



The Effect of Nursing Home Closures: Staff Replacement, Resident Relocation, and Quality of Care

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Abstract

Objective

- To examine the effect of nursing home closures on the quality of care in nearby facilities, comparing differential impacts across urban and rural counties.

Study Design

- The study used a difference-in-differences approach to analyze yearly county-level data. I compare changes in occupancy rates, staffing levels, and quality ratings between counties that experienced nursing home closures and those without.

Conclusion

- The study found that nursing home closures could exacerbate the rural-urban healthcare disparities. Policymakers should consider supporting nursing homes to ensure equitable access to and quality of long-term care in rural counties.

Introduction

- Nursing home closures are increasingly common in the U.S., driven by reduced Medicaid reimbursements, rising operational costs, and persistent staffing shortages, which were exacerbated by the COVID-19 pandemic.
- Nursing home closures not only affect relocated residents but also have spillover effects on nearby operational facilities. However, this aspect has received limited empirical attention, so this study aims to address this gap.

Hypothesis

- As nursing homes shut down, surrounding facilities will encounter a rise in occupancy rates and a reduction in staffing levels. Consequently, the quality of care in nearby nursing homes will deteriorate following a closure.

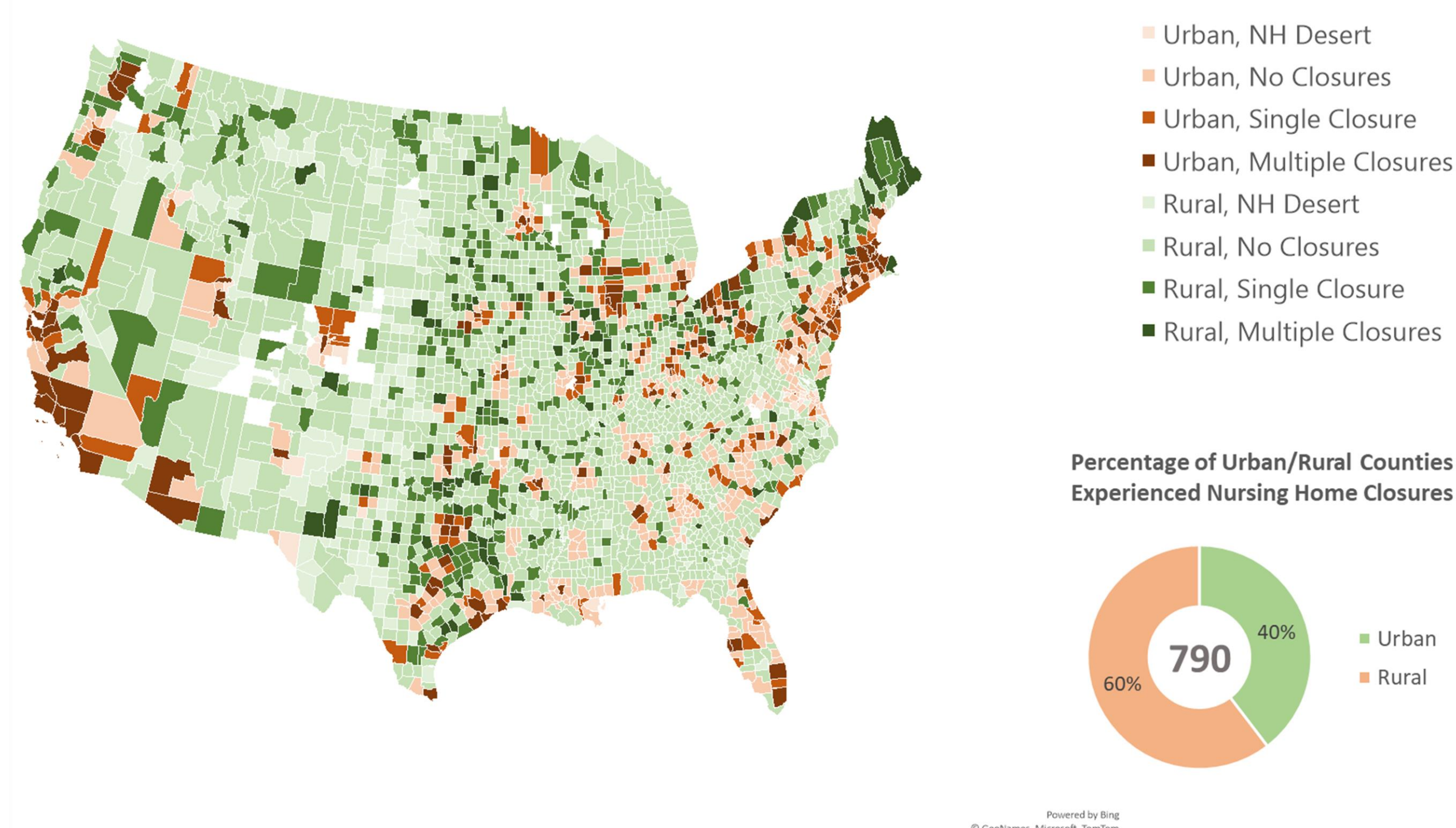


Figure 1. Nursing Home Closures, 2009-2019

Data and Methods

Data

- I used the Provider of Services (POS) file to collect information on certified bed counts, termination dates/codes, and facility locations from 2009 to 2019.
- I employed the Nursing Home Compare dataset to evaluate staffing levels and the five-star quality ratings of nursing homes during the study period.
- I utilized the LTCFocus dataset to gather information on various characteristics of nursing home residents, including age, race, sex, and payment methods.

Research Design

- Independent variable: The binary (0/1) variable indicating whether a county c experienced the nursing home closures during the study period in year t
- Outcome variables: Occupancy rate, staffing levels, five-star quality rating (overall, staffing, health inspections, quality measures) for county c in year t

Empirical Strategy

- Callaway and Sant'Anna Difference-in-Differences (C&S DID)

$$Y_{ct} = \beta_0 + \beta_1 NHClosure_{ct} + \beta_2 X_{ct} + \theta_c + \tau_t + \varepsilon_{ct}$$

Results

Effects on resident and staffing levels

- Nursing home closures lead to statistically significant increases in occupancy rates in urban and rural counties, rising by 1.1% ($p < 0.05$) and 4.0% ($p < 0.01$).
- In rural counties, closures are associated with declines in licensed practical nurses (LPN) HPRD by 1.8% ($p < 0.01$) and registered nurses (RN) HPRD by 7.5% ($p < 0.01$), while only RN HPRD decrease by 4.5% ($p < 0.01$) in urban counties.

Effects on the quality of care

- Nursing home closures result in notable declines in staffing quality ratings in urban and rural counties, with decreases of 4.5% ($p < 0.01$) and 7.5% ($p < 0.01$).
- Health inspections rating fall by 2.9% ($p < 0.1$) in rural counties, while urban counties experience a 3.6% ($p < 0.05$) improvement in quality measures rating.

Table 1. Average Treatment Effects of Nursing Home Closures on Resident and Staffing Levels: C&S DID

	Resident and Staffing Levels					
	Occupancy Rate (1)	Log CNA HPRD (2)	Log LPN HPRD (3)	Log RN HPRD (4)	Log Nurses HPRD (5)	Log DC HPRD (6)
Full sample	2.896*** (0.402)	0.002 (0.003)	-0.014*** (0.005)	-0.061*** (0.007)	-0.051*** (0.007)	-0.002 (0.003)
Unique counties	2,554	2,516	2,516	2,516	2,516	2,516
Urban counties	1.098** (0.52)	0 (0.005)	-0.008 (0.006)	-0.045*** (0.011)	-0.036*** (0.008)	0 (0.004)
Unique counties	700	694	694	694	694	694
Rural counties	4.026*** (0.549)	0.003 (0.005)	-0.018*** (0.007)	-0.075*** (0.01)	-0.065*** (0.009)	0.003 (0.005)
Unique counties	1,854	1,822	1,822	1,822	1,822	1,822
County-level demographic controls	Yes	Yes	Yes	Yes	Yes	Yes
County-level market activity controls	Yes	Yes	Yes	Yes	Yes	Yes
Fix effects: county, year	Yes	Yes	Yes	Yes	Yes	Yes

Note: Demographic controls include the number of certified beds, average age of residents, and the percentages of female, White, Medicaid-supported, and Medicare-supported residents. Market activity controls include the cumulative numbers of nursing home entries up to a specific year. Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels. Abbreviations: HPRD, hours per resident day; CNA, certified nursing assistant; LPN, licensed practical nurse; RN, registered nurse; Nurses, Licensed Nurses (LPN+RN); DC, direct care staff (CNA+LPN+RN).

Table 2. Average Treatment Effects of Nursing Home Closures on the Quality of Care: C&S DID

	Quality of Care			
	Log Overall Rating (1)	Log Staffing Rating (2)	Log Health Inspections Rating (3)	Log Quality Measures Rating (4)
Full sample	-0.008 (0.013)	-0.065*** (0.01)	-0.011 (0.012)	0.03*** (0.011)
Unique counties	2,528	2,517	2,528	2,528
Urban counties	0.008 (0.017)	-0.045*** (0.012)	0.02 (0.017)	0.036** (0.014)
Unique counties	696	695	696	696
Rural counties	-0.021 (0.016)	-0.075*** (0.013)	-0.029* (0.018)	0.023 (0.014)
Unique counties	1,832	1,822	1,832	1,832
County-level demographic controls	Yes	Yes	Yes	Yes
County-level market activity controls	Yes	Yes	Yes	Yes
Fix effects: county, year	Yes	Yes	Yes	Yes

Note: Staff rating is based on nursing home staffing levels and staff turnover. Health inspections rating is based on outcomes from state health inspections. Quality measures rating is based on MDS and claims-based quality measures. Demographic controls include the number of certified beds, average age of residents, and the percentages of female, White, Medicaid-supported, and Medicare-supported residents. Market activity controls include the cumulative numbers of nursing home entries up to a specific year. Standard errors are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Discussion

- This paper reveals that the occupancy rate increases more sharply in rural areas than in urban areas following nursing home closures. This trend is primarily due to limited relocation options, which leads to significant declines in staffing levels, particularly for licensed practical nurses (LPNs) and registered nurses (RNs). Certified nursing assistants (CNAs) are less impacted, indicating that higher-skilled positions face more recruitment challenges, especially in rural counties. This situation risks exacerbating healthcare disparities, reducing access to and the quality of long-term care in underserved areas.
- The outcomes of the quality ratings differ between urban and rural areas. In rural counties, health inspections rating declines following nursing home closures, while urban areas experience improvements in quality measures rating. This contrast reflects the differences between competitive and concentrated markets. In competitive markets, facilities tend to enhance efficiency and care quality. However, in concentrated markets, the remaining nursing homes may feel less pressure to uphold high service standards due to limited competition. Future analysis will incorporate the empirical IO methods to investigate these dynamics further, focusing on entry-exit patterns and spatial competition.

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