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Changes in Staffing, Resident Health, Closure, and Financial Performance of Rural Nursing Homes from 2017 to 2022

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Purpose

In a previous chartbook, the RUPRI Center evaluated the availability of nursing homes, staffing, and health of nursing home residents in 2019.[1] In this policy brief, we summarize staffing, resident health, mortality, closures, and financial performance of nursing homes in small or isolated rural towns, micropolitan, and metropolitan areas between 2017 to 2022.

Key Findings

- From 2017 to 2022, average staffing hours per resident-day in nursing homes decreased for certified nursing assistants and licensed practical nurses but increased for registered nurses across small or isolated rural towns, micropolitan, and metropolitan areas.
- A higher percentage of nursing home residents in small or isolated rural towns have depression and psychiatric needs in 2019 and 2022, compared to micropolitan and metropolitan areas.
- A lower percentage of nursing home residents have ADL limitations in 2019 and 2022 in small or isolated rural towns compared to metropolitan areas.
- Between 2017 and 2022, nursing home closures were more common in small or isolated rural towns (10.3 percent) than in micropolitan (7.9 percent) or metropolitan (8.5 percent) areas.
- Average nursing home occupancy rates dropped significantly from 2017 to 2021, particularly in small or isolated rural towns; occupancy increased slightly in 2022.
- Since 2020, total profit margins, and especially profit margins from patient care services, have declined substantially across small or isolated rural towns, micropolitan, and metropolitan areas.

Background

Approximately 15,000 nursing homes provide post-acute care services and assistance with activities of daily living to about one million older adults every year.[2,3] Despite the recent growth in home and community-based services, nursing homes continue to be the dominant provider of care to residents in rural (nonmetropolitan) areas. Rural facilities face distinct challenges, including geographic isolation, healthcare provider shortages, and high staff turnover.[4,5] Long-term care services in many rural areas are scarce, and many residents do not have timely access to adequate services.[6] The COVID-19 pandemic further exacerbated these challenges, with some of its most severe negative impacts affecting

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nursing home residents.[7,8] Studies indicate that the pandemic's impact was particularly severe for rural facilities, largely due to their weaker healthcare infrastructure and more vulnerable populations, characterized by older age, lower socio-economic status, and higher disease burden.[9] It is important to evaluate staffing, resident health, closures, and financial performance of nursing homes in small or isolated rural towns, micropolitan, and metropolitan areas before and during the pandemic for future policy considerations.

Methods

We combined data from several sources to evaluate nursing home characteristics from 2017 to 2022 across three geographic areas: isolated/small rural towns, micropolitan, and metropolitan areas. Our unit of analysis is the nursing home, with findings summarized across rurality using the 2010 Rural-Urban Commuting Area (RUCA) codes (the latest available at the time of analysis).[10] Metropolitan geographies are those with an urban place containing 50,000 or more people, and surrounding areas economically tied to that urban place as measured by commuting for work. Micropolitan geographies are those with an urban place containing 10,000-49,999 people, and surrounding areas economically tied to that urban place as measured by commuting for work. Small/isolated rural towns are places that are neither metropolitan nor micropolitan. Both small/isolated rural towns and micropolitan geographies are considered rural.[1]

We used Care Compare data from the Centers for Medicare & Medicaid Services (CMS) to obtain information on nursing home characteristics such as total beds, occupancy percentage, payer-mix, for-profit status, and staffing hours per resident day (HPRDs) for registered nurses (RNs), licensed practical nurses (LPNs), and certified nurse aides (CNAs).[11] We used the Certification and Survey Provider Enhanced Reports (CASPER) files from 2017-2022 to obtain information on residents' activities of daily living (ADL) status, as well as behavioral and mental health conditions such as depression, dementia, and Alzheimer's disease. Medicare Post-Acute Care and Hospice Provider Utilization and Payment Public Use Files (PAC PUF) were used to obtain data on individual physical and occupational therapy minutes before (2017-2019) and after (2020 onwards) the implementation of the Patient-Driven Payment Model (PDPM). We report therapy minutes per resident day in a given year from 2017 to 2021.[12] To obtain overall and COVID-19-related mortality per 100 residents, we used the Nursing Home COVID-19 Public File data collected through the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) from 2020-2022.[13] We report the number of closures over time using Medicare Provider of Services (POS) files and identify the proportions of nursing homes that closed during this period as a percentage of active nursing homes in 2022.[14] Finally, we used CMS Medicare Cost Reports to estimate total profit margins and profit margins from patient care services. We define total profit margins to include revenues and expenditures across all sources, whereas profit margins from patient care services are limited to revenues and expenditures related to patient care services.[15,16]

We combined the above datasets using the federal provider IDs of nursing homes. We summarize the variables with means and standard deviations for continuous variables and proportions for categorical variables. For comparisons, we use chi-square tests for categorical variables, and ANOVA or t-tests for continuous variables, with statistical significance defined at the five percent level.

Results

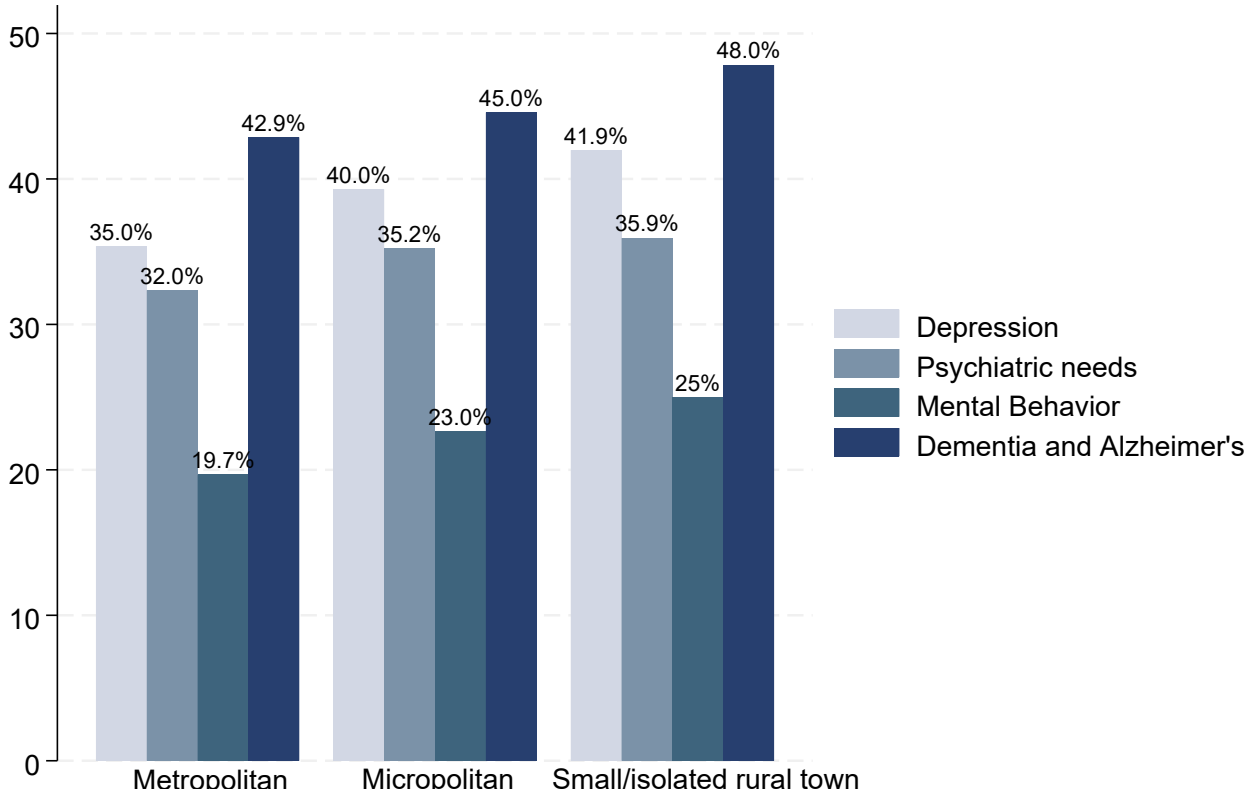
Our analytical sample includes 15,077 nursing homes across the U.S., located in metropolitan (n=10,036), micropolitan (n=2,091), and small/isolated rural towns (n=2,950). **Appendix Table 1** presents the characteristics of these nursing homes in 2022. Nursing homes in

[1] Metropolitan (RUCA codes 1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1), micropolitan (RUCA codes 4.0, 4.2, 5.0, 5.2, 6.0, and 6.1), and small or isolated rural towns (RUCA codes 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 10.0, 10.2, 10.3, 10.4, 10.5, and 10.6).

small/isolated rural areas are smaller in size, have lower occupancy rates, are less likely to operate as for-profit, and report lower LPN but higher CNA and RN HPRDs compared to those in metropolitan areas. Additionally, nursing homes in small/isolated rural towns have a slightly higher percentage of Medicaid recipients.

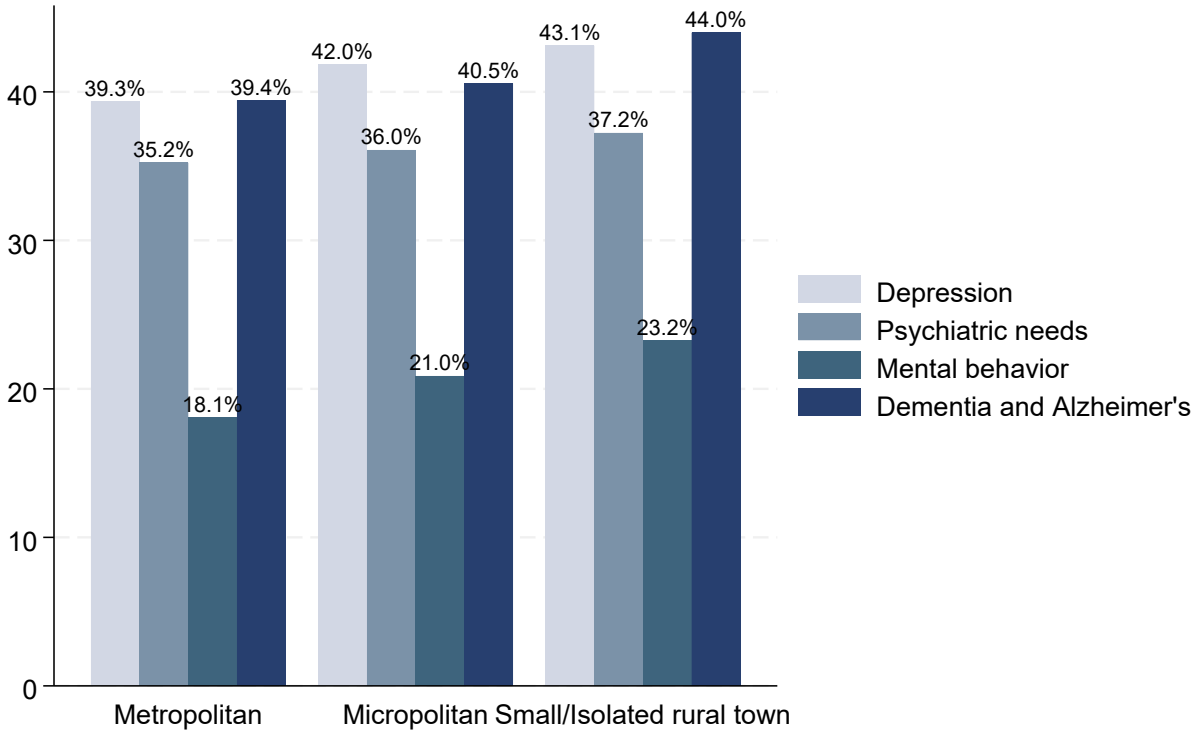
Figures 1 and 2 show that a higher percentage of nursing home residents have behavioral and mental health needs in 2019 and 2022 in small/isolated rural towns compared to metropolitan areas. Percentage of residents with depression and psychiatric needs have increased, while those with dementia and Alzheimer's and mental behavior have decreased across all areas from 2019 to 2022.

Figure 1: Percent of Nursing Home Residents with Behavioral/Mental Health Needs (2019)



Data Source: *Certification and Survey Provider Enhanced Reports (CASPER)*

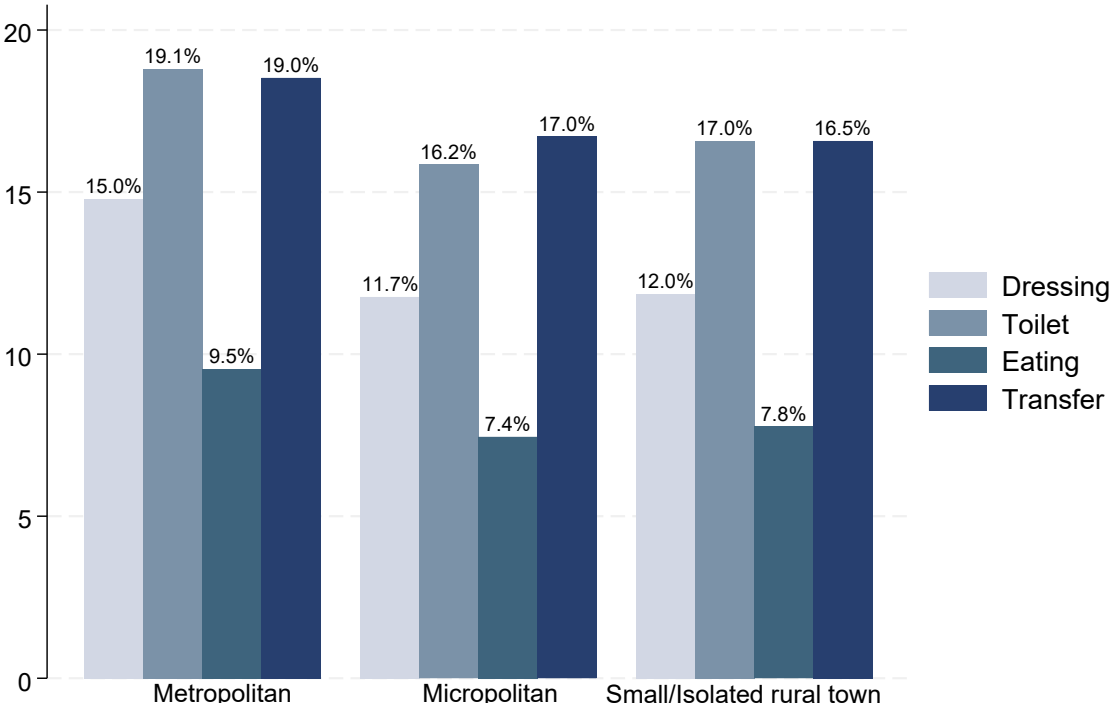
Figure 2: Percent of Nursing Home Residents with Behavioral/Mental Health Needs (2022)



Data Source: *Certification and Survey Provider Enhanced Reports (CASPER)*

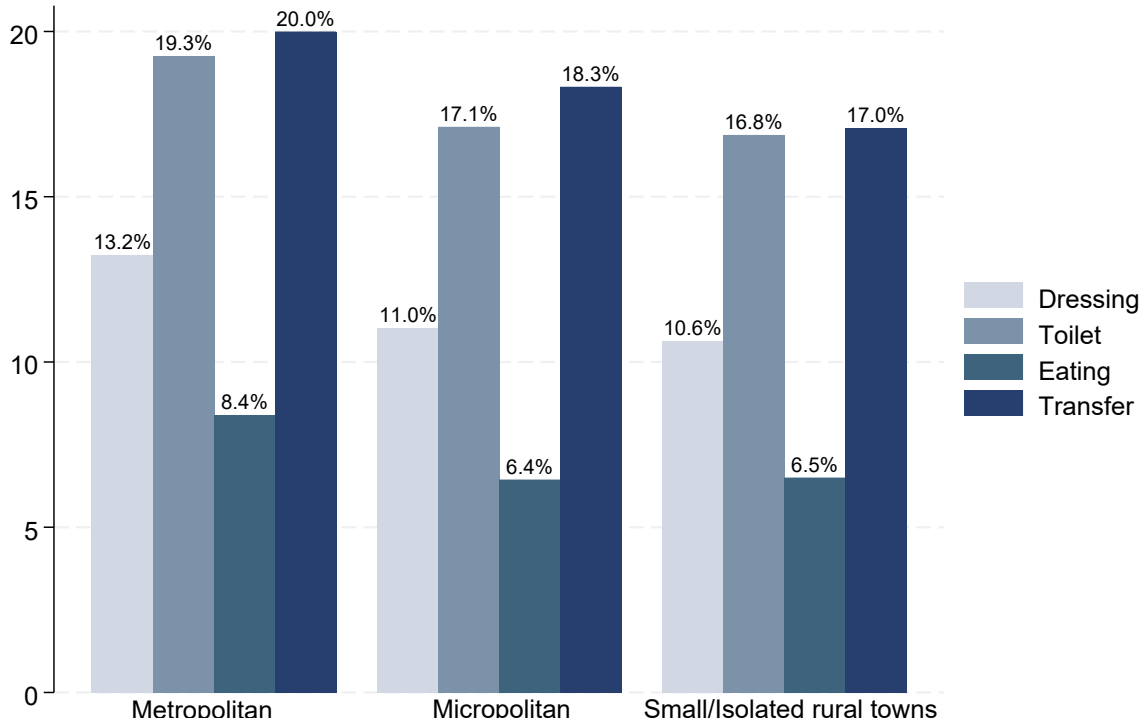
Figures 3 and **4** show that a lower percentage of nursing home residents have ADL limitations in 2019 and 2022 in small/isolated rural towns compared to metropolitan areas.

Figure 3: Percent of Nursing Home Residents with ADL Dependency (2019)



Notes: *Activities of daily living (ADL) are tasks related to personal care including dressing, toileting, eating, and transfer (bed mobility).* **Data Source:** *Certification and Survey Provider Enhanced Reports (CASPER)*

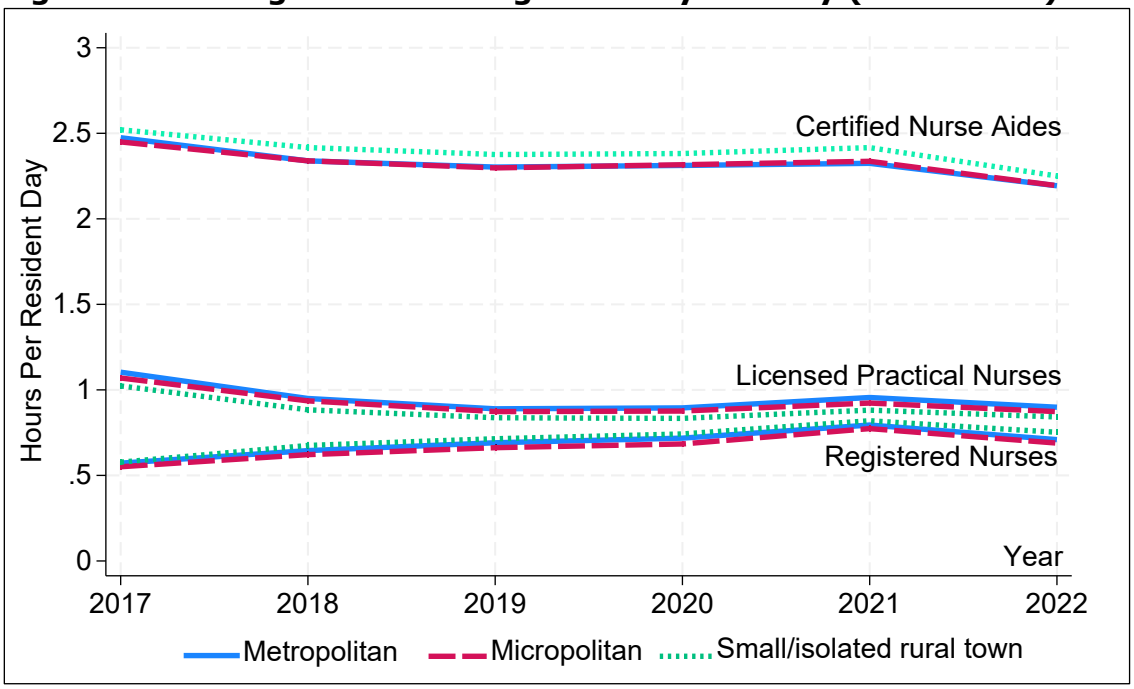
Figure 4: Percent of Nursing Home Residents with ADL Dependency (2022)



Notes: *Activities of daily living (ADL) are tasks related to personal care including dressing, toileting, eating, and transfer (bed mobility).* **Data Source:** *Certification and Survey Provider Enhanced Reports (CASPER)*

Figure 5 shows that HPRDs for LPNs and CNAs are generally declining over time but HPRDs for RNs increased until 2021 across all areas.

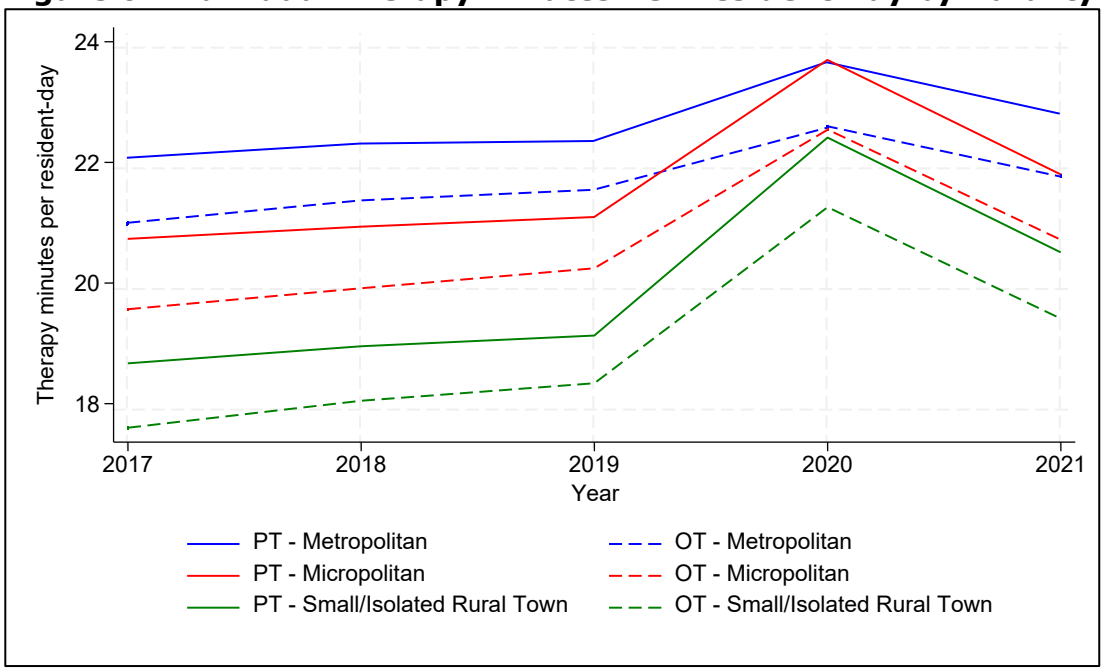
Figure 5: Nursing Home Staffing Levels by Rurality (2017-2022)



Notes: *Estimates based on Nursing Home Care Compare data.*

Figure 6 shows trends in individual physical therapy (PT) and occupational therapy (OT) minutes per resident day in nursing homes from 2017 to 2021. We find that residents in small/isolated rural towns are likely to have lower individual PT and OT therapy minutes.

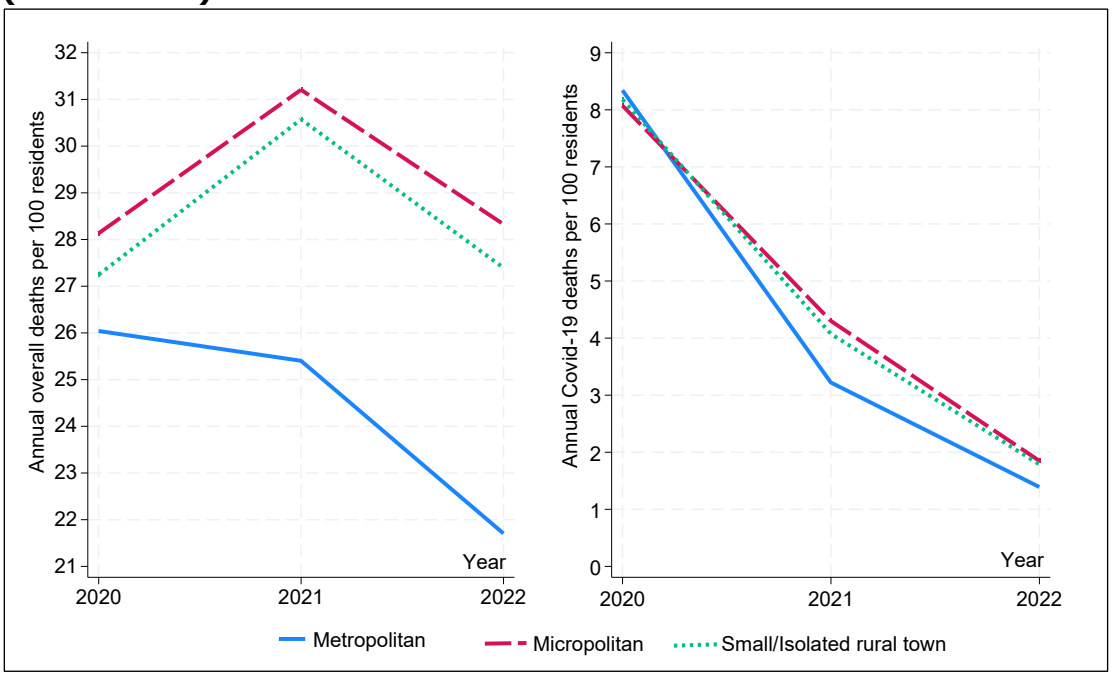
Figure 6: Individual Therapy Minutes Per Resident Day by Rurality (2017-2021)



Notes: *Estimates based on Medicare Post-Acute Care and Hospice Provider Utilization and Payment Public Use File (PAC PUF). PT: Physical Therapy, OT: Occupational Therapy. The y-axis starts at a non-zero value.*

Figure 7 shows mortality rates per 100 nursing home residents from 2020 to 2022.

Figure 7: Overall and COVID-19-related Mortality per 100 Residents by Rurality (2020-2022)

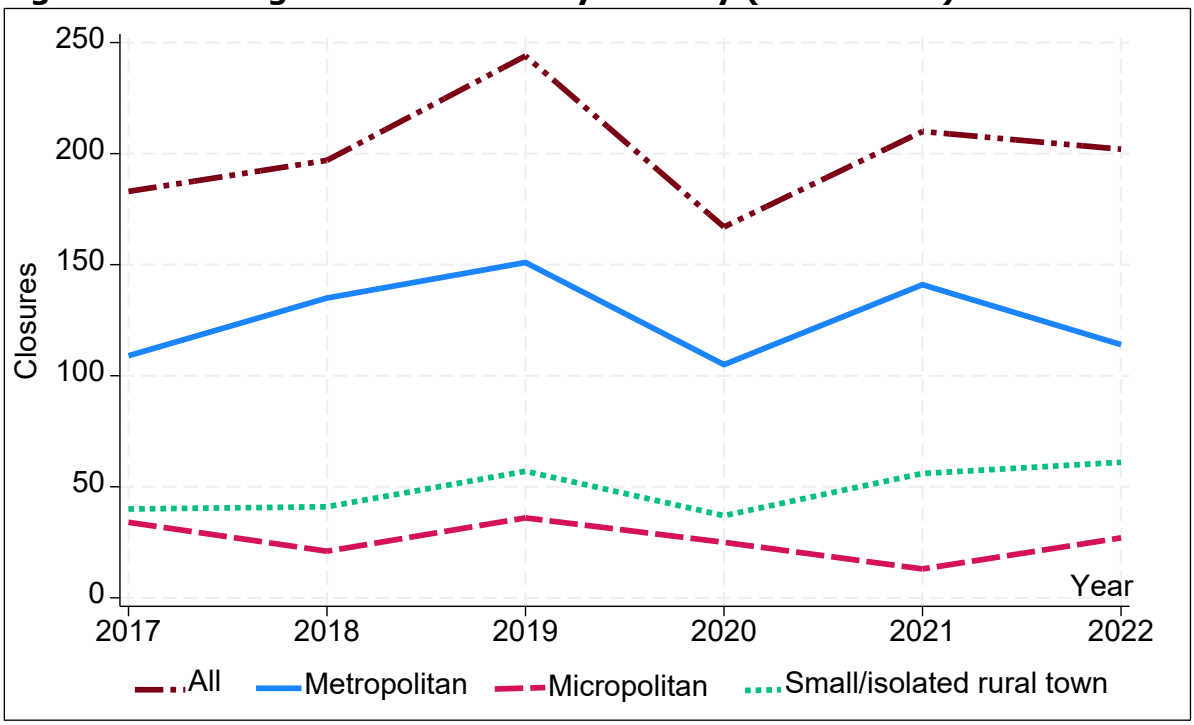


Notes: *Estimates based on National Healthcare Safety Network (NHSN) data. The y-axis for annual overall deaths per 100 residents starts at a non-zero value.*

Overall mortality rates continued to decline in metropolitan areas from the high levels in 2020, but small or isolated rural towns and micropolitan areas saw an increase in mortality in 2021 before declining in 2022. COVID-19-related mortality per 100 residents declined quickly in urban areas and were significantly lower compared to isolated/small rural towns in 2022 ($p<0.05$).

From 2017 to 2022, we observed the closure of 755 metropolitan, 156 micropolitan, and 292 small/isolated area nursing homes (**Figure 8**). As a percentage of open facilities in 2022, we observed a higher percentage of nursing home closures in small/isolated rural towns (10.3%) compared to metropolitan (8.5%) and micropolitan areas (7.9%).

Figure 8: Nursing Home Closures by Rurality (2017-2022)

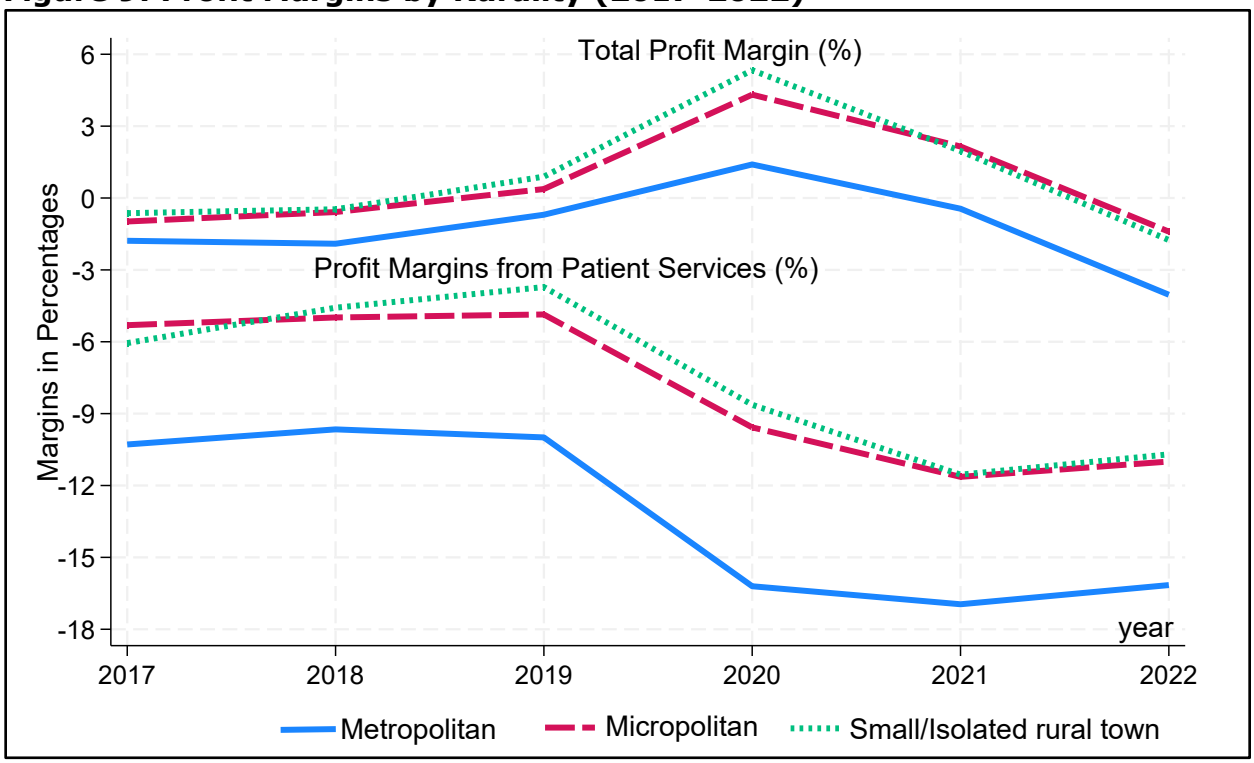


Notes: *Estimates based on Medicare Provider of Services (POS) data.*

Figures 9 shows that total profit margins and profit margins from patient care services. We observed an increase in total profit margins in 2020, but total profit margins have been declining since then. Profit margins from patient care services were negative and largely flat until 2019 but declined in 2020.

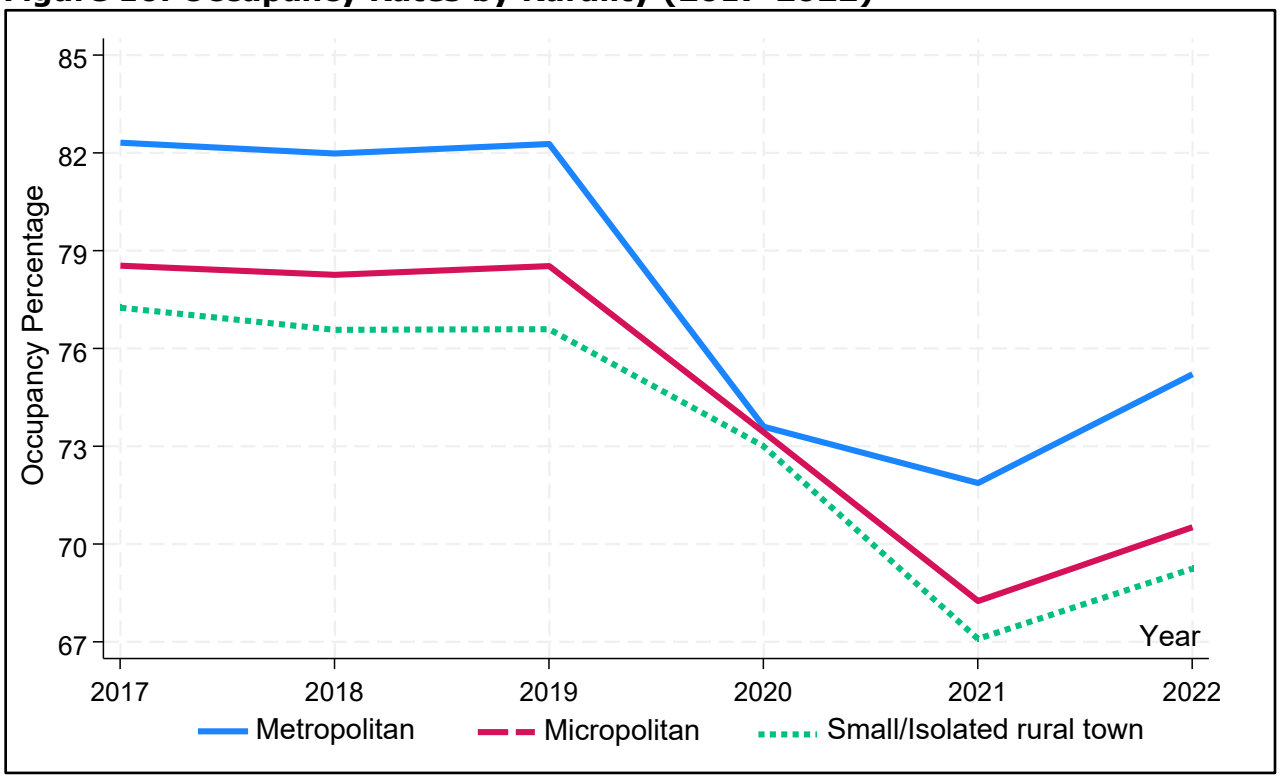
Figure 10 shows that occupancy rates plummeted in 2020 and 2021 and had not recovered to pre-pandemic levels in 2022, especially in small/isolated rural towns and micropolitan areas.

Figure 9: Profit Margins by Rurality (2017-2022)



Notes: *Estimates based on Medicare Cost Report data. The y-axis starts at a non-zero value.*

Figure 10: Occupancy Rates by Rurality (2017-2022)



Notes: Estimates based on Nursing Home Compare data. The y-axis starts at a non-zero value.

Discussion

In this policy brief we compared staffing, resident health, financial performance and closure of nursing homes in isolated/small rural towns, micropolitan, and metropolitan areas from 2017 to 2022. We observed higher nursing home closures and higher overall and COVID-19-related mortality rates in small/isolated rural towns when compared to metropolitan areas. Staffing measures were largely similar across geography, although we observed declining trends in CNA and LPN staffing over time. Compared with metropolitan areas, small or isolated rural towns had a higher percentage of residents with mental health needs and a lower percentage with ADL limitations. Finally, occupancy rates in small/isolated rural towns have declined substantially since the COVID-19 pandemic and have not recovered. This has adversely impacted profit margins from patient care services.

Our findings are consistent with previous studies that have suggested that CNA shortages continue to be a concern for nursing homes despite the use of agency staff and declining patient admissions.[17,18] Although staffing HPRDs for all staff types are higher in 2020-21 than previous years (likely due to decreased occupancy levels), we find decreasing trends in staffing HPRDs across rurality over time.

Research suggests that the pandemic severely impacted rural areas due to weaker health infrastructure, vulnerable populations, and persistent staff shortages, contributing to a slower recovery in rural areas compared to metropolitan areas.[8,19,20] We find that total and COVID-19-related mortality rates were higher and slower to improve in small/isolated rural towns. Our findings are also consistent with previous study that reported higher nursing home closure rates in non-metropolitan nursing homes.[21] Factors contributing to higher closures in rural areas may include lower occupancy rates, a higher proportion of Medicaid residents, and the greater impact of the COVID-19 pandemic on these facilities.[21] Our findings suggest a large decline in nursing home occupancy following the COVID-19 pandemic from which nursing homes have not recovered, especially in small/isolated rural towns. Profit margins from patient care services are lower for nursing homes in isolated/small rural towns and this in turn may have affected total profit margins, threatening the financial viability of rural nursing homes.

Our findings highlight the need for policymakers to strengthen rural infrastructure and address issues around low occupancy and high closure rates of nursing homes. Occupancy rates in nursing homes have declined since 2020 due to COVID-19-related deaths, reduced admissions driven by fear of infection, and a growing shift toward home- and community-based services.[20,22] Higher mortality rates in rural areas during the pandemic suggests a need to bolster emergency preparedness infrastructure in rural areas[20] while expanding telehealth and remote support services to ensure quality care.[9] Financial stabilization is also essential for strengthening rural nursing homes, which can be achieved through higher Medicaid reimbursement rates and providing grants or low-interest loans.[6] These combined efforts will not only improve staffing shortages/levels and operational stability but also ensure high-quality, resilient care for rural nursing home residents.

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Appendix

Appendix Table 1: Nursing Home Characteristics by Rurality in 2022

Variables	Metropolitan N=10,036	Micropolitan N=2,091	Small/isolated rural town N=2,950	All N=15,077
Total Beds	117.10 (65.5)	99.78 (43.4)	78.72 (35.4)	107.09 (59.8)
Occupancy %	79.75 (53.3)	75.86 (16.6)	74.12 (16.9)	78.05 (44.5)
Payer mix	59%		61%	
Medicaid	14%		13%	59%
Medicare	27%	60%	26%	14%
Private		14%		27%
		26%		
For-Profit Status	73%	70%	61%	70%
Staffing Hours	0.68 (0.49)	0.66 (0.40)	0.72 (0.47)	0.69 (0.49)
RNs HPRD	0.94 (0.23)	0.89 (0.34)	0.84 (0.22)	0.92 (0.36)
LPNs HPRD	2.29 (0.57)	2.30 (0.60)	2.41 (0.62)	2.32 (0.58)
CNA HPRD				

Notes: *Estimates based on nursing home compare and CASPER data for the year 2022. HPRD: Hours Per Resident Day, RNs: Registered Nurses, LPNs: Licensed Practical Nurses, and CNAs: Certified Nurse Aide. We report means and standard deviation (in parenthesis) for continuous variables and proportions for categorical variables.*