Rates of nursing home closures were relatively stable over the past decade, but warrant continuous monitoring

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Abstract

For years, nursing home closures have been a concern for the industry, policymakers, consumer advocates, and other stakeholders. We analyzed data from 2011 through 2021 and did not find persistent increases in the closure rates. Closures were relatively stable from 2011 to 2017, averaging 118 facilities (0.79%) per year and increasing to 143 (0.96%) in 2018 and 200 (1.34%) in 2019. Closures decreased during the COVID-19 pandemic, averaging 133 facilities in 2020 and 2021 (0.90%). Medicaid-only nursing facilities had higher closure rates than Medicare-only skilled-nursing facilities and dually certified nursing homes. The Census regions (divisions) of the South (West South Central) and Northeast (New England) had the highest closure rates, while the South (South Atlantic and East South Central) had the lowest rates. Facility characteristics associated with increased closure risk included smaller size, lower occupancy rate, urban location, no ownership changes, lower inspection survey ratings, higher staffing ratings, higher percentages of non-White residents and Medicaid residents, lower percentages of Medicare residents and residents with severe acuity, and location in states with more nursing home alternatives. Additional research should examine the impact of closures on resident outcomes and access to care.

Key words: nursing homes; nursing home closures; long-term care.

Introduction

Nursing home closures have been a growing concern among health care providers, policymakers, and other stakeholders due to their potential adverse impacts on residents. As a result of closure, residents may experience disruption in care or stress and trauma from relocation.[1] Furthermore, residents in closed facilities may face immediate issues accessing long-term care. For example, following the closure of a facility in a rural area, residents may have to move long distances to find another facility or seek alternative arrangements.[2] Nursing home closures may also increase disparities in access to care if closures are clustered in certain geographical areas or disproportionately among facilities with low-income and minority residents.[3] These access issues could become more pressing and widespread in upcoming years due to the increase in the older population in the United States. In the next decade, the population aged 75 years and over is predicted to grow by almost 40%, with the 80–84-year age group alone growing 55%.[4] While nursing home alternatives may partially meet increased demand, nursing homes will continue to be needed for older adults with complex care needs and conditions such as dementia.[4]

Most previous studies on nursing home closures, defined as termination from the Medicare and Medicaid programs, were based on data prior to 2009.[3,5,6] These studies identified facility- and market-level factors associated with closures, including low bed counts,[5,6] low occupancy rates,[5,6] more deficiency citations,[5,6] and lower Medicaid reimbursement.[5,6] They also found wide geographical variation in closures, including concentrations in areas with higher percentages of minorities and higher poverty rates.[3]

In recent years, stakeholders have expressed concern about a potential rise in nursing home closures, based on anecdotal evidence.[1] News reports have highlighted potential reasons for closure identified in previous research, such as low Medicaid reimbursement levels and low occupancy rates, but also staffing difficulties and increased market competition.[2,7] However, analyses of nursing home closure post-2009 are limited and vary in the method used to identify closures and contributing factors. One study, based on 2015–2019 Nursing Home Compare data, indicated a rise in closures over the time frame, with concentrations in certain states.[4] Another study, based on 2008–2018 Provider of Service (POS) data, identified characteristics of closed facilities such as lower occupancy rate and fewer beds.[8] Another, dataset (unknown) identified characteristics of closure such as fewer beds and urban location.[9] However, little is known about whether closure rates over the past decade differ from the earlier period or whether additional factors are related to closures. Furthermore, it is unclear how closure rates have been impacted by recent trends in the nursing home industry. Over the past decade, the shift of long-term care from nursing

homes to home- and community-based services (HCBS) has accelerated, and Medicaid dollars have been reallocated accordingly.[10] There are known disparities in access to HCBS between rural and urban areas.[11,12] More recently, the COVID-19 pandemic has imposed a significant financial burden on nursing homes, and many facilities have expressed uncertainty about their ability to stay open.[13] It is unknown whether these events have contributed to closures.

A comprehensive understanding of nursing home closures and risk factors for closures is both timely and vital for policymakers to address these concerns. In this study, we examine the prevalence of closures from 2011 through 2021 using POS data and trends in closures by state and facility characteristics. Our study identifies closures from the full past decade, including recent years during the COVID-19 pandemic. We include additional datasets and a broader set of characteristics, including supply measures of HCBS as nursing home alternatives, to more comprehensively examine factors associated with closure.

Data and methods

Study population

We used Medicare POS data from 2011 through 2021 to obtain yearly information on nursing homes, including start and termination dates, geographic location, provider type, and hospital-based status. Our study population included all nursing homes in the United States. We distinguished 3 types of nursing homes: (1) skilled nursing facilities (SNFs) only (SNFs-only), serving primarily Medicare beneficiaries who need short-term, post-acute rehabilitation, and other medical and nursing care; (2) nursing facilities (NFs) only (NFs-only), serving longer-term residents with personal and custodial care needs; and (3) facilities dually certified as both SNFs and NFs (SNFs/NFs). We excluded hospital-based facilities due to significant differences in business practices that could have unique effects on closures. We defined a facility as a new entry during the study period if the earliest certification date was in 2011 or later. Our final sample included 16 361 unique facilities from 2011 through 2021, of which 671 (4.1%) were SNFs-only, 570 (3.5%) were NFs-only, and 15 120 (92.4%) were dually certified SNFs/NFs.

Outcome variable: closure

Closures were identified using POS data and captured all documented terminations from the Medicare and Medicaid programs, whether voluntary or involuntary. Facilities may continue operations without certification or under a different identification, as discussed in the Limitations section. We created a closure outcome variable equal to 1 if a facility closed in a given year and zero if still active at the end of the year. We first identified nursing homes with both a termination date and termination code. The POS termination code does not allow us to distinguish between mergers and acquisitions and voluntary closures, as discussed further in the Limitations section. We then used the presence of subsequent certification surveys to determine if these nursing homes were permanently closed. If a survey occurred within 18 months of the termination date, as required to assess compliance with federal regulations, the nursing home was determined to be still active. If no survey occurred within 18 months, the nursing home was determined to be closed in the year of the termination date.

We identified additional closures, in the absence of termination date and termination code combinations, through lapses in certification surveys. Specifically, if more than 5 years had passed between the nursing home's last certification survey and the end of the study period (December 2021), the nursing home was considered closed in the year of the last certification survey. This was a rare occurrence as we found most closures had both a termination date and code combination.

Independent variables

In our statistical analysis, we examined facility and market characteristics. Facility characteristics were obtained from POS, including profit status and changes in ownership, and LTCFocus data,[14,15] including occupancy rates and aggregated resident characteristics. We obtained facility quality information from Nursing Home Compare (now the Provider Data Catalog). Characteristics from these datasets were selected from the year of closure or the year of the most recent certification survey for active facilities. If the facility had no information on a characteristic in that year, we used up to a 2-year lookback in the data for a value for the characteristic. The number of facilities for which we had to look up information varied by dataset and characteristics. For most characteristics, we looked up data for fewer than 500 facilities. However, some characteristics were last available in 2018, and thus all facilities active after 2018 required a 1-year lookup.

Last, we used the National Study of Long-Term Care Providers to obtain state-level information about nursing home alternatives such as adult day service centers, home health agencies, and residential care communities. The survey was conducted biennially and publicly available from 2012–2016.[16] If a state had no information for a provider type on a given survey, we selected the value from a prior survey when possible. For each facility, we selected the value from the nearest survey during or prior to the year of closure or from the 2016 survey for active facilities. These characteristics were standardized as provider counts per 1000 individuals age 65+ years in the state, using population data in that same year from the American Community Survey.

Statistical analysis

We used descriptive statistical analyses to first examine trends and patterns of nursing home closures from 2011 through 2021, both nationally and disaggregated by state and by facility characteristics such as provider type. We then conducted a multivariate logistic regression analysis to identify factors associated with closures. To isolate the factors that have generally affected nursing home closures over the past decade, our multivariate regression analysis intentionally focused on the time period before the COVID-19 pandemic, excluding 2020 and 2021, which may have unique factors associated with closures. The logistic regression model covariates include facility and resident characteristics and were selected based on conceptual relevance, data integrity, and correlation with other characteristics. Excluding cases with missing data on certain covariates, our regression analysis included 13 845 facilities, of which 653 were closures and 13 192 were active facilities.

Limitations

This study has some limitations. First, our closure definition includes terminations resulting from mergers and

acquisitions, even though these facilities may continue to operate without Medicare and Medicaid participation (thereafter no longer captured in the POS file) or under a different identification. We cannot distinguish these terminations because the POS termination code combines mergers and acquisitions and voluntary closures into a single category. We compared the dates of ownership changes in POS with the termination dates, and generally did not find that ownership changes occurred in close temporal proximity to terminations. Most ownership changes are observed without termination. It is unclear whether this finding indicates low levels of mergers or acquisitions misclassified as closures or whether ownership changes, as defined in these data, exclude changes resulting in termination. We looked for more insight in the Medicare Provider Enrollment, Chain, and Ownership System data, but found no records of acquisitions and mergers, which raised concerns about how the data are collected.

Second, for facilities active as of 2017, we cannot look forward 5 years to identify additional closures based on lapses in surveys. This limitation will not impact findings as closures are rarely identified using this method, with 16 out of 834 closures identified this way from 2011–2017.

Third, we cannot determine the reason for a particular nursing home's closure or assess the appropriateness of closures. Some closures are to be expected for reasons such as poor performance or oversupply in the local long-term-care market.

Last, closures during the COVID-19 pandemic years may have been driven by different factors than closures occurring prior to the COVID-19 pandemic. In this article, 2020 and 2021 are included in the descriptive trend analysis but intentionally not included in the multivariate analysis to identify broader factors associated with closures in the absence of unusual events such as the COVID-19 pandemic. Further research should examine whether factors associated with closures in 2020 and 2021 differ from factors associated with closures from 2011 to 2019. Future research should also examine the association between closures and COVID-19–specific factors, such as the number of COVID-19 cases in a facility.
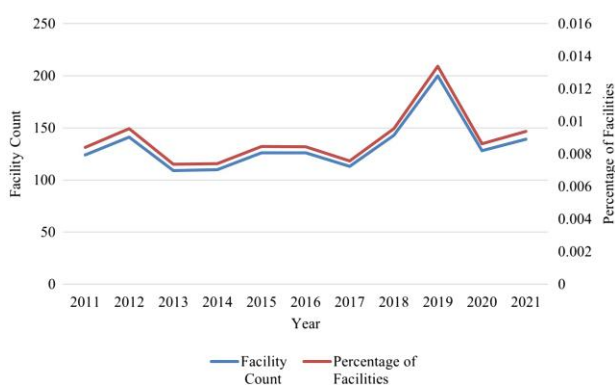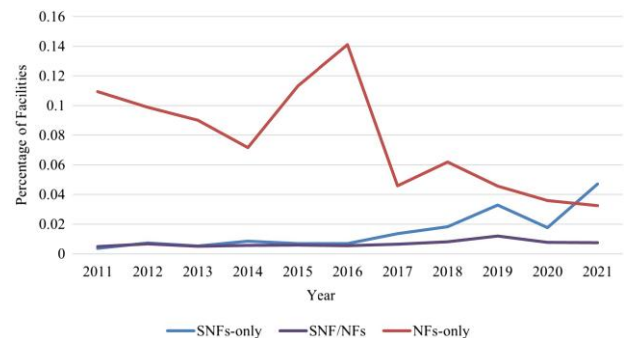
Results

Closures over the past decade

From 2011 to 2021, there were 1459 closures, constituting 8.92% of all nursing homes in our study. Figure 1 shows the number (on the left vertical axis) and percentage (on the right vertical axis) of closures by year. With the exception of 2012, closures from 2011–2017 remained relatively low and stable, averaging 118 facilities or 0.79% of all facilities each year. There was a small peak in 2012 with 141 closures (0.95% of all facilities). Closures then increased to 143 facilities (0.96%) in 2018 and peaked at 200 facilities (1.34%) in 2019. Closures decreased again during the pandemic years of 2020 and 2021, averaging 133 facilities (0.90%).
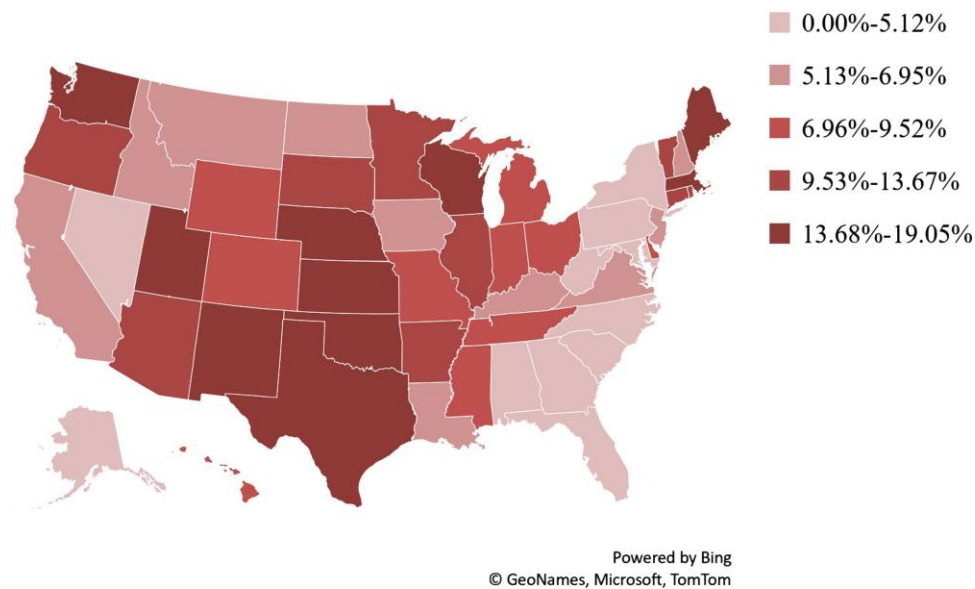
Closures by provider type

Figure 2 displays closure rates (percentages) by provider type. The rates of closures of SNFs-only and SNFs/NFs increased from 2011 to 2021 but were relatively small at less than 1% before 2017. SNFs-only and SNFs/NFs had peaks in closure rates in 2019, at 3.29% and 1.20%, respectively, paralleling overall closure trends. SNFs-only had an additional increase in closures in 2021 to 4.71%. The rates of closure among NFs-only decreased from 2011 to 2021, with the exception of an increase from 2014 to 2016. However, the closure rates among NFs-only was much higher than that among SNFs/NFs and SNFs-only, ranging from 3.25% in 2021 to 14.11% in 2016.

Closures by state

Nationwide, from 2011 through 2021, there was an average of 29 closures or 8.79% of all facilities per state (Figure 3). The highest closure rates were found in the following Census regions (divisions): West (all divisions), Midwest (all divisions), South (West South Central), and Northeast (New England). Many states in these divisions had more than 10% of facilities closed, with the highest rates in New Mexico (19.05%), Wisconsin (17.03%), and Nebraska (16.17%). The lowest closure rates were found in the Northeast (Middle Atlantic) and South (South Atlantic and East South Central) regions. Many states in these divisions

Figure 1. Trends in nursing home closures, facility counts, and percentages: 2011–2021. This figure presents closures of all nursing homes in the United States across provider types. The percentage reflects the number of closures out of all nursing homes operating at any point in the year. Abbreviation: POS, Provider of Service. Source: Authors' analysis of POS data for the period 2011–2021.

Figure 2. Trends in nursing home closure rates by provider type, percentages: 2011–2021. This figure presents closures of all nursing homes in the United States of a given provider type. The percentage for each provider type is the number of closures out of all facilities of that provider type operating at any point in the year. Abbreviations: NFs, nursing facilities; POS, Provider of Service; SNFs, skilled nursing facilities. Source: Authors' analysis of POS data for the period 2011–2021.

Figure 3. Nursing home closures by state, percentages: 2011–2021. This figure presents closures of all nursing homes in the United States, by state, across provider types from 2011–2019. The percentage in each state is the number of closures in that state out of all unique facilities operating in that state at any point from 2011–2019. Abbreviation: POS, Provider of Service. Source: Authors' analysis of POS data for the period 2011–2021.

had fewer than 5% of facilities closed, with the lowest closure rates in West Virginia (1.77%) and North Carolina (2.55%).

Factors related to closures

Table 1 shows results of multivariate regression analyses examining the factors associated with closures from 2011–2019. An odds ratio (OR) of less than 1 indicates a lower likelihood of closure, relative to the reference group, while an OR greater than 1 indicates a higher likelihood of closure.

We identified several facility and market characteristics that increased the likelihood of closure, after adjusting for other factors. Urban facilities were more likely to close than rural facilities (OR = 1.298; $P < .05$). Facilities with higher percentages of non-White residents and Medicaid residents (second through fourth quartiles) and the highest percentages of residents with cognitive impairment (fourth quartile) were more likely to close than facilities with the lowest percentages of these residents (first quartile) ($P < .01$). Last, facilities in states with the most adult day service centers, home health providers, and other nursing homes (fourth quartile) were more likely to close than facilities in states with the fewest of these providers (first quartile) (OR = 1.769, OR = 2.868, and OR = 2.262, respectively; $P < .001$ for all).

Likewise, several facility characteristics decreased the likelihood of closure. Any ownership changes over the facility's existence, higher percentages of residents with severe acuity and with Medicare as the primary payer, larger facility size (more certified beds), and higher occupancy rate also decreased the likelihood of closure ($P < .001$ for all).

The relationship between quality and closure varied by Centers for Medicare & Medicaid Services (CMS) star rating. Facilities with the highest inspection survey ratings (indicating fewest deficiencies) were less likely to close than facilities with the lowest rating ($P < .001$). For staffing ratings, facilities with 2-star ratings were less likely to close and facilities with the highest ratings (4 and 5 stars) were more likely to close, relative to facilities with 1 star ($P < .001$).

Discussion

Nursing home closures in the past decade

Our study found relatively stable rates of nursing home closures over the past decade. We identified 1459 closures (9% of all facilities) from 2011 through 2021. Closures were relatively stable from 2011 to 2017, except for a small peak in 2012. Closures then increased in 2018 and 2019. This finding is consistent with another study, which also found increases in closures in 2018 and 2019.[4] Our study extended prior research by also examining the pandemic years of 2020 and 2021 and found decreases in closures in these years to rates comparable to pre-2018. Thus, because of the COVID-19 pandemic and resulting disruption in the nursing home market, it is unclear whether the increases in closures in 2018 and 2019 were isolated or reflected the beginning of a more sustained trend.

Unique events, such as refinement of the nursing home payment system, coincide with some of the observed pattern of closures over the past decade. The peak in closures in 2012 corresponds to the implementation of the 2011 SNF Prospective Payment System (PPS) refinement from Resource Utilization Groups (RUG)-III to RUG-IV, which decreased Medicare payments in fiscal year 2012 by 11.1%. While causation cannot be determined, there was uncertainty around the financial consequences of the PPS refinement during that time. Similarly, increases in closures in 2018 and 2019 occurred at the same time as the new Patient-Driven Payment Model SNF payment system, which was finalized in 2018 and implemented in October 2019. The increases may also be partially attributed to increases in mergers and acquisitions in these years,[17] which cannot be confirmed in this study due to data limitations that do not allow us to distinguish mergers and acquisitions from voluntary closures. Last, the decrease in closures in 2020 and 2021, relative to 2018 and 2019, indicates that there has not been a substantial increase in closures during the pandemic years so far. One reason that closures did not spike may be that federal and state funding

Table 1. Multivariate regression results displaying likelihood of closure by facility and market characteristic.

Characteristic	Percentage of facilities with characteristic	Odds ratio	P
Urban-rural indicator (reference: rural)	27.71		
Urban	72.29	1.298[a]	.012
Chain affiliation (reference: non-chain)	40.72		
Chain	59.28	0.951	.594
Change in ownership count (reference: 0 changes)	35.77		
1–2 changes	36.38	0.784[a]	.028
>2 changes	27.84	0.655[b]	.001
Profit status (reference: for-profit)	72.52		
Nonprofit	21.92	0.854	.218
Government	5.56	0.845	.376
Health inspections rating (reference: 1 star)	21.83		
2 stars	24.55	0.482[c]	<.001
3 stars	22.84	0.498[c]	<.001
4 stars	21.85	0.351[c]	<.001
5 stars	8.93	0.306[c]	<.001
Quality measures rating (reference: 1 star)	6.71		
2 stars	15.19	0.840	.320
3 stars	21.45	1.092	.594
4 stars	25.59	1.048	.779
5 stars	31.06	1.288	.133
Staffing rating (reference: 1 star)	14.75		
2 stars	25.02	0.525[c]	<.001
3 stars	29.01	0.902	.452
4 stars	22.30	1.946[c]	<.001
5 stars	8.92	1.807[b]	.001
Acuity index in quartiles (reference: first quartile)	25.02		
Second quartile	24.99	0.586[c]	<.001
Third quartile	24.99	0.518[c]	<.001
Fourth quartile (highest)	25.00	0.626[c]	<.001
Non-White in quartiles (reference: first quartile)	25.08		
Second quartile	24.93	1.464[b]	.003
Third quartile	25.03	1.478[b]	.005
Fourth quartile (highest)	24.97	1.578[b]	.003
Medium or high cognitive impairment (Cognitive Function Scale) in quartiles (reference: first quartile)	25.23		
Second quartile	24.80	0.907	.423
Third quartile	25.06	0.882	.321
Fourth quartile (highest)	24.92	1.430[b]	.004
Medicaid in quartiles (reference: first quartile)	25.03		
Second quartile	24.98	1.531[b]	.005
Third quartile	24.99	2.073[c]	<.001
Fourth quartile (highest)	24.99	2.926[c]	<.001
Medicare in quartiles (reference: first quartile)	25.01		
Second quartile	25.08	0.654[c]	<.001
Third quartile	25.01	0.554[c]	<.001
Fourth quartile (highest)	24.90	0.601[b]	.001
Certified bed count in quartiles (reference: first quartile)	25.50		
Second quartile	24.98	0.520[c]	<.001
Third quartile	24.82	0.325[c]	<.001
Fourth quartile (highest)	24.69	0.309[c]	<.001
Occupancy rate in quartiles (reference: first quartile)	25.03		
Second quartile	24.98	0.447[c]	<.001
Third quartile	25.00	0.263[c]	<.001
Fourth quartile (highest)	24.99	0.271[c]	<.001
Adult day service center provider count per 1000 population aged 65+ years in quartiles (reference: first quartile)	26.92		
Second quartile	23.20	0.533[c]	<.001
Third quartile	26.28	0.750[b]	.053
Fourth quartile (highest)	23.60	1.769[c]	<.001
Home health provider count per 1000 population aged 65+ years in quartiles (reference: first quartile)	25.64		
Second quartile	28.74	0.427[c]	<.001
Third quartile	23.30	0.575[c]	<.001
Fourth quartile (highest)	22.32	2.868[c]	<.001
Residential care communities provider count per 1000 population aged 65+ years in quartiles (reference: first quartile)	25.97		
Second quartile	25.06	0.282[c]	<.001

(continued)

Table 1. Continued

Characteristic	Percentage of facilities with characteristic	Odds ratio	P
Third quartile	24.18	1.160	.349
Fourth quartile (highest)	24.79	0.770	.101
Nursing home provider count per 1000 population aged 65+ years in quartiles (reference: first quartile)	27.61		
Second quartile	28.46	0.817	.236
Third quartile	21.03	1.521[b]	.007
Fourth quartile (highest)	22.91	2.262[c]	<.001

Source: Authors' analysis of Provider of Service (POS), LTCFocus, Nursing Home Compare, and National Study of Long-Term Care Providers (NSLTCP) data for the period 2011–2019. n = 13 845 facilities. R^2 = 0.1875.
[a]$P < .05$.
[b]$P < .01$.
[c]$P < .001$.

bolstered nursing home finances during the pandemic and mitigated the risk of closure.[13] The impact of the pandemic on closures should continue to be monitored as pandemic-related supplemental funding ends and additional years of data become available.

Finally, we compared closure rates over the past decade with closure rates in the prior decade to determine if there was an overall increase in closures. A prior study using a similar method of identifying closures found 1776 closures from 1999–2008, or 11% of all facilities, which is over 300 more closures than found from 2011–2021.[3] Furthermore, the highest closure rates in this study were similar to or below the average closure rate of the preceding decade. From 2011 through 2021, only one year, 2019, had a closure rate above 1%. In contrast, most years from 1999–2008 had closure rates above 1%. Thus, closure rates as a whole over the past decade have decreased compared with the preceding decade.

Closures by state

Closures were not evenly distributed across the United States, which may have implications for access to care. Closures were highest in the Midwest (West South Central) and Northeast (New England) Census regions and lowest in the South (South Atlantic and East South Central) regions. Overall, there was a wide range in closure rates from 0.0% in Alaska to 19.0% in New Mexico, and longitudinal trends in closures by state should be examined. While we did not find a sustained nationwide increase in closures over the past decade, there may be certain states with increases in closures. Furthermore, residents in states with higher closure rates may face greater barriers to nursing home access in the future. However, these findings should be examined further in the context of the state-level growth of the older adult population and availability of nursing home alternatives.

Closures by provider type

Closure rates varied by certification status, which may be partially explained by underlying differences in reimbursement levels. We found higher closure rates among NFs-only than SNFs-only and SNFs/NFs. NFs-only rely heavily on lower Medicaid payments rather than higher Medicare payment. In contrast, SNFs-only and SNFs/NFs also receive higher Medicare payments and thus may be more financially stable. We saw a relatively large increase in closures of NFs-only

from 2014 to 2016. We could not pinpoint any unique event that may explain the increase during these years. NFs-only may be more impacted by decreased demand for nursing home care from the shift from institutional care to HCBS. However, closures of NFs-only have decreased recently, approaching the rates of SNFs-only and SNFs/NFs. This downward trend should be examined further. Furthermore, while closure trends among SNFs-only and SNFs/NFs generally follow overall closure trends, we did observe a relatively large increase in closures of SNFs-only between 2020 and 2021. This increase should also be examined further.

Other factors associated with closure

We identified several facility characteristics as risk factors for closure. First, smaller facilities and those with lower occupancy rates were both more likely to close. One explanation is that, relative to larger facilities, smaller facilities may have fewer resources and less ability to internally restructure, making them more vulnerable to market disruptions.[5] Similarly, facilities with lower occupancy rates may have a lower revenue flow and smaller market share. Size and occupancy rate were consistently identified in the literature as risk factors for closure, both in studies examining pre-2010 data[5,6] and a recent study examining 2008–2018 data.[8]

Second, urban facilities were more likely to close than rural facilities. This may be the result of market factors specific to urban areas, such as increased competition from other nursing homes or nursing home alternatives. However, this finding differs from that of prior studies, which found equivalent closure rates in urban and rural areas.[3] Furthermore, a study of recent data found several states with closures concentrated in rural areas.[4] While urban location is a risk factor for closure at the national level, this risk factor may need further examination to determine whether it varies across states. Furthermore, the percentage of rural facilities closed overall is relatively high due to the small number of rural facilities.

Additionally, facilities with worse quality, as measured by inspection surveys, were more likely to close. These facilities may be subject to additional and higher fines and involuntary closures. This finding is supported by prior research, which found that higher counts of deficiency citations were a risk factor for closure.[5,6] The closure of these poor-performing facilities may be considered positive as the continuation of these facilities diminishes the overall quality of the nursing home market.

However, we also found increased closure risk among facilities with higher staffing rating, which is typically considered beneficial for patients. Relative to facilities with the lowest rating (1 star), facilities with slightly higher ratings (2 stars) were less likely to close, but facilities with the highest ratings (4 or 5 stars) were more likely to close. This finding may reflect the financial burden of maintaining the highest levels of staffing. However, these facilities may also receive higher ratings on quality of care due to higher staffing levels.

Last, we found that facilities with no ownership changes are more likely to close. This finding differs from prior research that found ownership changes increased the likelihood of closure.[5] It may be that the facilities with no ownership changes are newer and thus less financially stable. We found that facilities with no ownership change had a more recent starting year (and thus were newer), based on original participation date in POS, on average, than those with ownership changes. Additionally, facilities that are more likely to close may have had inherent weaknesses that also made them unattractive to buyers.

We also found several aggregated resident characteristics that were associated with closure. Facilities with a higher percentage of non-White residents were more likely to close than facilities with lower percentages of these residents. This finding is supported by a prior study, which found higher closure rates from 1998–2008 in zip codes with higher percentages of Black and Hispanic populations.[3] Our research indicates that closures continue to disproportionately impact minority populations.

Several risk factors provide insight into the impact of policy factors on closures. A higher percentage of Medicaid residents, who receive lower reimbursement than Medicare or private pay residents, increased the likelihood of closures. In contrast, a higher percentage of residents with severe acuity decreased the likelihood of closure, which may be because Medicaid reimburses more for residents with higher care needs.

Last, our research suggests a possible relationship between the supply of nursing home alternatives and nursing home closure rates. Facilities in states with more adult day service center providers and home health providers per 1000 older adults were more likely to close than facilities in states with fewer alternative providers. Since there are known disparities in access to HCBS between rural and urban areas,[11,12] we examined rural facilities and urban facilities separately. We found the same relationship in both settings. This relationship may reflect the decrease in demand for nursing home care due to the shift from residential care to home- and community-based care.[4] It may also reflect the impacts of competition, as facilities in states with more nursing homes per 1000 older adults were also more likely to close.

One limitation of our study is that we examined nursing home alternatives at the state level rather than the county level. We acknowledge that there is within-state variation in the availability of nursing home alternatives, and closures may be most influenced by alternatives nearby rather than state-wide. Future research should further examine the relationship between county-level availability of nursing home alternatives and closure. We also suggest including more granular urban-rural data, and additional nursing home alternatives should be examined, such as hospitals with swing beds that provide post-acute and long-term care, which are particularly important in rural areas.[12] Additionally, we acknowledge that closures may be influenced by additional factors related to

financial performance and suggest examining factors such as profit margins at the facility level in future research.

Conclusion

This study provides policymakers with a current understanding of nursing home closures and risk factors for closure. We did not find persistent increases in closures over the past decade, although we found relatively larger increases in closures more recently, in 2018 and 2019, indicating increases in termination from Medicaid and Medicare programs resulting from either physical closure or higher levels of mergers and acquisitions. So far, the pandemic has not led to a substantial increase in closures. However, financial distress that may cause closure takes time to develop, and the long-term effects of the pandemic on closures may not be apparent yet. Federal funds helped sustain nursing homes during the pandemic, and there may be additional closures as stimulus funding ends.

Some levels of closure are to be expected and may reflect healthy market processes. Closures were concentrated among lower-quality facilities, which may lead to positive changes in the overall quality of nursing home care. However, these closures may negatively impact access if low-quality facilities are located in areas without other nursing homes or nursing home alternatives. Additionally, there were more closures in states with more nursing homes and nursing home alternatives, which may indicate the positive effects of competition and consumer preference. Other closures may be driven by policy effects and should be examined further. For example, facilities with the highest staffing level and more Medicaid residents are also more likely to close.

Future research should examine whether nursing home access has been significantly affected by closures. Although we did not find a concerning increase in closures, there may be cases where closures cause immediate access problems to residents in these facilities. Additionally, we found geographical patterns in closures, which suggests that residents in certain states may be more likely to face access problems in the future. Facilities serving higher percentages of non-White residents and Medicaid populations were also more likely to close and, thus, closures may be exacerbating disparities in access to long-term care, although if they are selectively occurring among lower quality facilities, the effect may be unclear. Access issues could become more pressing in the upcoming decade due to aging population trends.

Supplementary material

Supplementary material is available at *Health Affairs Scholar* online.

Conflicts of interest

Please see ICMJE form(s) for author conflicts of interest. These have been provided as supplementary materials.

Notes

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