated the relationship between ownership types of nursing homes and their outcomes during the COVID-19 pandemic. After adjusting for these factors, the relationship between profit nursing homes and COVID-19 cases, outbreaks, and mortality disappeared in the majority of the studies. This review identified three categories of mediating factors: organisational, process, and contextual (Figure 3). Due to the observational study designs and types of statistical analyses of the studies in this review, it is difficult to pinpoint which mediating factors were driving the change in association between ownership types and COVID-19 outcomes. However, these factors have to be considered to enhance our understanding of the association between ownership type and COVID-19-related outcomes. Table A4 in the appendices provides a list of relevant co-variables explored by each of the studies in this rapid literature review.

Organisational mediating factors
We identified five organisational factors, related to the institutional attributes or conditions within nursing homes, that appeared to influence the relationship between ownership and COVID-19-related outcomes. Firstly, larger nursing homes (the number of residents or beds in one location) were more likely to have a COVID case compared to smaller-sized nursing homes (Abrams et al., 2020; Harrington et al., 2020; He et al., 2020). One study, however, did not find a relationship (Brown et al., 2020). Two studies suggested that the probability of having an outbreak was higher among smaller nursing home locations (Abrams et al., 2020; Li et al., 2020c). They argued that while smaller homes were less likely to have outbreaks, outbreaks in small homes affected relatively more residents (Abrams et al., 2020). Secondly, some studies found that chain-affiliated entities were associated with worse COVID-19 outcomes (Dean et al., 2020; Li et al., 2020c). In contrast, according to one study, sole proprietorship homes were found to have a higher probability of having a COVID-19 case than chain-affiliated homes (Abrams et al., 2020). Thirdly, outdated design standards (defined as structural age of the home’s design, dichotomised to pre- and post-year of regional design reforms) were an important identified risk factor for transmission of COVID-19 after an outbreak has occurred (Stall et al., 2020). Outdated design standards were found to often occur in profit nursing home settings (Stall et al., 2020). Fourth, and connected to the former, higher crowding (measured using an index or relative to available space) was associated with higher risk of outbreaks (Brown et al., 2020; Stall et al., 2020). Lastly, several studies in this rapid literature review showed that case-mix (e.g., comorbidities and age) and socioeconomic status were important to account for in the relationship between ownership and their response to the pandemic. A more complex case-mix was found to increase the risk of mortality (Sanyaolu et al., 2020) and the likelihood of having more residents from a lower socioeconomic status increased the likelihood of having one or more cases of COVID-19 infections (Harrington et al., 2020; Li et al., 2020c). For-profit nursing homes were also associated

![Figure 3: Mechanisms underlying how nursing home ownership types and associated mediating factors influences COVID-19-related outcomes.](image-url)
with more health deficiencies (violations of health-related nursing home regulations) compared with non-profit and publicly-owned facilities (Harrington et al., 2020).

**Process mediating factors**
Process mediating factors, the factors that were identified as impacting the execution of infection prevention and control, included staffing ratios, access to PPE and appropriate testing capacity. Staffing shortages were found to increase the likelihood of having worse COVID-19 outcomes (Gorges & Konetzka, 2020; Harrington et al., 2020). Two studies in our systemic review painted a mixed picture as to whether for-profit nursing homes are more likely to have staff shortages (Braun et al., 2020; Xu et al., 2020). Another important process mediating factor was availability of, or access to, PPE. Having enough PPE was associated with limiting the risk of COVID-19 contraction and transmission in nursing homes (Fisman et al., 2020; Gorges & Konetzka, 2020). One study measured shortages of one-week supplies of PPE and showed mixed results; PPE supply in for-profit compared to non-profit homes depended on the type of PPE (i.e., masks, gowns, eye protection, etc.) (Braun et al., 2020). Lastly, access to appropriate testing capacity, while not measured, was mentioned by one study as being available earlier to private for-profit than publicly-owned homes (Rolland et al., 2020).

**Contextual factors**
The location of the nursing home was also found to be related to COVID-19 cases (Abrams et al., 2020; Sugg et al., 2020). Most importantly, high community rates of COVID-19 transmission also were found to significantly increase the risks of COVID-19 outbreaks in local nursing homes (Stall et al., 2020; Sugg et al., 2020). It remains unclear whether for-profit nursing homes are randomly spread across the regions and whether this may explain certain outcomes. Other contextual factors that were examined included: surrounding population size, urban versus rural location, and degree of competitiveness in the nursing home market.

**Discussion**
The aim of this rapid literature review was to synthesize the literature about the relationship between ownership of nursing homes and their performance in the COVID-19 crisis, comparing for-profit homes on the one hand with private non-profit and public nursing homes on the other. Our findings suggest that ownership matters, at least at first sight. However, this relationship appears to be much more complex and nuanced. As such, a substantial share of this relationship was determined to be due to underlying (mediating) factors. Three categories of mediating factors were identified through this rapid literature review: organisational (such as size, chain affiliation, or design standards), process (appropriate staffing and access to PPE and testing), and contextual factors. After controlling for these relevant co-variables, a large proportion of the studies showed that the relationship between ownership status and COVID-19 pandemic-related outcomes disappeared, attenuated, or provided a mixed picture. Given that the relationship between for-profit ownership status changed after correcting for other mediating factors, this raised the question as to whether it is the for-profit status or the underlying characteristics of for-profit nursing homes that is responsible for specific COVID-19 pandemic-related outcomes.

Nonetheless, it is also possible that these mediating (organisational, process, and contextual) factors are associated with ownership status of nursing homes. Firstly, with respect to mediating organisational factors, for-profit nursing homes are more likely to be larger (O’Neill et al., 2003) and are more likely to be chain-affiliated (Grabowski & Hirth, 2003; Stall et al., 2020). As expected, multiple studies in our review found that larger nursing homes had a higher likelihood to have a COVID-19 case or death (Harrington et al., 2020; He et al., 2020). Chain-affiliated nursing homes may be more susceptible to the occurrence of a COVID-19 case or outbreak, because staff may be particularly able to work in different nursing home locations and across a chain of nursing homes, which could facilitate transmission (Dean et al., 2020).

Secondly, with respect to mediating process factors, for-profit nursing homes are more likely to face staffing shortages and shortages of PPE. Staffing shortages have been associated with for-profit homes as the profit motive may promote financial savings through the reduction of labour costs as was previously reported in the literature (McGregor et al., 2005), and this is reflected in one study in our review (Xu et al., 2020). Staff shortages were most frequently measured as staffing ratios in this review; however, this may reflect an assumption that low staff equates to staffing shortages (i.e., some nursing homes may choose to have lower staff ratios depending on their organisational structure). Moreover, during the first wave of the COVID-19 pandemic, it was problematic for the majority of nursing homes to obtain adequate supplies of PPE, which could have been another mediating factor. Supply chains within and across countries were significantly disrupted, and hospitals had been given a higher priority to receive supplies (World Health Organization [WHO], 2020). While our review found mixed results with access to adequate PPE supplies and potential profit motives, two other multivariate analyses studies found that more PPE supply shortages existed in the for-profit sector than in the non-profit and publicly-owned homes sector (Gibson & Greene, 2020; Li et al., 2020b). One study found significant shortages of N95 masks and gowns among for-profit private equity-owned nursing homes compared to non-profit and publicly-owned homes, but they did not find a difference in shortages for the other types of PPE supplies (e.g., surgical masks and eye protection) (Braun et al., 2020). Possible explanations are that for-profit providers had lower PPE stock at the start of the pandemic in keeping with their efficiency maximising behaviour, for-profits may be less likely to actively seek PPE supply during high pandemic prices, or for-profit homes had more cases overall which intensified the situation, which further exacerbated these performance differences later as the pandemic evolved.

Finally, the relationship between ownership status and mediating contextual factors – including location, area,
and the local number of cases (Sugg et al., 2020) – is more uncertain. However, one study from the Netherlands shows that for-profit nursing homes are more often located in affluent regions (Bos et al., 2020).

**Study Strengths and Limitations**

To the best of our knowledge, this rapid literature review was the first peer-reviewed study that specifically synthesised literature on the relationship between ownership status and COVID-19 outcomes in the nursing home sector. Other reviews have analysed organisational characteristics as a whole (National Collaborating Centre for Methods and Tools, 2020). In contrast to most literature reviews, which are usually carried out after the occurrence of an event to inform future work, this rapid literature review was performed during a time of crisis and can be used to guide immediate and future policy and research within that same crisis.

Our review also has its limitations. Firstly, the majority of the included studies were performed in the United States and Canada. Only one study came from the European Union (i.e., France). This means that we could only include three different healthcare systems. These findings are context dependent and may not necessarily be generalisable. Secondly, the authors are aware that we had to exclude emerging literature (i.e., upcoming papers from England and other jurisdictions) because these studies had not yet been peer reviewed at the time of writing (e.g., Morciano et al., 2020; Shallcross et al., 2020). Thirdly, the majority of the included studies were of low or medium quality, which is understandable due to the type of studies that could be actually carried out during a novel pandemic in a timely fashion. However, we hope that future studies will use advanced data (e.g., longitudinal) and methodologies (e.g., instrumental variable approach) to study this phenomenon. Lastly, our rapid literature review may have missed some articles that, for example, were not available through PubMed or Web of Science. For example, our rapid review did not pick up an article from the United Kingdom (Burton et al., 2020).

**Policy implications**

The findings of this study have a number of important implications for future practice. Our findings suggest that policy makers should be aware of the influence that ownership status may have on COVID-19 and other infectious disease-related outcomes. Even though mediating factors such as lower staffing levels and reduced access to PPE and testing may explain a large share of the relationship, these factors are likely to still be related to ownership structures. For example, staff shortages are related to outbreaks but are also more likely among for-profit nursing homes. Hence there are two approaches: (a) dis-incentivise for profit ownership structures or favour non-profit or publicly-owned nursing homes; (b) or improve the regulation of the underlying factors that appear to influence COVID-19 outcomes and in most cases quality of care more widely; for example, recommendations on the adoption of higher minimum staffing standards (Tavenner & Conway, 2012).

**Implications for Research**

Further research is required on this subject. For example, we know too little about how generalisable these findings are to other contexts. Hence, we recommend research that studies this subject be further conducted in Europe and Asia. In addition, we need more high-quality studies to investigate this matter further. This relates to the fact that we should invest in better public data collection to better monitor quality outcome measures of interest. One question remains unanswered and that is whether there is an interaction between the mediating factors and ownership status. None of the studies in our rapid literature review included an interaction term such as chain affiliation and ownership. We therefore recommend including these in future studies.

**Conclusion**

This rapid literature review has found that most studies demonstrate a relationship between for-profit ownership and increased COVID-19 cases, outbreaks, and/or mortality outcomes. According to unadjusted figures, for-profit owned nursing homes had worse COVID-19 outcomes (e.g., number of COVID-19 deaths among residents). However, as soon as the models control for other variables, the relationship disappeared, attenuated, or resulted in a mixed picture. Characteristics such as lower staffing levels and reduced access to adequate PPE were significantly associated with for-profit status on one hand; and COVID-19 cases and outbreaks on the other. This provides a more complex picture of the relationship between ownership and response to the COVID-19 pandemic. It also presents a way forward from a policy perspective. Even as discussions are undertaken about the values that underlie the future of LTC funding models, and whether to move away from for-profit models, steps can be taken now within existing ownership structures to address the factors most closely associated with outcomes. Although COVID-19 has been a wake-up call on the need for reform in the nursing home sector over the longer-term, measures (such as stable staffing models and employment standards, secure PPE supply, and avoidance of over-crowding) must be implemented now in the short-term in order to reduce the terrible impact of COVID-19 in nursing homes.

**Additional Files**

The additional files for this article can be found as follows:

- **Table A1.** Search strings used in PubMed and Web of Science. DOI: https://doi.org/10.31389/jltc.85.s1
- **Table A2.** Risk of Bias assessment tool. DOI: https://doi.org/10.31389/jltc.85.s2
- **Table A3.** Summary of findings table plus risk of bias (in alphabetic order). DOI: https://doi.org/10.31389/jltc.85.s3
- **Table A4.** Included control variables. DOI: https://doi.org/10.31389/jltc.85.s4

**Competing interests**

The authors have no competing interests to declare.


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