JOURNAL OF LONG-TERM CARE

Care-Management Proximity and the Survival of Home-Visit Nursing Agencies in Japan, 2020–2025: A National Cohort Study

RESEARCH

HIROYUKI TAJIMA

LSE Press

ABSTRACT

Context: Japan's home-visit nursing providers grew by 37.8% in 2020–2025, with growth concentrated in the least aged municipalities, while 44 older, smaller municipalities lost all provision. Whether survival differences linked to care-management integration reflect ownership or proximity is unknown.

Objectives: To identify organisational and spatial predictors of closure, separating ownership from proximity.

Methods: All 11,778 home-visit nursing stations of December 2020 were followed through December 2025 in open data; exits leaving another provider at the same site or a nearby same-corporation provider were not counted as closures. Survival models linked closure to service scope, corporate scale, care-management ownership and (exploratory) distance to the corporation's nearest care-management office.

Findings: Overall, 2,141 (18.2%) closed. Care-management ownership (time ratio 1.46, 95% confidence interval 1.22–1.76) and broader service scope (1.24, 1.05–1.46) predicted longer survival, and more offices (0.87, 0.78–0.96) and later entry shorter survival; neither scope nor scale held among multi-service corporations. Owners within 0.5 km of their office, mostly at the same address, outlasted non-owners (1.63, 1.35–1.97); owners further away did not differ significantly (1.14, 0.91–1.44). Among owners, proximity (1.45, 1.22–1.72) persisted within corporations (hazard ratio 0.66, 0.50–0.88), unlike another operator's nearby office (0.93, 0.78–1.11).

Limitations: Staffing is unrecorded; 41% of corporate identifiers rely on names; co-location may mark a better-paid category; non-reporting stations can appear closed; distance is straight-line; follow-up overlaps the pandemic.

Implications: The advantage of care-management integration tracks proximity, largely co-location, more than ownership; coordination, referral steering, or better-resourced stations could explain it, and care-manager independence rules may need to consider location.

CORRESPONDING AUTHOR:
Hiroyuki Tajima
Faculty of Nursing, Shumei University, Japan
tajima@mailg.shumei-u.ac.jp

KEYWORDS:
home-visit nursing; long-term care; care coordination; organisational survival; spatial proximity; Japan

TO CITE THIS ARTICLE:
Tajima, H. 2026. Care-Management Proximity and the Survival of Home-Visit Nursing Agencies in Japan, 2020–2025: A National Cohort Study. *Journal of Long-Term Care*, (2026), pp. 427–448. DOI: https://doi.org/10.31389/jltc.676

1. INTRODUCTION

Since universal long-term care insurance (LTCI) began in 2000, Japan has relied on home- and community-based services to let frail older adults remain at home (Campbell and Ikegami, 2000; Tsutsui and Muramatsu, 2005), a model widely studied by other ageing societies (Tamiya *et al*., 2011). Home-visit nursing (訪問看護) is central to this policy, delivering wound and medication management, chronic-disease monitoring and end-of-life care to people who cannot travel to a clinic. It is paid for from two sources: by LTCI for most certified older clients, and by health insurance for others, including clients with terminal cancer or other specified conditions, those receiving psychiatric home-visit nursing, and those without LTCI certification, so stations differ in how far they depend on LTCI clients. The policy depends on a sufficient supply of agencies, and Japan's nursing workforce faces geographically uneven shortages expected to persist as demand grows (Kaneda and Yamashiro, 2023).

Two literatures bear on whether nursing remains available locally. Organisational ecology treats survival as a function of an organisation's age and structure (Carroll and Hannan, 2000): Young organisations face a 'liability of newness' (Freeman, Carroll and Hannan, 1983; Singh, Tucker and House, 1986; Stinchcombe, 1965), and those that alter their scale or scope face renewed failure hazards (Hannan and Freeman, 1984). In Japan, a national survey linked the financial performance of home-visit nursing agencies to staffing, client numbers, hospital ownership, and the number of cooperating hospitals (Fukui *et al*., 2014). Japanese-language studies have related the financial surplus of stations to staffing, daily visits per nurse, and the monitoring of income and expenditure (Iida *et al*., 2019), described how managers of stable stations, expecting existing clients' care to end, work to keep a steady flow of new clients (Yamaguchi, Yoshimoto and Sugita, 2016), and described the stations that closed in 2015–2017 from the same disclosure system used here (Kashiwagi, 2024). US research has examined market-area exit by home health agencies, including whether public quality reporting prompted selective exit (Jung and Feldman, 2012). In England, home care agencies close more often where competition is greater and quality lower (Allan, 2024), and research on care homes has examined the determinants of closure (Allan and Forder, 2015), closures enforced by the regulator (Bach-Mortensen, Goodair and Degli Esposti, 2024), how local authorities manage them (Zafar, Taylor and Glasby, 2026), and what they cost (Iqbal *et al*., 2026). Comparable evidence from a social insurance system with a national fee schedule and uniform designation standards is limited. A second literature treats access as the fit between where care sits and the people it serves (Guagliardo, 2004; Luo and Qi, 2009; Penchansky and Thomas, 1981; Wang, 2012), and establishes that care coordination, in which the providers serving one person act on shared and current information, improves outcomes and reduces avoidable use of services (Baxter *et al*., 2018; Tricco *et al*., 2014). For frail older people living at home, coordinated and integrated interventions and case management have improved several outcomes, although effects on functioning and on carers are less consistent (Eklund and Wilhelmson, 2009; You *et al*., 2012).

Japan's LTCI assigns the coordinating role to care managers (介護支援専門員). Eligibility is decided by the municipality, whose certification board determines the level of need. Care-management offices may submit the application on a client's behalf, which they did for 35.1% of applications in fiscal year 2024 according to the Ministry of Health, Labour and Welfare (MHLW, 2025), and municipalities may contract them to conduct the assessment interview for renewals (Long-Term Care Insurance Act, 1997: Article 28(5)), but they do not certify need. Their core task is to assemble the client's services into a care plan, arrange the providers who deliver it, and revise the plan as the client's condition changes; the care manager has no formal role for clients whose nursing is paid by health insurance. Care managers also work in residential facilities and community comprehensive support centres; here 'care management' refers to community-based care-management offices (居宅介護支援事業所), where plans for people living at home are written.

Many nursing corporations run such an office themselves, and the literature on vertical integration treats this as a single variable: ownership of the coordinating function. Frameworks of integrated care distinguish what ownership can and cannot deliver. Integration ranges from linkage through coordination to full integration (Leutz, 1999), and common ownership or governance is organisational integration, whereas the coordination of one person's care across time, place, and discipline is clinical integration (Kodner and Spreeuwenberg, 2002; Valentijn *et al*., 2013); the first does not guarantee the second. There are two reasons to separate ownership from proximity. The formal products of care management, the plan and the record, can be transmitted at no cost, so if integration worked only through them, distance should not matter once ownership is held constant. The informal part is harder to transmit: noticing that a client's condition has shifted, raising it before the next review, adjusting an arrangement in passing. If the benefit lies there, it should decay with distance even inside one corporation. Ownership and location are also separable in practice: A corporation may run its care-management office in the same building as a station or in another prefecture.

The most directly comparable study, a nationwide panel of home-visit nursing agencies after the 2012 fee revision, included provision of care management within

the same organisation among its covariates. It was associated with fewer closures in bivariate comparisons but was not retained in multivariable models that also included nurse staffing and caseload (Kashiwagi and Morioka, 2021). An ownership indicator pools arrangements in which nursing and care management sit together with those in which they do not, so separating the two may clarify what integration contributes.

This study follows every home-visit nursing station in Japan from December 2020 to December 2025 in a national, wave-by-wave panel. It first describes where capacity was gained and lost, since the closure of an agency is not by itself a loss of local service, and then asks which organisational and spatial characteristics distinguished the agencies that survived, separating ownership of a care-management office from its proximity. Proximity to the corporation's own care-management office is the primary exposure, analysed in an exploratory way (§2.5); ownership, service scope and corporate scale, drawn from the organisational literature, are secondary exposures; and agency age is an adjustment covariate whose association with closure is also reported (§3.3).

2. METHODS

2.1 STUDY DESIGN, DATA SOURCE, AND SETTING

This retrospective cohort study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guideline (von Elm *et al.*, 2007). The MHLW publishes facility-level records for LTCI providers through the Long-Term Care Service Information Disclosure System (介護サービス情報公表システム), an open-data feed covering all 35 LTCI service types that may be reused freely, with attribution, under the Ministry's terms of use. Providers must report to the prefecture when they start to provide services and then each year, unless they received no more than 1,000,000 yen in LTCI payments in the year before the reference date, in which case reporting is voluntary (Long-Term Care Insurance Act, 1997: Article 115–35(1); Ordinance for Enforcement of the Long-Term Care Insurance Act, 1999: Article 140–44). A station serving mainly health-insurance clients can therefore drop out of the data while still operating; §2.3 and §3.7 examine this.

Eight waves were downloaded, from December 2020 to December 2025: 1,782,733 facility-wave records across all service types. Waves were published in December 2020, June 2021, December 2021, June 2022, and December 2022, then every six months; the analysis used the December waves of 2023, 2024 and 2025 and not the June waves, so the intervals are approximately 0.5 years for the first four and 1.0 year for the last three. Each record carries 24 fields (Supplementary Methods S1), including the provider number, address and coordinates, and the operating corporation's national corporate number and name. The files contain no measure of staffing, caseload or client volume and no designation or commencement date; the capacity field is uninformative for home-visit nursing, being 0 for 55% of records and missing for a further 22%.

2.2 ANALYTIC COHORT

The baseline cohort comprises all home-visit nursing providers (service code 130) present in December 2020 (n = 13,032), the complete national population rather than a sample. Provider form is classified from the third digit of the provider number: 5, 6, and 7 denote a freestanding station, 1 and 3 denote a hospital or clinic under deemed designation (みなし指定), which lets medical institutions bill for home-visit nursing as an ancillary activity; validation against facility names is reported in Supplementary Methods S1.

The analytic cohort is restricted to stations (n = 11,778; the remaining 1,254 are deemed-designated institutions). Home-visit rehabilitation (service code 140) can, by regulation, be provided only by hospitals, clinics, long-term care health facilities and integrated facilities for medical and long-term care (介護医療院), never by a freestanding station, so any comparison of the second service a corporation runs would otherwise be confounded with provider form. Deemed-designated institutions also disappeared from the data at about twice the rate of stations (43.3% vs 21.6% over five years, counting every disappearance; Figure 1). Figure 2A shows their survival curves, with closure of stations defined as in §2.3. The full cohort is analysed only as a sensitivity analysis, with provider form as a covariate.

2.3 OUTCOME

The outcome is the closure of a station. A provider number absent from a given wave and every later wave is a candidate closure; numbers that disappear and later reappear are treated as reporting gaps. Provider numbers are also reissued when a corporation changes or agencies merge, and a site can pass to another provider, so each candidate closure was classified by whether a new home-visit nursing provider number (one first recorded after December 2020), of any corporation, appeared within 100 m at or after the last wave at which the station was present, or a home-visit nursing provider of the same corporation was still operating within 500 m in December 2025. This is the registry analogue of a competing event (Austin, Lee and Fine, 2016; Fine and Gray, 1999), but because it concerns what a recorded exit means, the event is redefined instead of being modelled with subdistribution hazards. Of 2,548 numbers that disappeared, 407 (16.0%) met one of these conditions; they are not counted as closures and are censored at the last wave at which the station was present (Supplementary Table S10). Of the 378 exits with

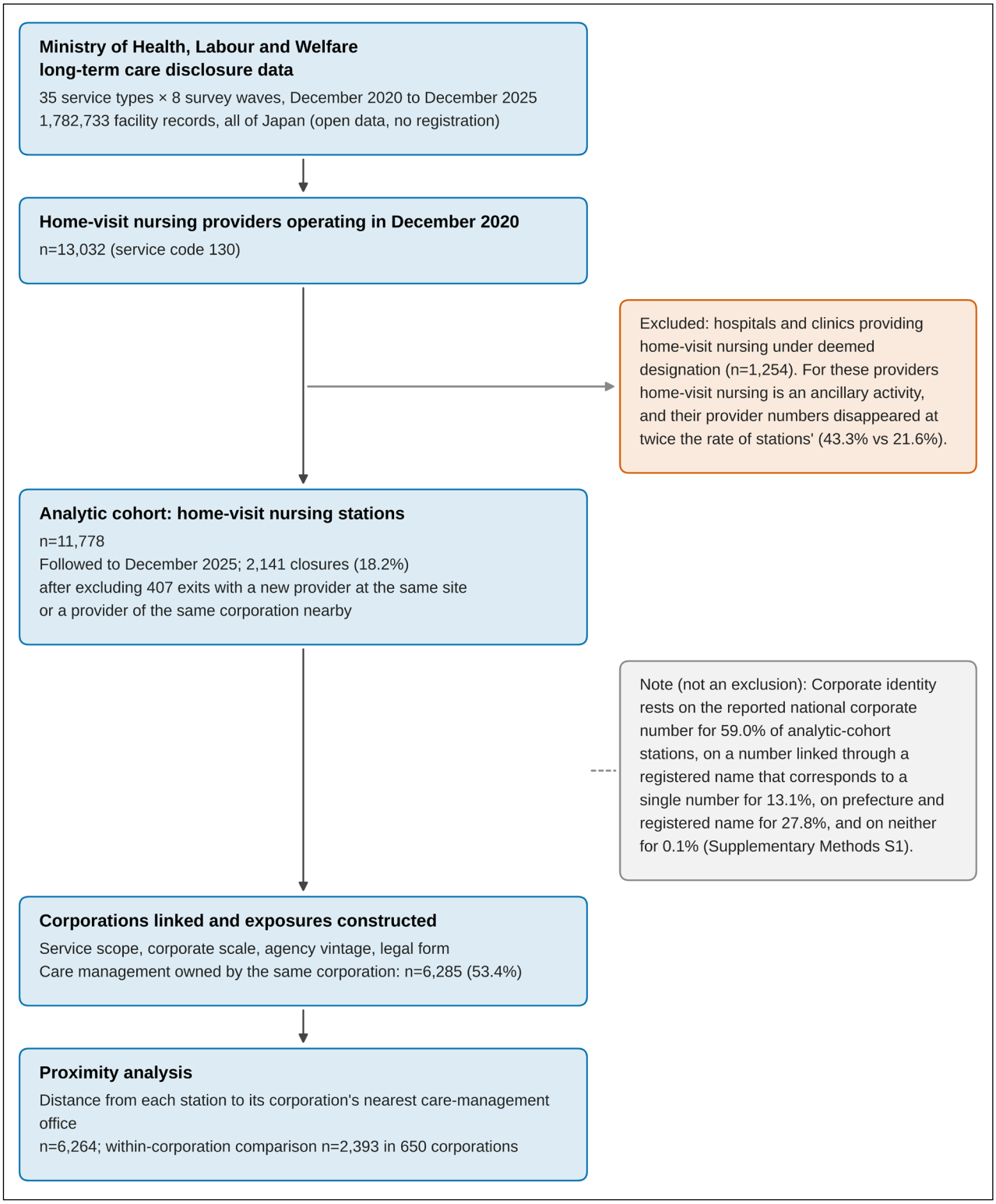

Figure 1 Cohort derivation and data flow. All providers of home-visit nursing operating in Japan in December 2020 (*n* = 13,032, service code 130), drawn from the Ministry of Health, Labour and Welfare's long-term care disclosure system (35 service types × 8 waves, December 2020–December 2025; 1,782,733 facility records nationwide; open data, no registration). Hospitals and clinics providing home-visit nursing under deemed designation (*n* = 1,254) are excluded from the analytic cohort because home-visit nursing is an ancillary activity for these providers, whose provider numbers disappeared at roughly twice the rate of freestanding stations (43.3% vs 21.6%; exits of these institutions were not classified). The analytic cohort of 11,778 stations was followed to December 2025; of 2,548 provider numbers that disappeared, 407 had a new home-visit nursing provider at the same site or a provider of the same corporation nearby, leaving 2,141 closures (18.2%). Corporate identity rests on the reported national corporate number for 59.0% of analytic-cohort stations, on a corporate number linked through a registered name that corresponds to a single number for 13.1%, on prefecture and registered name for 27.8%, and on neither for 0.1% (shown as a note, not an exclusion; Supplementary Methods S1). Proximity analysis uses the 6,264 stations whose corporation also runs a care-management office with usable coordinates; the within-corporation comparison uses the 2,393 stations in 650 corporations with two or more such stations, of which 366 corporations had stations on both sides of the 0.5 km threshold.

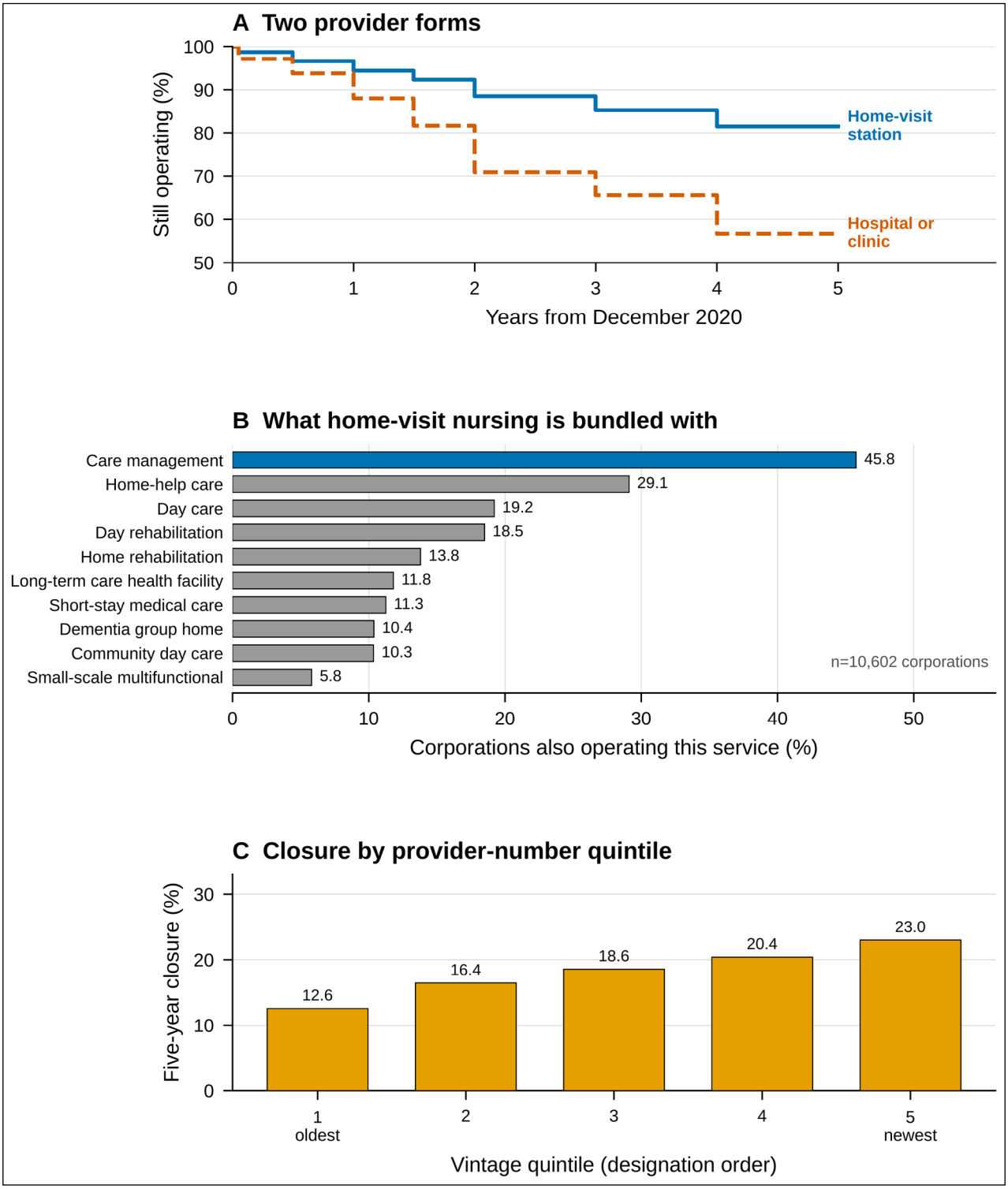

Figure 2 Provider form, service bundling, and provider-number vintage. **(A)** Kaplan–Meier survival for freestanding stations versus deemed-designated hospitals and clinics; closure is defined as in §2.3 for stations, and for hospitals and clinics, whose exits were not classified, every disappearance of a provider number is counted. **(B)** Among corporations operating at least one home-visit nursing service in December 2020 (n = 10,602), the percentage also operating each of the 10 most common other long-term care insurance services. **(C)** Among stations only (n = 11,778), five-year closure by quintile of the provider-number rank described in §2.4, which tracks the published date of commencement (Spearman's ρ = 0.78 in a random sample of 602 stations).

a new number at the same site, the new number carried the same corporate identifier for 42 and had appeared by the wave at which the station disappeared for 187, so the rule covers replacement at the same site as well as renumbering and succession; limiting it to those 187 is examined in §3.7. The primary outcome counts the remaining 2,141 (18.2% of the cohort); results under the wider definition are reported in §3.7. A closure is the loss of a station, not necessarily a loss of local capacity, which is examined at the municipal level in §3.2.

To check that disappearance marks closure, the published facility pages of a random sample of 800

cohort stations, retrieved in September 2026, were examined (§2.4). Of the 146 sampled stations counted as closures, 144 (98.6%) no longer had a page and 2 did. A page check cannot detect a station that continues to operate without reporting, so the consequences of misclassification are examined by quantitative bias analysis (§2.6).

Duration runs from 31 December 2020 to the last wave at which the station was present; stations present in December 2025 are censored at five years. The 198 stations (1.7%) that exited before the first follow-up wave were assigned a nominal 0.05 years, since accelerated failure time (AFT) models require positive durations. Time ratios (TRs) for the primary exposure range from 1.495 to 1.404 across assigned values from 0.01 to 0.25 years, and excluding the 83 of these stations in the distance sample gives 1.324, with a 95% confidence interval (CI) of 1.148–1.528.

2.4 EXPOSURES AND COVARIATES

Primary exposure. For stations whose corporation also ran a care-management office, whether the corporation's nearest such office lay within 0.5 km (great-circle distance). The cut-point was chosen on the data: Of seven thresholds from 0.05 to 5 km, it gave the lowest Akaike information criterion, although those from 0.2 to 1 km were within 1.2 units of it (Supplementary Table S17). It is retained because it corresponds to a few minutes on foot; all seven thresholds are reported (§3.5), and the CIs for the primary threshold do not account for the selection. Distance as log(km + 1) is a secondary specification. A separation under 0.05 km is not used as an exposure in its own right: Together with a shared street address, it serves only to approximate sharing a site with the office (§3.5), an approximation limited by the precision of the coordinates (§3.7). The source does not document how coordinates are assigned; their precision is examined in §3.7.

Ownership and proximity together. To ask whether the ownership association depends on distance, all stations were also classified into three groups: no care-management office in the corporation, an office 0.5 km or more away, and an office within 0.5 km.

Secondary exposures, entered jointly. *Care-management ownership*: The corporation ran at least one care-management office (service code 430) anywhere in Japan in December 2020 (6,285 stations, 53.4%). The indicator pools near and distant arrangements, so its coefficient averages over the distance distribution. It does not capture care managers in residential facilities, community comprehensive support centres or (nursing) small-scale multifunctional services (小規模多機能型居宅介護, 看護小規模多機能型居宅介護), which plan care for their own users; corporations whose only care planning is of that kind are coded as non-owners, which would bias the ownership contrast towards the null. *Service scope*: log of the number of distinct LTCI service types, of 35, that the corporation ran. *Corporate scale*: log of the total number of offices of any type. The *number of home-visit nursing branches* (1, 2, 3–4, 5+) is examined in a separate model (§3.3).

Placebo exposures. The primary placebo is whether the nearest care-management office run by a different corporation lay within 0.5 km, on the same scale as the primary exposure. Continuous distances to that office and to the corporation's own nearest day-care (通所介護, service code 150) office are reported as secondary placebos. Nearest neighbours were found with a k-d tree over facility coordinates.

Adjustment covariates. Prefecture fixed effects enter every model. The log number of competing home-visit nursing agencies and of all LTCI facilities in the municipality, and legal form, taken from the registered corporate name (joint-stock company as reference), are added in separate models to test whether they account for the main associations (§3.6), and the proximity models are repeated in urban and rural municipalities, split at the median, across stations, of the number of LTCI facilities in the municipality (§3.7).

Agency vintage (proxy). The files record no commencement date, and the dates published on facility pages cannot be retrieved for closed stations, because a page is withdrawn when a facility closes; each station's provider number was therefore ranked within its six-digit jurisdiction block, using only providers present at baseline, and the rank was rescaled to the unit interval. Against the date of commencement published on each facility's page, retrieved for a random sample of 800 cohort stations, of which 602 still had a page, the rank correlated strongly with commencement (Spearman's $\rho = 0.78$), with median commencement rising from March 2000 in the lowest rank quintile to July 2019 in the highest (Supplementary Methods S2). The validation covers surviving stations only. All primary models are reported with and without the proxy (§3.7).

Corporate identifier. The 13-digit national corporate number (法人番号) was reported for 59.0% of the analytic cohort. A record without it was assigned a number when its registered name, within the same prefecture, corresponded to exactly one number among the December 2020 records of all 35 service types (13.1%); otherwise, prefecture and name served as the identifier (27.8%), and the 0.1% reporting neither were treated as single-office corporations, and hence as non-owners. Only December 2020 records were used, so that identification does not depend on later survival, and the rule has no tuning parameter (Supplementary Methods S1; results without the linkage in Supplementary Table S19).

Partner service. For corporations running home-visit nursing plus exactly one other LTCI service, the identity of that other service was compared. This comparison

is descriptive, since which second service a corporation runs is not exogenous.

2.5 STATISTICAL ANALYSIS

Time to closure was modelled with Weibull AFT regression with prefecture fixed effects, reporting TRs; a TR above 1 indicates longer expected survival. Models are unpenalised, and their CIs and *p*-values use standard errors clustered on the corporation (sandwich estimator), since one corporation can contribute several stations. Because closures are observed only at wave boundaries and intervals are unequal, a discrete-time model was also fitted to the station-wave panel (76,102 station-periods) with a complementary log-log link, the log of interval length as an offset, period dummies for the baseline hazard, prefecture fixed effects and corporate clustering (Supplementary Table S14); for its proximity model, clustering on the municipality is reported as an alternative.

The main models were also estimated as Cox models (Cox, 1972) stratified by prefecture, with standard errors clustered on the corporation. For proximity, Cox models were additionally stratified on the corporation, so that the estimate is identified only from differences between branches of the same corporation. This removes differences between corporations that are constant over the period, such as management, capital, strategy, legal form, and founding era, but not selection within a corporation as to which branch is sited near its care-management office. It is estimable for the 2,393 stations in the 650 corporations that ran a care-management office and two or more stations with usable coordinates; only corporations with stations on both sides of the threshold contribute to the estimate. The within-corporation models use model-based standard errors, which here are more conservative than standard errors clustered on the corporation (§3.5).

Kaplan–Meier estimates provide descriptive curves. The proportional-hazards assumption, assessed with scaled Schoenfeld residuals, was not rejected for any covariate of the Cox models reported in §3.3 to §3.5 (smallest $p = 0.08$). Collinearity between scope and scale was assessed with variance inflation factors and by entering each separately. The study was not preregistered, so no analysis was formally pre-specified. The organisational models are those of the original analysis; the closure definition and the corporate identifier were revised after it (§2.3, §2.4); and the proximity analyses, including the choice of threshold, the placebos and the mechanism tests, as well as the time-varying and measurement-error analyses, are exploratory. Analyses used Python 3.12 with lifelines 0.30.3, statsmodels 0.15, and python-louvain 0.16.

2.6 SENSITIVITY ANALYSES

The main analysis was repeated restoring the deemed-designated institutions with provider form as a covariate; restricting to corporations running two or more service types; restricting to stations with a directly reported corporate number; splitting municipalities into urban and rural; restricting to corporations running only home-visit nursing and care management; controlling for a corporation's organisational archetype, derived by community detection over service portfolios (Blondel *et al.*, 2008; Supplementary Note S12); and entering legal form before and after adjustment for the other exposures. To test referral steering (§4.3), the primary proximity model was estimated with an interaction between proximity and the centred log number of competing agencies in the municipality, within tertiles of that number, and with an interaction between proximity and the corporation's share of local agencies.

Exposures were also entered as time-varying covariates in the discrete-time model for stations whose corporation had a corporate number, with care-management offices matched to the corporation at every wave (Supplementary Note S20). Error in the distance measure was examined by treating pairs registered at the same address as co-located, by comparing stations 50–500 m from the office at the same and at a different street address (town, block and lot, ignoring building, room and facility names), by adding random positional error (standard deviation 25–200 m) to every location, and by multiplying distances by detour factors of 1.2 to 2.0, constant or larger in rural municipalities (20 replicates of each random scenario; Supplementary Note S21).

A quantitative bias analysis reclassified as survivors, at random, a share of the closures in the comparison group equal to the false-closure rate observed in the page check or its upper 95% confidence limit, placing all misclassification where it would most inflate the estimates (40 replicates each). Because the page check cannot detect stations that operate without reporting, a tipping-point analysis repeated this at higher rates to find the share of misclassified closures at which each estimate loses significance (Supplementary Note S16).

2.7 ETHICS

This study used only publicly available, facility-level administrative data. No patient-level or individually identifiable personal information was involved, and no ethical review was required under Japanese research governance for secondary analysis of open administrative data.

Organisations, however, are identifiable. Every record carries a unique provider number and coordinates, and the derived dataset deposited for reuse links identifiable businesses to a closure outcome. The analysis describes patterns across a national population of providers and is not suitable for ranking, rating, or penalising individual providers. The models omit staffing, finances, and case mix; the closure measure cannot distinguish business failure from retirement or planned reorganisation, and an association estimated across 11,778 stations says nothing about any particular one.

CHARACTERISTIC	OWNS CARE MANAGEMENT (*n* = 6,285)	DOES NOT (*n* = 5,493)	STANDARDISED DIFFERENCE
Outcome over five years			
Closed by December 2025, *n* (%)	922 (14.7)	1,219 (22.2)	−0.19
Corporate strategy			
Service types operated, median (IQR)	5 (3–8)	1 (1–2)	2.42
Offices operated, median (IQR)	6 (3–14)	1 (1–2)	1.41
Two or more nursing branches, *n* (%)	2,496 (39.7)	670 (12.2)	0.66
Agency			
Vintage rank, mean (SD)	0.43 (0.28)	0.58 (0.26)	−0.58
Joint-stock company, *n* (%)	1,992 (31.7)	3,015 (54.9)	−0.48
Local environment			
Competing agencies in municipality, median (IQR)	18 (8–32)	21 (10–34)	−0.10
All care facilities in municipality, median (IQR)	232 (116–401)	245 (128–415)	−0.06

Table 1 Baseline characteristics of home-visit nursing stations, December 2020, by whether the operating corporation also ran a care-management office.

IQR, interquartile range; SD, standard deviation. Standardised differences are computed on the analytic scale (logarithmic for count variables).

A standardised difference below 0.10 indicates that the two groups are balanced on that characteristic.

The two groups differ sharply on corporate strategy and agency vintage and are similar, though not fully balanced, on the local environment.

Closure excludes exits with a new home-visit nursing provider at the same site or a provider of the same corporation nearby (§2.3).

3. RESULTS

3.1 COHORT

Of 13,032 home-visit nursing providers operating in December 2020, 1,254 (9.6%) were hospitals or clinics under deemed designation, leaving 11,778 stations as the analytic cohort. Of these, 2,548 provider numbers disappeared by December 2025, of which 407 had a new provider at the same site or a provider of the same corporation nearby (§2.3); the remaining 2,141 closures give a five-year closure rate of 18.2%. Just over half the cohort (6,285, 53.4%) belonged to a corporation that ran a care-management office; the distance analyses use the 6,264 of these with usable coordinates for both offices. Table 1 compares owners and non-owners. They differ sharply on corporate strategy (median 5 vs 1 service types, standardised difference 2.42; median 6 vs 1 offices, 1.41), on agency vintage (standardised difference −0.58, owners' stations being older) and on legal form (31.7% vs 54.9% joint-stock companies), and are similar on the local environment (standardised differences −0.10 and −0.06 for competitor density and the number of municipal facilities).

3.2 NET CHANGE IN LOCAL CAPACITY

Because every provider is recorded at every wave, entries and exits can be counted directly. Nationally, home-visit nursing providers increased from 13,032 in December 2020 to 17,958 in December 2025, a rise of 37.8%, with 9,318 entries against 4,392 exits.

Expansion was uneven. Of the 1,501 municipalities with at least one provider at baseline, 853 (56.8%) gained providers, 417 (27.8%) were unchanged, and 231 (15.4%) lost providers on net. Forty-four (2.9%) were left with no provider. All 44 were in the lowest of four groups defined by baseline provider count (543 municipalities, median 1 provider), of which 8.1% were left with none; no municipality in the other groups was. Net loss affected 14.4% of municipalities in the group with fewest providers, 23.4% and 21.1% in the two middle groups, and 5.9% in the group with the most (Supplementary Table S18).

Change in provision differed by the age structure of municipalities. Ranking municipalities by the share of residents aged 75 or over, the least aged quartile grew by a median of 49% and moved from 8.1 to 11.9 providers per 10,000 residents aged 75 or over, while the most aged quartile did not grow at the median and moved from 6.0 to 5.9. Because the denominator is fixed at the 2020 Census, these figures understate the decline in provision where the older population grew; change in population over the period was not examined. Net loss was more than four times as common in the most aged quartile as in the least aged (28.5% vs 6.4%), and being left with no provider was far more common (8.3% vs 0.5%). The share aged 75 or over correlated negatively with proportional change in provider numbers (Spearman's $\rho = -0.43$, $p < 0.001$). Municipalities left with no provider were smaller (median population 7,265 vs 43,337) and older (median 22.1% vs 16.4% aged 75 or over) than the median municipality. Among the 1,426 municipalities

COVARIATE	TIME RATIO (95% CI)	*p*	HAZARD RATIO (95% CI)	*p*
Owns a care-management office	1.462 (1.217–1.756)	<0.001	0.716 (0.611–0.838)	<0.001
Service scope (per log service type)	1.235 (1.048–1.456)	0.012	0.834 (0.725–0.961)	0.012
Corporate scale (per log office)	0.870 (0.785–0.964)	0.008	1.128 (1.033–1.232)	0.007
Agency vintage (newest vs oldest)	0.505 (0.415–0.613)	<0.001	1.802 (1.525–2.130)	<0.001

Table 2 Corporate strategy and the closure of home-visit nursing stations, December 2020 to December 2025.

n = 11,778 home-visit nursing stations; 2,141 closures. CI, confidence interval.

Column 2: Weibull accelerated failure time model with prefecture fixed effects and standard errors clustered on the operating corporation; a time ratio above 1 indicates longer expected survival.

Column 4: Cox proportional hazards model with the same covariates, stratified by prefecture (a prefecture-specific baseline hazard in place of prefecture fixed effects), with robust standard errors clustered on the operating corporation (11,778 stations in 9,571 corporations); a hazard ratio below 1 indicates a lower rate of closure.

All covariates are mutually adjusted. Agency vintage is the within-block rank of the provider number, which tracks the published date of commencement (Spearman's ρ = 0.78 in a random sample of 602 stations; §2.4); the estimate compares the newest with the oldest rank.

with a station at baseline, net loss was more common in rural than in urban ones (16.6% of 1,218 vs 4.8% of 208; urban and rural as defined in §2.4, so that each group holds about half the stations). The closure rate of stations, by contrast, differed little by age structure (from 17.2% to 19.3% across quartiles of the share aged 75 or over) or between rural and urban municipalities (18.1% and 18.2%), so the uneven change in provision appears to lie mainly in where new providers entered.

3.3 ORGANISATIONAL PREDICTORS OF CLOSURE

Adjusted for prefecture, the vintage proxy and one another, owning a care-management office was associated with longer expected survival (TR = 1.462, 95% CI: 1.217–1.756, $p < 0.001$; because the indicator pools stations near to and far from the office, this averages over the distance distribution, which §3.5 decomposes), as was broader service scope (TR = 1.235 per log service type, 95% CI: 1.048–1.456, $p = 0.012$), while greater corporate scale was associated with shorter survival (TR = 0.870 per log office, 95% CI: 0.785–0.964, $p = 0.008$; Table 2). The discrete-time model gave the same pattern, with hazard ratios (HRs) of 0.720, 0.832, and 1.128, respectively (all $p < 0.05$; Supplementary Table S14). Agency vintage was strongly associated with closure: Stations with the newest provider numbers had about half the expected survival time of those with the oldest (TR = 0.505, 95% CI: 0.415–0.613, $p < 0.001$), and five-year closure rose from 12.6% in the oldest quintile to 23.0% in the newest (Figure 2C).

The scale association did not come from the number of nursing branches. Relative to a single station, operating 2 (HR = 1.069, 95% CI: 0.901–1.268), 3 to 4 (1.107, 0.850–1.442) or 5 or more stations (1.160, 0.835–1.613) was not associated with closure in a Cox model stratified by prefecture with corporate-clustered standard errors, and unadjusted five-year closure ranged only from 15.9% to 18.6% across the four groups.

3.4 THE IDENTITY OF THE SECOND SERVICE

Care management was the service most often run alongside home-visit nursing (Figure 2B). Among 2,019 stations whose corporation ran home-visit nursing plus exactly one other service, the 1,145 paired with care management closed less often than those paired with any other service (13.3% vs 21.2%; TR = 1.598, 95% CI: 1.200–2.128, $p = 0.001$; Cox HR = 0.654, 95% CI: 0.509–0.840). Individual comparisons were mostly underpowered: Relative to a care-management partner, only a home-help-care partner differed significantly (TR = 0.568, 95% CI: 0.399–0.808, $p = 0.002$; $n = 409$), and the other partners with at least 50 stations had point estimates below 1, with CIs spanning it (Table 3, Figure 3A).

3.5 DISTANCE TO THE CORPORATION'S CARE-MANAGEMENT OFFICE

Of the 6,264 stations whose corporation ran a care-management office with usable coordinates, 4,497 (71.8%) lay within 0.5 km of it, and 3,743 of these (83.2%) within 0.05 km, most of them at the same registered address. Five-year closure was 13.2% within 0.5 km and 18.3% further away, against 22.2% among stations whose corporation ran no care-management office (unadjusted proportions; Kaplan–Meier curves in Figure 4A). By band, it was 18.1% at 0.5–2 km, 19.9% at 2–10 km, and 16.4% beyond 10 km, so the gradient is not monotonic beyond walking distance (Figure 4B). In absolute terms, closure within walking distance was 5.1 percentage points lower than further away, about 51 fewer stations lost per 1,000.

Adjusted for prefecture, scope, scale, and vintage, stations within walking distance of their corporation's office survived longer than those further from it (TR = 1.449, 95% CI: 1.218–1.725, $p < 0.001$). With non-owners as the reference, owners within walking distance survived longer (TR = 1.632, 95% CI: 1.352–1.969, $p < 0.001$), whereas owners whose office was further away did not

SECOND SERVICE	*n*	CLOSURES, *n* (%)	TIME RATIO (95% CI)	*p*
Care management	1,145	152 (13.3)	1 (reference)	
Home-help care	409	92 (22.5)	0.568 (0.399–0.808)	0.002
Community day care	136	27 (19.9)	0.700 (0.413–1.187)	0.185
Day care	119	23 (19.3)	0.786 (0.463–1.332)	0.371

Table 3 When a corporation operates exactly two services, one of them is home-visit nursing: closure by the identity of the second service.

Second services with at least 50 stations are shown (four); the by-partner model is fitted on these n = 1,809 stations. The pooled contrast below includes all 2,019 stations whose corporation ran exactly two long-term care services in December 2020, of which 210 had a rarer second service and are not shown separately. The sample restriction holds the number of services and the provider form fixed; which second service a corporation runs is not randomly assigned, so the comparison is descriptive.

Weibull accelerated failure time models with prefecture fixed effects and corporate-clustered standard errors, adjusted for corporate scale and agency vintage. Care management is the reference category. CI, confidence interval.

Pooled contrast (care management versus any other second service): closure 13.3% versus 21.2%; time ratio 1.598 (1.200–2.128), p = 0.001; Cox hazard ratio (stratified by prefecture, corporate-clustered standard errors) 0.654 (0.509–0.840), p < 0.001. Individual partner comparisons are underpowered.

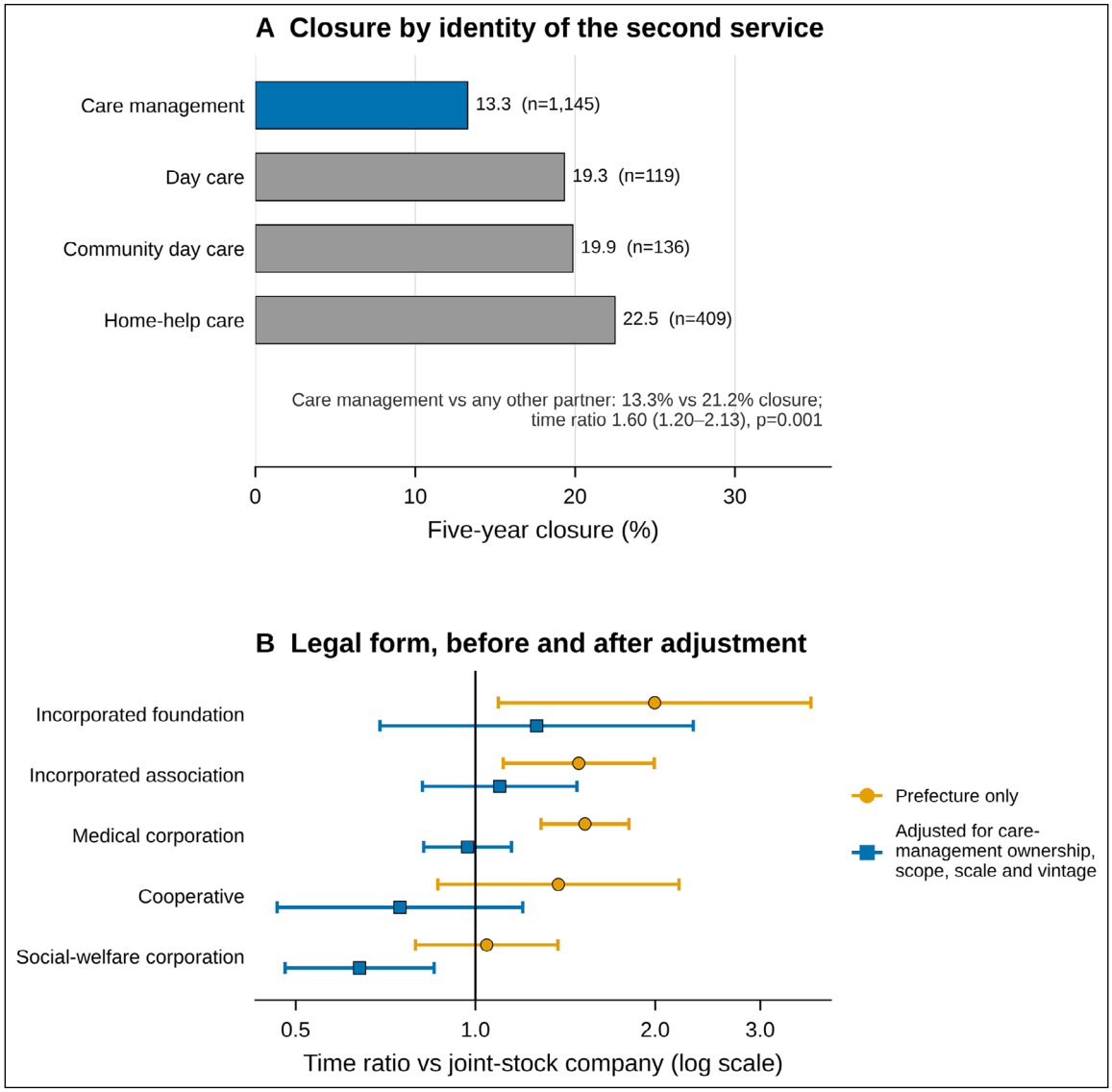

Figure 3 Identity of the second service, and legal form before and after adjustment. **(A)** Among the 2,019 stations whose corporation ran exactly two long-term care insurance services, five-year closure by the identity of the second service for the four services with at least 50 stations, with the number of stations in each group (§3.4); the pooled time ratio for care management against any other second service, from a Weibull AFT model with prefecture fixed effects adjusted for corporate scale and the vintage proxy, is shown in the panel. **(B)** Time ratios for five non-profit legal forms relative to the joint-stock company (*n* = 5,007), from a model with prefecture fixed effects only and after adjustment for care-management ownership, service scope, corporate scale and the vintage proxy (§3.6); *n* = 11,778 stations, 2,141 closures; bars are 95% confidence intervals. A time ratio above 1 indicates longer expected survival. Closure excludes exits with a new home-visit nursing provider at the same site or a provider of the same corporation nearby (§2.3).

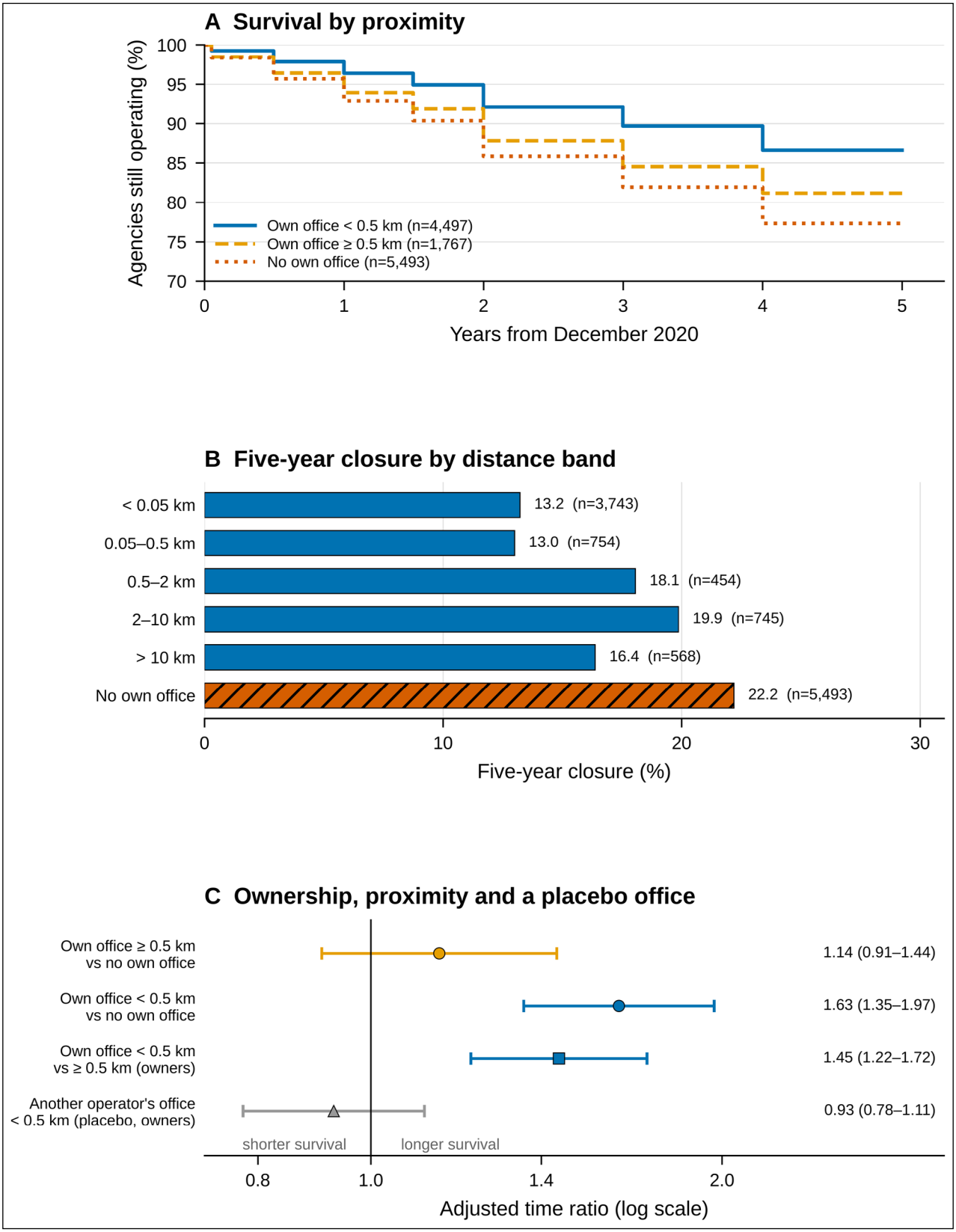

Figure 4 Proximity to care management and closure. **(A)** Kaplan–Meier survival for stations whose corporation's nearest care-management office lay within 0.5 km (n = 4,497) or 0.5 km or more away (n = 1,767), and for stations whose corporation ran no care-management office (n = 5,493); 21 stations whose corporation's office lacked usable coordinates are omitted. **(B)** Five-year closure by distance band and for stations whose corporation ran no care-management office, unadjusted, with the number of stations in each group. **(C)** Adjusted time ratios from Weibull accelerated failure time models with prefecture fixed effects, service scope, corporate scale, and the vintage proxy: The first two rows compare owners within and beyond 0.5 km with non-owners in one model (n = 11,757); the third compares owners within 0.5 km with those further away, and the fourth is the placebo, being within 0.5 km of a care-management office run by another corporation (both n = 6,264). Bars are 95% confidence intervals; a time ratio above 1 means longer expected survival. Closure is defined in §2.3.

differ detectably from non-owners (TR = 1.144, 95% CI: 0.907–1.443, $p = 0.25$; Table 4, Figure 4C, Supplementary Table S15). Every threshold from 0.05 to 2 km gave a TR between 1.28 and 1.46 with a CI excluding 1; at 5 km the TR was 1.288 with a CI that just included 1 (0.996–1.664).

Of the 4,497 stations within 0.5 km, 4,066 (90.4%) were within 50 m of the office or at its street address. Relative to owners 0.5 km or more away, the TR was 1.434 (95% CI: 1.197–1.718) for the 3,743 stations within 50 m, most of them at the same street address, and 2.410 (95% CI: 1.557–3.729) for the 323 stations 50–500 m away at the same street address as the office, a discrepancy that can arise from imprecise coordinates. For the 431 stations 50–500 m away at a different street address, the estimate was smaller and imprecise (1.147, 95% CI 0.832–1.582), and it did not differ significantly from that for the other 4,066 stations within 0.5 km taken together (p = 0.097), so whether the advantage extends to stations on separate premises cannot be determined (Supplementary Table S17).

Being within 0.5 km of a care-management office run by another corporation, which applied to 4,379 of the same stations (69.9%), was not associated with closure (TR = 0.929, 95% CI: 0.777–1.111, $p = 0.42$), and

SPECIFICATION	*n*	TIME RATIO (95% CI)	*p*
Primary exposure: within 0.5 km of the corporation's own care-management office			
Within 0.5 km versus 0.5 km or more (owners only)	6,264	1.449 (1.218–1.725)	<0.001
Wider closure definition (every disappearance counted)	6,264	1.610 (1.352–1.918)	<0.001
Same-site rule limited to new numbers present by the wave of exit	6,264	1.555 (1.296–1.865)	<0.001
Without the agency-vintage proxy	6,264	1.589 (1.331–1.896)	<0.001
Stations with a directly reported corporate number	4,110	1.508 (1.217–1.869)	<0.001
Pairs at the same registered address treated as co-located	6,264	1.469 (1.227–1.760)	<0.001
Excluding stations that exited before the first follow-up wave	6,181	1.324 (1.148–1.528)	<0.001
Corporate archetype additionally controlled	6,264	1.417 (1.190–1.686)	<0.001
Within 0.5 km by distance and street address: reference is 0.5 km or more (owners only)			
Under 50 m	6,264	1.434 (1.197–1.718)	<0.001
50 m to 0.5 km, same street address	6,264	2.410 (1.557–3.729)	<0.001
50 m to 0.5 km, different street address	6,264	1.147 (0.832–1.582)	0.402
Ownership and proximity together: reference is no care-management office			
Own office 0.5 km or more away	11,757	1.144 (0.907–1.443)	0.254
Own office within 0.5 km	11,757	1.632 (1.352–1.969)	<0.001
Placebo: within 0.5 km of another operator's care-management office			
Another operator's office, separate model	6,264	0.929 (0.777–1.111)	0.421
Own office, joint model	6,264	1.446 (1.215–1.721)	<0.001
Another operator's office, joint model	6,264	0.943 (0.788–1.127)	0.517
Alternative proximity thresholds: binary indicator (see note)			
Within 0.05 km	3,743	1.276 (1.083–1.502)	0.004
Within 0.1 km	4,074	1.332 (1.129–1.573)	<0.001
Within 0.2 km	4,285	1.420 (1.199–1.683)	<0.001
Within 0.5 km [primary]	4,497	1.449 (1.218–1.725)	<0.001
Within 1.0 km	4,683	1.462 (1.215–1.759)	<0.001
Within 2.0 km	4,951	1.424 (1.162–1.746)	<0.001
Within 5.0 km	5,370	1.288 (0.996–1.664)	0.054
Secondary specification: continuous distance, per log-kilometre			
Own care-management office	6,264	0.903 (0.843–0.967)	0.004
Another operator's nearest care-management office	6,264	0.985 (0.734–1.321)	0.917
Own care-management office, day-care subsample	2,490	0.940 (0.844–1.047)	0.260
Own day-care centre, day-care subsample	2,490	1.089 (0.979–1.213)	0.118

(Contd.)

SPECIFICATION	*n*	TIME RATIO (95% CI)	*p*
Own care-management office, urban municipalities	3,088	0.893 (0.814–0.978)	0.015
Own care-management office, rural municipalities	3,176	0.911 (0.832–0.998)	0.046
Own office, corporations running only nursing and care management	1,143	0.888 (0.759–1.039)	0.139
Local-environment controls: added to the main model of all stations			
Home-visit nursing agencies in the municipality	11,778	0.998 (0.945–1.055)	0.950
All care facilities in the municipality	11,778	1.031 (0.973–1.091)	0.301

Table 4 Proximity, ownership, placebo tests, and robustness checks.

All estimates come from Weibull accelerated failure time models with prefecture fixed effects and standard errors clustered on the operating corporation, adjusted for service scope, corporate scale and agency vintage; in the subsample of corporations running only home-visit nursing and care management, where scope is constant, for corporate scale and agency vintage only (n = 1,143, as 2 of the 1,145 such stations in Table 3 have no usable coordinates); the local-environment models also include care-management ownership. A time ratio above 1 means longer expected survival; for continuous distance, a time ratio below 1 means that greater separation shortens survival. CI, confidence interval.

Primary exposure: The alternative specifications are described in §2.3, §2.6 and §3.7; the n column gives the estimation sample. By distance and street address: one model on the owners with usable coordinates, comparing three groups within 0.5 km with owners 0.5 km or more away; street address means town, block and lot, ignoring building, room, and facility names.

Ownership and proximity together: one model on all stations except 21 whose corporation ran a care-management office without usable coordinates. Placebo: whether the nearest care-management office run by a different corporation lies within 0.5 km, among the stations whose corporation ran its own office; the joint model enters both indicators.

Thresholds: The n column reports the number of stations falling inside each threshold, not the estimation sample, which is 6,264 throughout. All cut-points are reported so that the choice is transparent; the confidence intervals do not account for the comparison across thresholds.

Continuous distance: The own-office and day-care distances are correlated (Spearman's $\rho = 0.26$) and are entered in separate models (joint entry: Supplementary Table S5). Urban and rural municipalities are split at the median, across stations, of the number of long-term care facilities in the municipality.

Local environment: Neither the density of competing agencies nor the number of all care facilities in the municipality predicts closure once prefecture and corporate covariates are accounted for.

entering both indicators together left the own-office estimate unchanged (1.446, 95% CI: 1.215–1.721; other operator's office 0.943, 95% CI: 0.788–1.127). The continuous distance to another operator's office was not associated with closure either (TR = 0.985 per log-km, 95% CI: 0.734–1.321). Among the 2,490 stations whose corporation also ran a day-care centre, neither distance from that centre (TR = 1.089 per log-km, 95% CI: 0.979–1.213) nor distance from the care-management office (0.940, 95% CI: 0.844–1.047) was associated with closure when entered alone; entered together, greater distance from the care-management office was associated with shorter survival (0.887, 95% CI: 0.796–0.989) and greater distance from the day-care centre with longer survival (1.128, 95% CI: 1.009–1.261; Supplementary Table S5).

The association persisted as the identification strategy was tightened. All rows of this sequence are estimated on the subsample in which the corporate comparison is possible (2,393 stations in 650 corporations, 339 closures), so that the comparison is nested (Table 5 and Figure 5B; Figure 5A plots the estimates of Table 2). In Cox models stratified by prefecture, the HR for being within walking distance was 0.670 (95% CI: 0.538–0.834); adding scope and scale gave 0.656, adding the vintage proxy 0.702, and clustering standard errors on the corporation 0.702 (95% CI: 0.560–0.881). Stratifying on the corporation, so that only branches of the same corporation are compared, gave 0.665 (95% CI: 0.500–0.883, $p = 0.005$; 0.516–0.856 with standard errors clustered on the corporation); this estimate is informed only by the 366 corporations with stations on both sides of the threshold (1,713 stations, 245 closures).

Across the full distance range, each additional log-kilometre was associated with a TR of 0.903 (95% CI: 0.843–0.967, $p = 0.004$). The discrete-time model agreed for both measures (within walking distance, HR = 0.723, 95% CI: 0.623–0.840, $p < 0.001$; log-distance 1.093, 95% CI: 1.030–1.160, $p = 0.003$), and clustering on 1,247 municipalities instead of corporations gave virtually identical intervals.

Three tests addressed referral steering (§4.3; Supplementary Table S15). The interaction between proximity and the centred log number of competing agencies was 0.892 (95% CI: 0.759–1.049). Within tertiles of competitor density (medians 6, 19, and 41 agencies), the proximity TR was 1.559 (95% CI: 1.161–2.094), 1.710 (1.249–2.340) and 1.158 (0.869–1.543), with overlapping intervals and the smallest estimate where competition was greatest. The interaction with the corporation's share of local agencies was too imprecise to be informative (1.655, 95% CI: 0.672–4.078).

IDENTIFICATION STRATEGY	CLOSURES	HAZARD RATIO (95% CI)	*p*
Stratified by prefecture only	339	0.670 (0.538–0.834)	<0.001
Adding service scope and corporate scale	339	0.656 (0.526–0.819)	<0.001
Adding the agency-vintage proxy	339	0.702 (0.560–0.881)	0.002
Robust standard errors clustered on the corporation	339	0.702 (0.560–0.881)	0.002
Stratified on the corporation (within-corporation comparison)	339	0.665 (0.500–0.883)	0.005

Table 5 Care management within walking distance and the closure of home-visit nursing stations, under successively stronger identification strategies.

The sample is restricted to stations whose operating corporation ran a care-management office and two or more home-visit nursing stations with usable coordinates, so that every row is estimated on the same 2,393 stations in 650 corporations with 339 closures. The comparison is between stations whose care-management office lay within 0.5 km and those whose office lay further away, so that ownership is held constant. Table 1 counts nursing branches of any provider form, so 103 owners' stations with two or more branches are not in this sample: 5 without usable coordinates and 98 whose other branches were hospitals or clinics or lacked usable coordinates. CI, confidence interval.

Rows 1 to 4 are Cox models stratified by prefecture (a prefecture-specific baseline hazard, the Cox analogue of prefecture fixed effects); rows 1 to 3 use model-based standard errors, and row 4 clusters them on the corporation, which widens the intervals of the corporate covariates but leaves this one virtually unchanged. The last row stratifies the baseline hazard on the operating corporation, so the estimate is identified only by differences between branches of the same corporation. Stratification removes differences between corporations that are constant over the observation period, such as management, capital, strategy, legal form and founding era, but not selection within a corporation as to which branch is sited near the care-management office. Only corporations with stations on both sides of the threshold inform the last row: 366 corporations, 1,713 stations and 245 closures. The last row uses model-based standard errors; clustered on the corporation, its 95% CI is 0.516–0.856 ($p = 0.002$), so the interval shown is the more conservative.

Closure excludes exits with a new home-visit nursing provider at the same site or a provider of the same corporation nearby (§2.3).

3.6 LOCAL MARKET CONDITIONS AND LEGAL FORM

Neither the number of competing agencies (TR = 0.998, 95% CI: 0.945–1.055) nor the number of all LTCI facilities in the municipality (TR = 1.031, 95% CI: 0.973–1.091) predicted closure (Table 4), and adding either left the ownership estimate essentially unchanged (1.462 and 1.467). Before adjustment, medical corporations, incorporated associations and incorporated foundations appeared to outlast joint-stock companies, and care-management ownership differed widely by legal form, from 96.0% among cooperatives and 89.0% among social-welfare corporations to 39.8% among joint-stock companies and 16.5% among limited-liability companies. After adjustment for ownership, scope, scale and vintage, no non-profit form retained an advantage, and the social-welfare corporation estimate reversed (TR = 0.640, 95% CI: 0.480–0.853; Figure 3B); limited companies (有限会社) were associated with shorter survival (0.667, 0.550–0.810; Supplementary Table S6).

3.7 SENSITIVITY ANALYSES

Full results are in Supplementary Note S13, and the estimates for the primary exposure under each alternative specification are summarised in Table 4. The ownership and proximity associations were similar or larger under the wider closure definition (ownership TR = 1.429; within walking distance 1.610; within-corporation HR = 0.570), without the vintage proxy (1.579 and 1.589), among the 6,949 stations with a directly reported corporate number (1.595, 95% CI: 1.251–2.033, and 1.508, 95% CI: 1.217–1.869) and after controlling for organisational archetype (proximity 1.417; Supplementary Tables S7, S10, and S11); service scope, by contrast, lost significance in the last two (1.178, 95% CI: 0.966–1.438, and 1.184, 95% CI: 0.913–1.537). The proximity estimates were larger under the wider definition because exits of stations further from their office were more often followed by a new provider number at the same site (21.2% of their exits, against 13.3% within walking distance), which the primary definition does not count as closures; limiting that rule to new numbers that had appeared by the wave of exit gave 2,303 closures and an intermediate estimate (1.555, 95% CI: 1.296–1.865), so the primary definition is the conservative one. Owners further from their office did not differ significantly from non-owners in any sample, although among the stations with a directly reported number the point estimate was 1.280 (95% CI: 0.944–1.736), against 1.805 (95% CI: 1.409–2.311) for owners within walking distance (Supplementary Table S11). Among the 7,793 stations whose corporation ran two or more service types, ownership kept its association (1.445, 95% CI: 1.210–1.726), but service scope (1.060, 95% CI: 0.829–1.355) and corporate scale (0.984, 95% CI: 0.813–1.192) did not (Supplementary Table S4). The continuous distance association was similar in urban and rural municipalities (TR = 0.893 and 0.911 per log-km; Table 4). In the pooled cohort, provider form was the strongest single predictor (TR = 0.302, 95% CI: 0.269–0.340; Supplementary Table S3). Annual closure rates

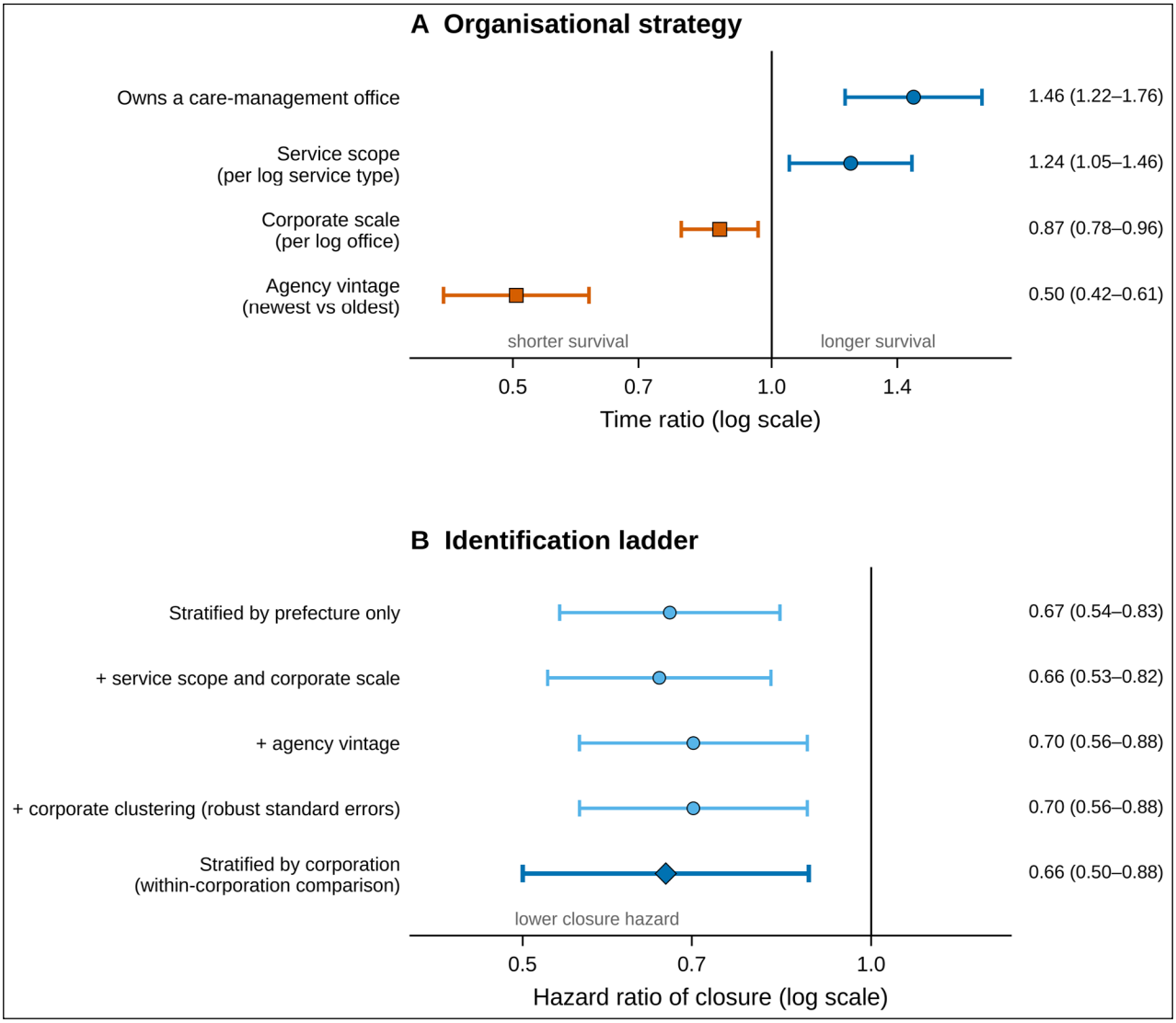

Figure 5 Identification ladder. **(A)** Organisational estimates from the main model (§3.3): time ratios from a Weibull accelerated failure time model with prefecture fixed effects, on 11,778 stations and 2,141 closures; bars are 95% confidence intervals. **(B)** Successive tightening of the identification strategy for the proximity association (§3.5), from prefecture fixed effects alone to a within-corporation comparison. All five rows are estimated on the same subsample of 2,393 stations in 650 corporations with 339 closures, so the comparison is nested, and row 5 is informed by the 366 corporations with stations on both sides of the threshold (245 closures); estimates are hazard ratios with 95% confidence intervals from Cox models, stratified by prefecture in rows 1 to 4 and by corporation in row 5, with model-based standard errors except in row 4, which clusters them on the corporation. A hazard ratio below 1 indicates lower closure hazard for stations within walking distance of their corporation's care-management office. Closure is defined in §2.3.

by interval were 2.6% in the first half-year, and between 3.6% and 4.7% thereafter, so the larger numbers of closures at the last three waves reflect their longer intervals (Supplementary Table S14).

With prefecture and name as the identifier wherever the number was missing, 1,209 stations (10.3%) were classified as non-owners because their corporation's records differed in whether they reported the number. The estimates were then smaller (ownership 1.320, proximity 1.277), but owners further from their office again did not differ significantly from non-owners (1.143, 95% CI: 0.905–1.443; Supplementary Table S19). Among the 8,493 stations whose corporation had a corporate number, 12.8% changed exposure category during follow-up; with time-varying exposures, the HR for proximity among owners was 0.630 (95% CI: 0.535–0.741), against 0.686 with exposures fixed, and owners further from their office then also had a lower hazard than non-owners (0.712, 95% CI: 0.574–0.884; Supplementary Note S20).

The coordinates of station–office pairs registered at the same address were within 53 m of each other in 90% of 2,972 pairs, but 94 (3.2%) were 0.5 km or more apart; treating same-address pairs as co-located gave a TR of 1.469 (95% CI: 1.227–1.760). Simulated positional errors of 25 to 200 m and detour factors of 1.2 to 2.0, including larger factors in rural municipalities, gave estimates between 1.289 and 1.441, significant in every replicate except 1 of the 20 with the largest positional error (Supplementary Note S21). The ownership and proximity

estimates also remained significant in every replicate of the bias analysis, and lost significance when somewhere between 10% and 15% of the comparison group's closures were reclassified as survivors (Supplementary Note S16).

4. DISCUSSION

Broader service scope was associated with longer survival and larger corporate scale with shorter survival, both mainly through the contrast with single-service corporations; pairing with care management was associated with less closure than pairing with other services; and the advantage of owning a care-management office was concentrated among stations within walking distance of it, most of which share its site. Stations that had entered the market more recently were more likely to close.

4.1 SERVICE SCOPE, CORPORATE SCALE, AGENCY AGE, AND LEGAL FORM

A broader service portfolio plausibly lets a corporation retain a client across a chronic illness by referring between services as needs change, a form of demand insurance that single-service operators lack. Running more offices of a similar kind does not add a referral pathway and may dilute managerial attention, which fits the observation that structural elaboration carries its own risk (Hannan and Freeman, 1984). Work on English care homes has found closure more likely where quality is lower and local competition greater (Allan and Forder, 2015), although care homes compete for residents around a fixed asset, whereas home-visit nursing agencies compete for referrals and carry their costs in staff.

Scope and scale correlate at 0.76 on the log scale (variance inflation factors 4.0 and 2.4; condition number 8.3). Entered separately, each keeps its sign, but neither is significant (scope 1.041 alone against 1.235 together; scale 0.921 against 0.870), and the joint model fits better than either. Among corporations of a given size, a broader portfolio is associated with longer survival, so the two coefficients describe the shape of a portfolio jointly. Among corporations running two or more service types, however, neither was associated with closure (Supplementary Table S4), so both associations rest largely on the contrast between single-service corporations and the rest; the scope association was also not significant among stations with a directly reported corporate number or with organisational archetype controlled (§3.7).

Agency vintage was also strongly associated with closure. Because the rank tracks published commencement dates (§2.4), this is best read as an association with agency age: Stations that had operated for a shorter time in December 2020 were more likely to close, consistent with a liability of newness (Freeman, Carroll and Hannan, 1983; Stinchcombe, 1965). The cohort is prevalent, so this describes closure after December 2020 among agencies that had survived to that date, and the validation covers surviving stations only. For policy towards new entrants, it identifies recently established stations as those at greatest risk, although a prevalent cohort cannot show at what age the hazard is highest. Adding designation dates to the open-data release would allow the hazard from entry to be examined directly.

Legal form and local conditions were weak predictors once corporate strategy was accounted for. Non-profit forms such as social-welfare and medical corporations are governed by their own statutes and are taxed differently from companies, but under LTCI every provider is paid from the same fee schedule and regulated by the same standards, and for-profit providers of insured services have been found to behave much like non-profit ones (Suda and Guo, 2011); whatever advantage non-profit status confers did not appear here independently of the service portfolio. Most stations (70.9%) are in municipalities of 100,000 or more residents. In England, higher competition raises the risk of home care agency closure (Allan, 2024); Japan's national fee schedule fixes the price of insured services, so local competition operates on other margins, which may be one reason density does not predict closure here.

4.2 THE COMPOSITION OF A CORPORATION'S SERVICE PORTFOLIO

With provider form fixed, pairing home-visit nursing with care management, the function that assembles and revises a client's care plan (Campbell and Ikegami, 2000; Tsutsui and Muramatsu, 2005), was associated with longer survival than pairing with other services. The comparison is descriptive, since which second service a corporation runs is not exogenous, but it is consistent with evidence that coordination, not merely the availability of services, is associated with outcomes in long-term and chronic care (Baxter *et al*., 2018; Tricco *et al*., 2014).

4.3 INTERPRETING THE PROXIMITY ASSOCIATION

If ownership of a coordinating function were what mattered, the association should not depend on distance. In these data, it does: Owners whose care-management office lay further than 0.5 km away were not detectably different from non-owners in any sample, although their point estimate was higher among stations with a directly reported corporate number (1.280 against 1.144) and they had a lower hazard than non-owners when exposures were updated over time; among owners, proximity to their own office was associated with survival while proximity to another operator's office was not. The benefits of vertical integration have often proved elusive in health care (Burns and Pauly, 2002); here, the association

with integration depends on where the integrated functions sit, as the distinction between organisational and clinical integration would suggest (Valentijn *et al.*, 2013). Most stations within walking distance (90%) were within 50 m of the office or at its street address, so the contrast is in practice largely between sharing a site and not sharing one; the few 50–500 m away at a different street address had a smaller but imprecise estimate, so whether the advantage extends to separate premises cannot be determined (§3.5).

Two readings are possible, with opposite policy implications; a third explanation, confounding by a better-resourced fee category, is discussed in §4.6. The first is coordination: Adjusting a plan as a client's condition changes is easier when the nurse and the care manager work in the same place, and the informal part of that work is harder to carry out at a distance. For a small station, whose viability depends on a steady flow of new clients (Yamaguchi, Yoshimoto and Sugita, 2016), easier coordination could translate into survival by keeping clients whose needs change and by making the station the one a care manager finds easiest to work with. Care managers surveyed about small stations named ease of collaboration and of contact among the qualities they looked for in a nursing station (Zakoji, 2024), and co-location of complementary services is increasingly mapped as a structural marker of integration (Richman, Lombardi and Zerden, 2020). The second is referral steering: Where one corporation employs both the care manager and the nurses, proximity may lower the cost of directing clients to its own service. The fairness and neutrality of care management is an explicit objective of Japanese LTCI policy (MHLW, 2018), the risk that provider-run offices 'enclose' their clients has been debated since the scheme began (Niki, 2000), and steering would produce the same gradient while being worse for clients. The within-corporation design cannot separate the two, because it uses exactly the variation a steering account would invoke, and a steering account also predicts no advantage from a competitor's office.

If steering operated, its advantage should be larger where more competing providers' clients could be captured; coordination carries no such prediction. The data did not show that increase: The advantage was, if anything, smallest where competition was greatest, although the interaction estimates were imprecise. The data therefore provide no support for the one testable prediction that distinguishes steering, but cannot exclude it, and a steering mechanism that operated regardless of local competition would escape these tests.

Under either reading, the relative location of the two functions was associated with survival, which extends the usual focus of spatial-access research on the location of services relative to their users (Chen *et al.*, 2024; Luo and Qi, 2009).

4.4 POLICY IMPLICATIONS

These associations are observational and cannot establish that relocating functions would change outcomes. Read as hypothesis-generating, they bear on policy in three ways.

First, the reading depends on the mechanism, which the data cannot settle. Under coordination, co-locating nursing and care management, for example through shared premises recognised in designation criteria, would be a plausible way to support local capacity, and consolidating ownership without consolidating location would deliver less than the ownership structure suggests. Under steering, encouraging co-location would entrench the advantage of corporations best placed to capture their own referrals. Japan regulates this tension directly: A care-management office is paid less when the plans it writes for a service concentrate clients on a single corporation, but since the 2018 fee revision the rule has applied only to home help, day care and welfare-equipment rental, and home-visit nursing, a medical service whose provider is determined on a physician's instructions, is outside it (MHLW, 2018). The rule sits within a community-based integrated care policy that encourages coordination between services (Morikawa, 2014). Either way, the finding that survival tracks distance is a reason to monitor such rules with spatial data, not ownership data alone.

Second, the geography of net change locates where this matters. Nationally, capacity grew, but growth concentrated in the least aged municipalities, and those left with no provider were small and old. In an expanding market, the closure of an individual agency matters little for access where provision is dense but can remove local provision where it is thin, and in depopulated areas managers describe keeping a station open across wide distances and a shrinking population as a task in its own right (Nanba and Takeu, 2026). Not every exit is a loss, since some remove weak or duplicated provision, but where a closure removes local capacity, it imposes costs on clients and on the public sector (Iqbal *et al.*, 2026).

Third, transfer to other systems depends on which features the mechanism requires: here, a single actor with statutory responsibility for assembling each client's package of services, who may be employed by the same corporation as the provider. Where coordination is purchased separately from provision, as in much of English adult social care, in which local authorities hold a duty to shape care markets (Needham *et al.*, 2023), the analogous question is the distance between a commissioned coordinator and the providers they draw on. Where a system separates the two by rule, as US Medicaid does by barring providers of home and community-based services from providing case management or developing the service plan for the same person unless no other qualified entity is available (Code of Federal Regulations, 2026: Title

42, §441.301(c)(1)(vi)), proximity within a corporation cannot arise, and the question becomes whether separately owned coordinators and providers that sit close together work together better.

4.5 STRENGTHS

The study covers the national population of stations, uses a five-year panel with an observed closure event, distinguishes exits followed by a provider at or near the same site from other closures, checks closures against published facility pages, links corporate records that differ in whether they report the corporate number, examines error in the distance measure directly, and estimates a nested sequence of specifications on a common subsample, from prefecture fixed effects to a within-corporation comparison, together with a placebo on the same scale as the exposure. The agency-vintage proxy is checked against published commencement dates within the cohort.

4.6 LIMITATIONS

Administrative data cannot distinguish why a station closed: Financial failure, merger, succession, and retirement all appear as a disappearance from the data. The classification of exits (§2.3) removes those followed by a provider at or near the same site, but among the remaining closures the reason is unobserved.

Stations receiving no more than 1,000,000 yen in LTCI payments in a year need not report, so a station serving mainly health-insurance clients can disappear from the data while still operating. Such stations are probably less likely to belong to a corporation running care management, which would inflate the ownership estimate, and would inflate the proximity estimate if non-reporting were also more common among owners further from their office. The page check (2 of 146 sampled closures still listed) cannot detect silent non-reporting, and the tipping-point analysis shows that it would have to affect somewhere between 10% and 15% of the comparison group's closures to make either association non-significant, which cannot be excluded with these data. More generally, the share of clients paid by health insurance varies between stations, is unrecorded, and may be correlated with both ownership and proximity, since the care-manager pathway operates only for LTCI clients.

The most consequential gap is staffing, which the files do not record (§2.1). Staffing is associated with the financial performance of home-visit nursing agencies (Fukui *et al.*, 2014; Iida *et al.*, 2019), is the most obvious predictor of survival for a small provider and is plausibly correlated with the exposure, since better-resourced stations are more likely to belong to larger corporations that also run care management. It is the most likely unmeasured confounder and cannot be addressed with these data. In the earlier national panel, provision of care management within the same organisation was not retained once nurse staffing and caseload were modelled (Kashiwagi and Morioka, 2021), so the associations reported here may partly reflect, or work through, staffing and caseload, which these data cannot separate.

For 40.9% of stations, corporate identity rests on the registered name, either linked to a corporate number (13.1%) or alone (27.8%). Among records reporting a number, 98.4% of prefecture–name combinations correspond to a single number, and names that do not were not used for linking (Supplementary Methods S1). Corporations operating across prefectures without a reported number remain split, which can hide a distant office of the same corporation and make owners further away look like non-owners. Restricting to directly identified corporations gave larger ownership and proximity estimates, and in that subsample the point estimate for owners further from their office was higher than in the full cohort without reaching significance (Supplementary Table S11); with time-varying exposures, they had a lower hazard than non-owners. The absence of an advantage beyond walking distance is less secure than the contrast between near and distant owners. Agency age is measured by a proxy validated on surviving stations only, although its weak correlation with distance makes it an unlikely explanation of the proximity result (Supplementary Note S8).

The primary analysis fixes exposures at December 2020, although corporations open and close care-management offices, and one that closes its office may itself be in difficulty. With time-varying exposures, the proximity contrast among owners changed little, while the contrast with non-owners strengthened at both distances and became significant for owners further away (HR = 0.712, 95% CI: 0.574–0.884), as would be expected if corporations in difficulty close the office before the station (Supplementary Note S20); the time-varying estimates are therefore not cleaner than the fixed ones.

Distance is great-circle, not travel time: A national street-network analysis was beyond the resources of this study, and the source does not document how coordinates are assigned. The gap between straight-line and travel distance is larger in mountainous, riverine, and rural areas, so the error is related to urbanicity, and misclassification across a binary threshold can bias in either direction. Within the ranges simulated, neither positional error nor detour removed the association (§3.7), but street-network distances were not computed.

The follow-up period coincides with the coronavirus disease 2019 (COVID-19) pandemic and the panel begins in December 2020, so closure before and after its onset cannot be compared, and the 18.2% closure rate should be read as specific to this period.

The health-insurance fee schedule for home-visit nursing includes higher-paying categories for stations meeting stricter requirements on staffing, client severity,

and end-of-life care (機能強化型 1 and 2), which require a care-management office or a consultation-support office for people with disabilities on the same premises. Co-location is therefore correlated with an unmeasured, better-resourced category of station. The within-corporation comparison removes corporation-level propensity to run such stations, but the two cannot be fully separated, and the proximity estimate is best read as an upper bound on any coordination mechanism. Because most stations within walking distance share a site with the office, as far as addresses show (§3.5), the data cannot separate co-location from membership of these categories, and whether a station belongs to one is not observed.

Finally, stratifying on the corporation does not remove selection within it: A corporation might site a branch expected to need more support near its care-management office. The enhanced-category confounding described above would also produce the threshold pattern, the absence of an association with competitors' offices, and the absence of an interaction with local competition, so these results do not distinguish it from a proximity effect.

4.7 CONCLUSION

In this national cohort, the survival advantage associated with owning a care-management office was concentrated among home-visit nursing stations within walking distance of it, most of which share its site. The data provide no support for the one testable prediction that distinguishes referral steering from coordination, but cannot exclude steering. Either way, the physical siting of coordinating functions, and not only their ownership, is associated with which stations survive, which matters most where provision is thin, in the small, ageing municipalities where growth has been weakest.

DATA ACCESSIBILITY STATEMENT

The original source data are freely available without registration from the Long-Term Care Service Information Disclosure System of the MHLW, at https://www.mhlw.go.jp/stf/kaigo-kouhyou_opendata.html. The dates of commencement used to validate the agency-vintage proxy are published on the facility pages of the same system, at https://www.kaigokensaku.mhlw.go.jp/. The derived analytic dataset and the analysis code are publicly available at Zenodo (https://doi.org/10.5281/zenodo.21357827). The facility-page records used to validate the vintage proxy and to check closures (§2.3, §2.4) were not retained, and the few values that the code reproduces only approximately are listed in the deposit (Supplementary Note S9).

ADDITIONAL FILE

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

- **Supplementary Material.** Supplementary methods, notes and tables S1–S21. DOI: https://doi.org/10.31389/jltc.676.s1

ETHICS AND CONSENT

Ethics approval was not required. This study used only publicly available, facility-level administrative data released as open data by the MHLW, together with dates published on the system's public facility pages. No patient-level or individually identifiable personal information was involved, and no consent was required. Provider organisations are identifiable in the source data; the intended use and limits of the findings are set out in §2.7.

ACKNOWLEDGEMENTS

During the preparation of this work, the author used an artificial intelligence (AI) coding and writing assistant (Claude, Anthropic) to help construct and execute the data-download, corporate-identity-matching, panel-construction and statistical-analysis pipeline described in §2, including the retrieval of published commencement dates, to cross-check reported numerical estimates against the underlying dataset, and to draft manuscript text under the author's direction. After using this tool, the author reviewed, verified, and edited all content, independently confirmed all numerical results against the source data and analysis code, and takes full responsibility for the content of this publication.

FUNDING INFORMATION

This research received no specific grant from any funding agency, commercial entity, or not-for-profit organisation.

COMPETING INTERESTS

The author has no competing interests to declare.

AUTHOR CONTRIBUTIONS

The sole author conceived the study, curated the data, conducted the formal analysis, and wrote the manuscript.

AUTHOR AFFILIATIONS

Hiroyuki Tajima orcid.org/0000-0003-3817-4455
Faculty of Nursing, Shumei University, Japan

REFERENCES

Allan, S. (2024) 'Drivers of home care agency closure: evidence from England', *Journal of Long-Term Care*, (2024), pp. 139–152. Available at: https://doi.org/10.31389/jltc.193

Allan, S. and **Forder, J.** (2015) 'The determinants of care home closure', *Health Economics*, 24(S1), pp. 132–145. Available at: https://doi.org/10.1002/hec.3149

Austin, P.C., Lee, D.S. and **Fine, J.P.** (2016) 'Introduction to the analysis of survival data in the presence of competing risks', *Circulation*, 133(6), pp. 601–609. Available at: https://doi.org/10.1161/CIRCULATIONAHA.115.017719

Bach-Mortensen, A., Goodair, B. and **Degli Esposti, M.** (2024) 'Involuntary closures of for-profit care homes in England by the Care Quality Commission', *The Lancet Healthy Longevity*, 5(4), pp. e297–e302. Available at: https://doi.org/10.1016/S2666-7568(24)00008-4

Baxter, S., Johnson, M., Chambers, D., Sutton, A., Goyder, E. and **Booth, A.** (2018) 'The effects of integrated care: a systematic review of UK and international evidence', *BMC Health Services Research*, 18(1), p. 350. Available at: https://doi.org/10.1186/s12913-018-3161-3

Blondel, V.D., Guillaume, J.-L., Lambiotte, R. and **Lefebvre, E.** (2008) 'Fast unfolding of communities in large networks', *Journal of Statistical Mechanics: Theory and Experiment*, 2008(10), p. P10008. Available at: https://doi.org/10.1088/1742-5468/2008/10/P10008

Burns, L.R. and **Pauly, M.V.** (2002) 'Integrated delivery networks: a detour on the road to integrated health care?', *Health Affairs*, 21(4), pp. 128–143. Available at: https://doi.org/10.1377/hlthaff.21.4.128

Campbell, J.C. and **Ikegami, N.** (2000) 'Long-term care insurance comes to Japan', *Health Affairs*, 19(3), pp. 26–39. Available at: https://doi.org/10.1377/hlthaff.19.3.26

Carroll, G.R. and **Hannan, M.T.** (2000) *The demography of corporations and industries*. Princeton, NJ: Princeton University Press. Available at: https://doi.org/10.1515/9780691186795

Chen, Y.-R., Hanazato, M., Saito, M., Koga, C., Matsuoka, Y., Yoshida, H. and **Kondo, K.** (2024) 'Does the neighborhood built and social environment reduce long-term care costs for Japanese older people? The JAGES2010–2019 cohort study', *Health & Place*, 86, p. 103223. Available at: https://doi.org/10.1016/j.healthplace.2024.103223

Code of Federal Regulations (2026) *Title 42, §441.301: Contents of request for a waiver*. Available at: https://www.ecfr.gov/current/title-42/chapter-IV/subchapter-C/part-441/subpart-G/section-441.301 (Accessed: 27 October 2026).

Cox, D.R. (1972) 'Regression models and life-tables', *Journal of the Royal Statistical Society: Series B (Methodological)*, 34(2), pp. 187–202. Available at: https://doi.org/10.1111/j.2517-6161.1972.tb00899.x

Eklund, K. and **Wilhelmson, K.** (2009) 'Outcomes of coordinated and integrated interventions targeting frail elderly people: a systematic review of randomised controlled trials', *Health & Social Care in the Community*, 17(5), pp. 447–458. Available at: https://doi.org/10.1111/j.1365-2524.2009.00844.x

Fine, J.P. and **Gray, R.J.** (1999) 'A proportional hazards model for the subdistribution of a competing risk', *Journal of the American Statistical Association*, 94(446), pp. 496–509. Available at: https://doi.org/10.1080/01621459.1999.10474144

Freeman, J., Carroll, G.R. and **Hannan, M.T.** (1983) 'The liability of newness: age dependence in organizational death rates', *American Sociological Review*, 48(5), pp. 692–710. Available at: https://doi.org/10.2307/2094928

Fukui, S., Yoshiuchi, K., Fujita, J. and **Ikezaki, S.** (2014) 'Determinants of financial performance of home-visit nursing agencies in Japan', *BMC Health Services Research*, 14, p. 11. Available at: https://doi.org/10.1186/1472-6963-14-11

Guagliardo, M.F. (2004) 'Spatial accessibility of primary care: concepts, methods and challenges', *International Journal of Health Geographics*, 3, p. 3. Available at: https://doi.org/10.1186/1476-072X-3-3

Hannan, M.T. and **Freeman, J.** (1984) 'Structural inertia and organizational change', *American Sociological Review*, 49(2), pp. 149–164. Available at: https://doi.org/10.2307/2095567

Iida, M., Suzuki, M., Shionoya, A., Tuboi, R., Sasaki, K., Osawa, M., Saito, M., Kakinuma, N., Yamazi, S., Kamiyama, T., Kitazume, A., Ushigome, K. and **Yoda, Y.** (2019) 'Financial status of home-visit nursing stations in community-based integrated care systems analyzed in relation to business office characteristics, local community characteristics and business management: comparison between Gunma Prefecture and all prefectures in Japan' [地域包括ケアシステムにおける訪問看護ステーションの経営状況と事業所特性及び地域特性，経営管理との関連－全国と群馬県の比較－]. *Gunma Kenritsu Kenmin Kenko Kagaku Daigaku Kiyo* [群馬県立県民健康科学大学紀要], 14, pp. 19–34 (in Japanese). Available at: https://cir.nii.ac.jp/crid/1050850722278247296 (Accessed: 26 October 2026).

Iqbal, A., Kinghorn, P., Glasby, J., Tanner, D., Allen, K., Zafar, S. and **Roberts, T.** (2026) 'An exploration of the costs of residential care home closures: a mixed method approach', *Journal of Long-Term Care*, (2026), pp. 240–255. Available at: https://doi.org/10.31389/jltc.386

Jung, K. and **Feldman, R.** (2012) 'Public reporting and market area exit decisions by home health agencies', *Medicare & Medicaid Research Review*, 2(4), p. mmrr.002.04.a06. Available at: https://doi.org/10.5600/mmrr.002.04.a06

Kaneda, Y. and **Yamashiro, A.** (2023) 'Addressing nursing shortages in Japan: toward quality and quantity enhancement', *Journal of Public Health and Emergency*, 7, p. 35. Available at: https://doi.org/10.21037/jphe-23-63

Kashiwagi, M. (2024) [Characteristics of home-visit nursing stations that closed in fiscal years 2015–2017: an analysis of panel data from the Long-Term Care Service Information Disclosure System] 2015~2017年度に閉鎖した訪問看護ステーションの特徴：「介護サービス情報公表システム」のパネルデータを用いた分析より. *Community Care* [コミュニティケア], 26(5), pp. 34–37 (in Japanese). Available at: https://cir.nii.ac.jp/crid/1520018677511257344 (Accessed: 26 October 2026).

Kashiwagi, M. and **Morioka, N.** (2021) 'Characteristics of home-visit nursing agencies that closed after the 2012 fee revision for home-visit nursing services: a nationwide panel data analysis in Japan', *International Journal of Environmental Research and Public Health*, 18(18), p. 9820. Available at: https://doi.org/10.3390/ijerph18189820

Kodner, D.L. and **Spreeuwenberg, C.** (2002) 'Integrated care: meaning, logic, applications, and implications – a discussion paper', *International Journal of Integrated Care*, 2(4). Available at: https://doi.org/10.5334/ijic.67

Leutz, W.N. (1999) 'Five laws for integrating medical and social services: lessons from the United States and the United Kingdom', *The Milbank Quarterly*, 77(1), pp. 77–110. Available at: https://doi.org/10.1111/1468-0009.00125

Long-Term Care Insurance Act (1997) *Act No. 123 of 1997* [介護保険法（平成九年法律第百二十三号）]. Available at: https://laws.e-gov.go.jp/law/409AC0000000123 (Accessed: 27 October 2026).

Luo, W. and **Qi, Y.** (2009) 'An enhanced two-step floating catchment area (E2SFCA) method for measuring spatial accessibility to primary care physicians', *Health & Place*, 15(4), pp. 1100–1107. Available at: https://doi.org/10.1016/j.healthplace.2009.06.002

MHLW (Ministry of Health, Labour and Welfare) (2018) *Revisions to each service in the fiscal year 2018 long-term care fee revision* [平成30年度介護報酬改定における各サービス毎の改定事項について]. Reference Material 1, 158th meeting of the Subcommittee on Long-Term Care Benefit Costs, Social Security Council, 26 January 2018. Available at: https://www.mhlw.go.jp/file/05-Shingikai-12601000-Seisakutoukatsukan-Sanjikanshitsu_Shakaihoshoutantou/0000192302.pdf (Accessed: 21 September 2026).

MHLW (Ministry of Health, Labour and Welfare) (2025) *On certification of need for long-term care* [要介護認定について]. Material 4, 122nd meeting of the Long-Term Care Insurance Subcommittee, Social Security Council, 30 June 2025. Available at: https://www.mhlw.go.jp/content/12300000/001510551.pdf (Accessed: 21 September 2026).

Morikawa, M. (2014) 'Towards community-based integrated care: trends and issues in Japan's long-term care policy', *International Journal of Integrated Care*, 14(1). Available at: https://doi.org/10.5334/ijic.1066

Nanba, T. and **Takeu, R.** (2026) 'Strategies for sustainable operations considered by managers of home-visit nursing stations: a case study of depopulated areas of Hokkaido' [訪問看護ステーションの管理者が考える継続的な運営に向けた方略：北海道の過疎地域に焦点を当てて]. *Kango Sogo Kagaku Kenkyukai Shi* [看護総合科学研究会誌], 22(1), pp. 3–20 (in Japanese). Available at: https://doi.org/10.14943/2115.99259

Needham, C., Allen, K., Burn, E., Hall, K., Mangan, C., Al-Janabi, H., Tahir, W., Carr, S., Glasby, J., Henwood, M. and **McKay, S.** (2023) 'How do you shape a market? Explaining local state practices in adult social care', *Journal of Social Policy*, 52(3), pp. 640–660. Available at: https://doi.org/10.1017/S0047279421000805

Niki, R. (2000) ['Considering the 'fairness and neutrality' of care-management providers and the 'enclosure' of users'] 居宅介護支援事業者の「公正中立」と利用者「囲い込み」を考える. *Gekkan Kea Manejimento* [月刊ケアマネジメント], 11(2), pp. 10–12 (in Japanese). Available at: https://cir.nii.ac.jp/crid/1524232505022535424 (Accessed: 26 October 2026).

Ordinance for Enforcement of the Long-Term Care Insurance Act (1999) *Ordinance of the Ministry of Health and Welfare No. 36 of 1999* [介護保険法施行規則（平成十一年厚生省令第三十六号）]. Available at: https://laws.e-gov.go.jp/law/411M50000100036 (Accessed: 27 October 2026).

Penchansky, R. and **Thomas, J.W.** (1981) 'The concept of access: definition and relationship to consumer satisfaction', *Medical Care*, 19(2), pp. 127–140. Available at: https://doi.org/10.1097/00005650-198102000-00001

Richman, E.L., Lombardi, B.M. and **Zerden, L.D.** (2020) 'Mapping colocation: using national provider identified data to assess primary care and behavioral health colocation', *Families, Systems, & Health*, 38(1), pp. 16–23. Available at: https://doi.org/10.1037/fsh0000465

Singh, J.V., Tucker, D.J. and **House, R.J.** (1986) 'Organizational legitimacy and the liability of newness', *Administrative Science Quarterly*, 31(2), pp. 171–193. Available at: https://doi.org/10.2307/2392787

Stinchcombe, A.L. (1965) 'Social structure and organizations', in J.G. March (ed.) *Handbook of organizations*. Chicago: Rand McNally, pp. 142–193.

Suda, Y. and **Guo, B.** (2011) 'Dynamics between nonprofit and for-profit providers operating under the long-term care insurance system in Japan', *Nonprofit and Voluntary Sector Quarterly*, 40(1), pp. 79–106. Available at: https://doi.org/10.1177/0899764009350225

Tamiya, N., Noguchi, H., Nishi, A., Reich, M.R., Ikegami, N., Hashimoto, H., Shibuya, K., Kawachi, I. and **Campbell, J.C.** (2011) 'Population ageing and wellbeing: lessons from Japan's long-term care insurance policy', *The Lancet*, 378(9797), pp. 1183–1192. Available at: https://doi.org/10.1016/S0140-6736(11)61176-8

Tricco, A.C., Antony, J., Ivers, N.M., Ashoor, H.M., Khan, P.A., Blondal, E., Ghassemi, M., MacDonald, H., Chen, M.H., Ezer, L.K. and **Straus, S.E.** (2014) 'Effectiveness of quality improvement strategies for coordination of care to reduce use of health care services: a systematic review and meta-analysis', *CMAJ*, 186(15), pp. E568–E578. Available at: https://doi.org/10.1503/cmaj.140289

Tsutsui, T. and **Muramatsu, N.** (2005) 'Care-needs certification in the long-term care insurance system of Japan', *Journal of the American Geriatrics Society*, 53(3), pp. 522–527. Available at: https://doi.org/10.1111/j.1532-5415.2005.53175.x

Valentijn, P.P., Schepman, S.M., Opheij, W. and **Bruijnzeels, M.A.** (2013) 'Understanding integrated care: a comprehensive conceptual framework based on the integrative functions of primary care', *International Journal of Integrated Care*, 13(1). Available at: https://doi.org/10.5334/ijic.886

von Elm, E., Altman, D.G., Egger, M., Pocock, S.J., Gøtzsche, P.C. and **Vandenbroucke, J.P.** (2007) 'The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies', *The Lancet*, 370(9596), pp. 1453–1457. Available at: https://doi.org/10.1016/S0140-6736(07)61602-X

Wang, F. (2012) 'Measurement, optimization, and impact of health care accessibility: a methodological review', *Annals of the Association of American Geographers*, 102(5), pp. 1104–1112. Available at: https://doi.org/10.1080/00045608.2012.657146

Yamaguchi, K., Yoshimoto, T. and **Sugita, Y.** (2016) 'The preparation of tentative indices of business management behavior for managers of visiting nursing stations: to achieve qualitative and quantitative fulfillment of home care needs in the community based on stable business management' [訪問看護ステーション管理者の経営管理行動指標試案の作成：安定的経営に基づく地域の在宅ケアニーズの量的・質的充足に向けて]. *Journal of Graduate School of Nursing, Chiba University*, 38, pp. 47–55 (in Japanese). Available at: https://cir.nii.ac.jp/crid/1050851497138852864 (Accessed: 26 October 2026).

You, E.C., Dunt, D., Doyle, C. and **Hsueh, A.** (2012) 'Effects of case management in community aged care on client and carer outcomes: a systematic review of randomized trials and comparative observational studies', *BMC Health Services Research*, 12, p. 395. Available at: https://doi.org/10.1186/1472-6963-12-395

Zafar, S., Taylor, B. and **Glasby, J.** (2026) 'Leading in a vacuum? – Social care leaders' experiences of care home closures in England', *Journal of Long-Term Care*, (2026), pp. 268–281. Available at: https://doi.org/10.31389/jltc.643

Zakoji, Y. (2024) 'A study on competitive strategy of small-scale home-visit nursing stations: a questionnaire survey of care managers' [小規模訪問看護ステーションの競争戦略に関する一考察：ケアマネジャーへのアンケート調査より]. *Journal of Japanese Association for Health Care Administrators*, 18(1), pp. 15–25 (in Japanese). Available at: https://doi.org/10.11202/jaha.18.15

TO CITE THIS ARTICLE:
Tajima, H. 2026. Care-Management Proximity and the Survival of Home-Visit Nursing Agencies in Japan, 2020–2025: A National Cohort Study. *Journal of Long-Term Care*, (2026), pp. 427–448. DOI: https://doi.org/10.31389/jltc.676

Submitted: 14 July 2026 **Accepted:** 10 November 2026 **Published:** 27 November 2026

COPYRIGHT:
© 2026 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (CC BY-NC-ND 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See https://creativecommons.org/licenses/by-nc-nd/4.0/.

Journal of Long-Term Care is a peer-reviewed open access journal published by LSE Press.