For-Profit Hospitals Have a Unique Opportunity to Serve as Anchor Institutions in the U.S.

Cory E. Cronin

Ohio University

Berkeley Franz (✉ franzb@ohio.edu)

Ohio University Heritage College of Osteopathic Medicine <https://orcid.org/0000-0003-2091-1891>

Kelly Choyke

Ohio University Heritage College of Osteopathic Medicine

Vanessa Rodriguez

Ohio University Heritage College of Osteopathic Medicine

Brian K. Gran

Case Western Reserve University

Research article

Keywords: Hospitals, For-profit, Anchor Institutions, Economic Stability, Medical Geography

Posted Date: September 9th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-55367/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Version of Record: A version of this preprint was published at Preventive Medicine Reports on June 1st, 2021. See the published version at <https://doi.org/10.1016/j.pmedr.2021.101372>.

Abstract

Background

Hospitals serve as anchor institutions in many U.S. communities and make contributions to bolster population health and reduce preventable death. Most studies to date have focused on nonprofit hospitals, but there may be significant opportunity for for-profits to fill this role in both urban and rural communities.

Methods

We calculated descriptive statistics and a multivariate regression model to assess economic and health characteristics for all U.S. counties that contain for-profit as compared to nonprofit or public hospitals.

Results

For-profit hospitals are more likely to be located in counties with higher uninsurance rates and lower self-rated health. After controlling for hospital and county characteristics, we found a significant and positive relationship between for-profit hospital presence and higher county unemployment, higher uninsured rates, and the number of residents reporting poor/fair health. For-profit hospitals were also less likely to be located in states that had expanded Medicaid or which had certificate-of-need laws.

Conclusions

There is substantial opportunity for for-profit hospitals to serve as anchor institutions in many U.S. communities, despite this label more traditionally being applied to nonprofit hospitals. Given that there is not currently a regular reporting mechanism for documenting the community health contributions of for-profit hospitals, policymakers and researchers should evaluate the current state of these contributions and develop incentives to encourage more anchor activities to benefit economically vulnerable communities in the U.S.

Background:

Hospitals serve as prominent public health partners in U.S. communities and make contributions to bolster population health and improve economic conditions. These investments are vital to addressing health disparities and reducing preventable deaths (1). Although nonprofit hospitals are legally required to undertake population health activities, no data are available regarding the population health investments of for-profit or public hospitals. Given recently implemented reimbursement mechanisms, considerable incentives may encourage for-profit hospitals to invest in improving health in their surrounding communities. It is not clear, however, what the economic and public health impacts would be if for-profit hospitals directed more resources toward population health improvement.

The vast majority of hospitals currently operating in the United States are in the corporate form, meaning they are either privately owned nonprofit or for-profit hospitals. While government-funded public hospitals still comprise approximately 18.5% of the U.S. market, today nonprofits and for-profits control 81.5% of the American hospital market (2). Although more than half of hospitals nationwide are nonprofit, for-profit hospitals are growing in number and compose approximately a quarter of hospitals (2).

Hospitals have long been considered central to the welfare of a community, given their mission to provide acute medical services. However, hospitals also fill important nonmedical roles in both urban and rural communities (3–5). For example, hospitals frequently are the largest employers in their communities and are less likely than other businesses to leave the community and relocate elsewhere. For this reason, hospitals are often referred to as anchor institutions because they have strong potential to bolster economic development within communities and increase well-being (6,7).

An 'anchor institution' is a large institution - typically an educational, health, or other large corporation – that is not only deeply embedded within the economic infrastructure of a community, but also plays a role in improving community life, and in the case of hospitals, community health (8–13). Beyond job opportunities, anchor institutions invest in the social, economic, and health development of local communities as a significant part of their business models (10,13). Koh and colleagues describe anchors as institutions that “commit major financial, human, and intellectual resources to address social challenges, understanding that their future is inextricably linked to the community outside their walls” (10 p. 309). While hospitals in general have been discussed as having the potential to be anchor institutions (10,13), only nonprofits have been typically described as such (8). The result is that very little literature exists on the public health potential of for-profit institutions.

For-profit hospitals do have documented differences in comparison to nonprofits, and these differences may affect the potential for for-profit organizations to function as anchor institutions. For example, for-profit hospitals are more efficient in terms of employees, which may limit the numbers of jobs they provide to the local community (14). For-profits are also more likely to offer services that are profitable, as opposed to unprofitable but necessary, which may impact access to critical health care services in medically underserved settings (15–19).

Some scholars have argued that there are no significant differences in mission across for-profit and nonprofit hospitals and have questioned why most discussion of hospital anchors has focused on nonprofits in particular (20,21). There do not seem to be significant differences in the amount of uncompensated care offered by each hospital type (22–27), and there is evidence to suggest that for-profits serve a larger proportion of Medicaid patients, especially in rural markets (28).

Less is known about hospital decisions to enter health care markets and the distribution of for-profit vs. nonprofit hospitals in communities where institutional investments would have significant potential to elevate local population health. Regulatory and market changes, such as the introduction of the Medicare and Medicaid Prospective Payment System (PPS) in 1983, and ensuing changes to state and federal policy governing nonprofits and for-profits on a state by state basis, have created a mixed medical market in the U.S. that varies by state and region, with some states having more desirable markets for for-profits, such as Texas and Florida, and some states that do not have desirable, or open markets, for for-profits, such as New York, Maryland, and Vermont (18,19,29–31). There is evidence that for-profit hospitals may choose to locate in communities where there is less competition and better reimbursement rates (32) but more research is needed to understand the regional distribution of for-profit hospitals and the social and economic characteristics of the communities in which they are located.

The aim of this study, accordingly, is to understand if for-profit hospitals are located in unique social and economic environments as compared to their nonprofit and public hospital counterparts. This manuscript contributes to the existing literature in two key ways. First, the results will identify factors that increase the likelihood of hospitals of different ownership types operating in a county. Second, these results will provide insight into economic and health needs in the counties where different types of hospitals are located and will, as a result, illuminate the likely impacts of population health initiatives of for-profit hospitals in particular.

Methods:

Data:

Our data come from the United States Census American Community Survey, the Area Health Resource File and the American Hospital Association (AHA) Annual Survey. Community characteristics from all data sources are from the year 2017, while hospital characteristics are from 2018 data. The dataset also includes data on 2016 state certificate-of-need laws from the Mercatus Center at George Mason University (33) state Medicaid expansion data from the Kaiser Family Foundation (34) and purchasing power data sourced from the U.S. Census Bureau Current Population Survey and the Council for Community and Economic Research, congregated by advisorperspectives.com (35).

Sample

This study assesses characteristics as they relate to a hospital's presence in a county. The sample for the descriptive portion of the study consists of all U.S. hospitals and the counties within which they are located. The sample for the analytic portion of the

study consists of U.S. counties with general medical hospitals (excluding federal hospitals, but including other public hospitals). Counties with multiple general medical hospitals are observed multiple times in the sample. After accounting for missing data, the analytic sample for this study is 4,622 county observations. Eighteen hospitals were dropped because of missing county-level information, and one was dropped because of data missing on an AHA variable. For this reason, these observations were not included in the analysis.

Analytic strategy

In addition to the use of descriptive statistics, this study employs multivariate logistic regression. The key dependent variable for this analysis is the presence of a for-profit hospital within a county, considering county characteristics and hospital characteristics. We calculate the odds of a county containing a for-profit hospital in four individual models, each with a key county health or economic measure. Key measures include one health indicator, the percent of the population reporting poor or fair health, and three economic variables: unemployment, uninsured rate, and median per capita income. To offer a comparison between hospital ownership types, we further calculate the same models in relation to nonprofit hospital presence and then in relation to public hospital presence. The analysis also considers hospital characteristics (size, system membership, and teaching status), community and geographic characteristics (number of hospitals in county adjusted for population, percent of population white, and rural location), and policy characteristics (state has certificate-of-need regulation in place and status of Medicaid expansion) (measures described in Table 1).

Table 1
Descriptive Statistics of County and Hospital Characteristics

Variable:	Description and source:	Full sample (all US counties)		Analytic sample (only counties with general medical centers and after missing data)	
Counties	Counties within U.S. states; U.S. Census	6818		4622	
For-profit general medical hospitals	Ownership status definition; American Hospital Association 2018 Annual Survey	694	10.00%	694	15.02%
Nonprofit general medical hospitals	Ownership status definition; American Hospital Association 2018 Annual Survey	2780	41.00%	2780	60.15%
Public general medical hospital	Ownership status definition; American Hospital Association 2018 Annual Survey	957	14.00%	957	20.71%
Percent unemployed	Percent of county residents unemployed; sourced Area Health Resource File from U.S. Census		4.50%		4.50%
Percent uninsured	Percent of county residents under age 65 without health insurance ; sourced Area Health Resource File from U.S. Census		10.91%		10.68%
Percent reporting poor/fair health	Percent of county residents reporting health status as fair or poor ; County Health Rankings		16.97%		16.83%
Adjusted median income	County median income adjusted for purchasing power*	55550		55103	
Hospitals adjusted for population	Number of hospitals in a county per 1,000 residents; Area Health Resource File	0.34		0.46	
Percent population white	Percent of the population single race, white non-hispanic; Area Health Resource File	0.77		0.77	
Rural location	County is non-metro on the USDA ERS classification; sourced Area Health Resource File	2452	36.00%	1872	40.50%
System member	Hospital is member of a health system; AHA 2018 Annual Survey	4094	60.00%	3096	66.98%
Teaching status	Hospital is a major teaching hospital; AHA 2018 Annual Survey	299	4.86%	286	6.19%
Beds size:	Categories of total hospital beds; AHA 2018 Annual Survey				
Fewer than 50		2235	32.78%	1613	34.91%
Beds 50–199		2400	35.20%	1655	35.81%
Beds 200–399		998	14.64%	874	18.91%
Beds greater than 400		1185	17.38%	480	10.39%
State has CON regulation	State has certificate-of-need law in place; https://www.mercatus.org	4286	62.86%	2892	62.57%

Variable:	Description and source:	Full sample (all US counties)		Analytic sample (only counties with general medical centers and after missing data)	
State expansion of Medicaid	State has expanded Medicaid; khn.org	3773	55.34%	2651	57.36%
Region:	U.S. region; Census Bureau				
South		2831	41.52%	1730	37.43%
Northeast		820	12.03%	561	12.14%
Midwest		1897	27.82%	1379	29.84%
West		270	18.63%	952	20.60%

[Table 1 about here]

Results:

Descriptive statistics identified 694 for-profit general medical centers, which account for 15% of the 4622 hospitals in the analytic sample. We identified 243 counties in the U.S. as having only for-profit hospitals, whereas 1,373 counties across the country have at least one non-profit hospital and no for-profit hospitals. The majority of counties with for-profit hospitals are also served by non-profit or public hospital facilities. As Fig. 1 shows, for-profit hospitals are not consistently distributed across the country and are instead concentrated in certain regions.

[Figure 1 about here]

The counties assessed in this study average a 5% unemployment rate; an 11% uninsured rate; and a 17% rate of reporting poor or fair health, with a median income (adjusted for purchasing power) of \$55,000. However, counties with for-profit hospitals report higher averages in uninsurance rates (13%) and in reporting poor or fair health (18%) (Fig. 2). This gap between the means for the total sample and the for-profit hospitals' counties widens when comparing nonprofit hospitals' counties and for-profit hospitals' counties. Descriptive statistics also indicated that counties with for-profit hospitals had, on average, a lower median income (adjusted for purchasing power) than those with nonprofit hospitals.

[Figures 2 and 3 about here]

Our multivariate analysis provides further understanding of the county characteristics associated with for-profit hospital presence (See Table 2). The analysis presented a significant relationship between for-profit hospital presence and higher county unemployment, higher uninsured rates, and the number of residents reporting poor/fair health. For-profit hospital presence was also significantly associated with lower median income (adjusted for purchasing power), though the effect for this variable was low.

Table 2
Multivariate Results of Characteristics Associated with For-Profit Hospital Presence

<i>Continuous key variable N = 4,622 counties with general medical centers</i>												
	Unemployed			Uninsured			Poor/Fair Health			Purchasing power/Adjusted median income		
	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int
key variable	1.12 (0.04)	0.001	[1.05–1.19]	1.1 (0.01)	0.000	[1.07–1.13]	1.1 (0.01)	0.000	[1.08–1.13]	0.99 (0)	0.002	[0.98–1]
Hospitals in market (adjusted for population)	0.46 (0.08)	0.000	[0.32–0.66]	0.43 (0.08)	0.000	[0.31–0.61]	0.44 (0.08)	0.000	[0.3–0.63]	0.44 (0.08)	0.000	[0.31–0.63]
County percent white	1 (0)	0.077	[1–1.01]	1.01 (0)	0.032	[1–1.01]	1 (0)	0.051	[1–1.01]	1 (0)	0.061	[1–1.01]
Rural location	0.59 (0.07)	0.000	[0.46–0.75]	0.55 (0.07)	0.000	[0.43–0.71]	0.49 (0.06)	0.000	[0.38–0.63]	0.56 (0.07)	0.000	[0.44–0.72]
Hospital part of system	2.52 (0.3)	0.000	[1.99–3.18]	2.63 (0.32)	0.000	[2.07–3.33]	2.62 (0.32)	0.000	[2.07–3.33]	2.45 (0.29)	0.000	[1.94–3.1]
Teaching hospital	0.14 (0.06)	0.000	[0.06–0.33]	0.14 (0.06)	0.000	[0.06–0.32]	0.14 (0.06)	0.000	[0.06–0.32]	0.14 (0.06)	0.000	[0.06–0.32]
Bed size: 50–199	1.11 (0.13)	0.356	[0.89–1.4]	1.18 (0.14)	0.157	[0.94–1.5]	1.09 (0.13)	0.447	[0.87–1.38]	1.1 (0.13)	0.409	[0.88–1.39]
Bed size: 200–399	0.75 (0.11)	0.051	[0.57–1]	0.76 (0.11)	0.058	[0.57–1.01]	0.72 (0.1)	0.023	[0.54–0.95]	0.74 (0.11)	0.037	[0.56–0.98]
Bed size: greater than 400	0.46 (0.1)	0.000	[0.3–0.69]	0.44 (0.09)	0.000	[0.29–0.67]	0.43 (0.09)	0.000	[0.28–0.65]	0.45 (0.09)	0.000	[0.3–0.67]
State has CON law	0.62 (0.06)	0.000	[0.5–0.76]	0.78 (0.08)	0.021	[0.64–0.96]	0.63 (0.07)	0.000	[0.51–0.77]	0.6 (0.06)	0.000	[0.49–0.74]
State has expanded Medicaid	0.52 (0.07)	0.000	[0.41–0.67]	0.87 (0.12)	0.314	[0.66–1.14]	0.49 (0.06)	0.000	[0.38–0.62]	0.53 (0.07)	0.000	[0.42–0.68]
Region: Northeast	0.26 (0.06)	0.000	[0.17–0.4]	0.36 (0.08)	0.000	[0.23–0.56]	0.41 (0.09)	0.000	[0.26–0.64]	0.25 (0.05)	0.000	[0.16–0.38]
Region: Midwest	0.22 (0.04)	0.000	[0.16–0.3]	0.33 (0.06)	0.000	[0.23–0.46]	0.32 (0.05)	0.000	[0.23–0.44]	0.22 (0.03)	0.000	[0.16–0.3]
Region: West	0.67 (0.1)	0.009	[0.5–0.9]	0.83 (0.13)	0.242	[0.61–1.13]	0.94 (0.15)	0.703	[0.69–1.29]	0.63 (0.1)	0.002	[0.47–0.85]
Non-profit comparison (probably to include as appendix)												
<i>Continuous key variable N = 4,622 counties with general medical centers</i>												
	Unemployed			Uninsured			Poor/Fair Health			Purchasing power/Adjusted median income		

<i>Continuous key variable N = 4,622 counties with general medical centers</i>												
	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int
key variable	0.94 (0.02)	0.008	[0.89– 0.98]	0.93 (0.01)	0.000	[0.92– 0.95]	0.93 (0.01)	0.000	[0.92– 0.95]	1.01 (0)	0.016	[1– 1.01]
Hospitals in market (adjusted for population)	0.77 (0.04)	0.000	[0.69– 0.85]	0.81 (0.04)	0.000	[0.73– 0.9]	0.75 (0.04)	0.000	[0.68– 0.84]	0.79 (0.04)	0.000	[0.71– 0.87]
County percent white	1 (0)	0.506	[1–1]	1 (0)	0.746	[1–1]	1 (0)	0.672	[1–1]	1 (0)	0.526	[1–1]
Rural location	1.18 (0.1)	0.050	[1– 1.4]	1.23 (0.11)	0.016	[1.04– 1.45]	1.32 (0.12)	0.001	[1.12– 1.57]	1.22 (0.11)	0.024	[1.03– 1.46]
Hospital part of system	1.89 (0.14)	0.000	[1.64– 2.17]	1.86 (0.13)	0.000	[1.62– 2.15]	1.87 (0.13)	0.000	[1.62– 2.15]	1.9 (0.14)	0.000	[1.65– 2.19]
Teaching hospital	0.68 (0.11)	0.022	[0.49– 0.95]	0.69 (0.11)	0.023	[0.5– 0.95]	0.7 (0.12)	0.032	[0.51– 0.97]	0.69 (0.11)	0.025	[0.5– 0.96]
Bed size: 50–199	1.2 (0.1)	0.023	[1.03– 1.41]	1.17 (0.1)	0.063	[0.99– 1.37]	1.22 (0.1)	0.018	[1.03– 1.43]	1.21 (0.1)	0.022	[1.03– 1.42]
Bed size: 200–399	1.63 (0.18)	0.000	[1.32– 2.02]	1.63 (0.18)	0.000	[1.32– 2.02]	1.68 (0.18)	0.000	[1.35– 2.08]	1.64 (0.18)	0.000	[1.33– 2.03]
Bed size: greater than 400	2.23 (0.34)	0.000	[1.67– 3]	2.29 (0.35)	0.000	[1.7– 3.08]	2.3 (0.35)	0.000	[1.71– 3.09]	2.26 (0.34)	0.000	[1.68– 3.03]
State has CON law	1.05 (0.08)	0.546	[0.9– 1.21]	0.94 (0.07)	0.420	[0.81– 1.09]	1.05 (0.08)	0.519	[0.91– 1.21]	1.04 (0.08)	0.568	[0.9– 1.21]
State has expanded Medicaid	1.85 (0.16)	0.000	[1.57– 2.19]	1.3 (0.12)	0.005	[1.08– 1.57]	1.89 (0.16)	0.000	[1.6– 2.23]	1.81 (0.15)	0.000	[1.54– 2.14]
Region: Northeast	3.79 (0.56)	0.000	[2.83– 5.08]	3.07 (0.47)	0.000	[2.27– 4.13]	2.76 (0.43)	0.000	[2.03– 3.74]	3.94 (0.58)	0.000	[2.94– 5.26]
Region: Midwest	2.47 (0.24)	0.000	[2.04– 3]	1.92 (0.21)	0.000	[1.56– 2.37]	1.9 (0.2)	0.000	[1.55– 2.34]	2.48 (0.25)	0.000	[2.05– 3.01]
Region: West	1 (0.11)	0.966	[0.81– 1.24]	0.92 (0.1)	0.427	[0.74– 1.14]	0.79 (0.09)	0.035	[0.63– 0.98]	1.03 (0.11)	0.765	[0.84– 1.28]
Public comparison (probably to include as appendix)												
<i>Continuous key variable N = 4,622 counties with general medical centers</i>												
	Unemployed			Uninsured			Poor/Fair Health			Purchasing power/Adjusted median income		
	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int	OR (SE)	P	95% Conf Int
key variable	0.98 (0.03)	0.436	[0.92– 1.04]	0.99 (0.01)	0.451	[0.97– 1.02]	1 (0.01)	0.861	[0.98– 1.03]	1 (0)	0.702	[0.99– 1.01]

<i>Continuous key variable N = 4,622 counties with general medical centers</i>												
Hospitals in market (adjusted for population)	1.45 (0.08)	0.000	[1.29–1.62]	1.46 (0.08)	0.000	[1.31–1.64]	1.46 (0.08)	0.000	[1.3–1.63]	1.46 (0.08)	0.000	[1.3–1.64]
County percent white	1 (0)	0.274	[0.99–1]	1 (0)	0.276	[0.99–1]	1 (0)	0.316	[0.99–1]	1 (0)	0.290	[0.99–1]
Rural location	1.9 (0.21)	0.000	[1.53–2.35]	1.9 (0.21)	0.000	[1.53–2.35]	1.87 (0.21)	0.000	[1.5–2.32]	1.9 (0.22)	0.000	[1.52–2.38]
Hospital part of system	0.16 (0.01)	0.000	[0.14–0.19]	0.16 (0.01)	0.000	[0.14–0.19]	0.16 (0.01)	0.000	[0.14–0.19]	0.16 (0.01)	0.000	[0.14–0.19]
Teaching hospital	1.94 (0.43)	0.003	[1.26–3]	1.95 (0.43)	0.003	[1.26–3.01]	1.94 (0.43)	0.003	[1.26–3]	1.95 (0.43)	0.003	[1.26–3.01]
Bed size: 50–199	0.62 (0.06)	0.000	[0.5–0.75]	0.61 (0.06)	0.000	[0.5–0.75]	0.62 (0.06)	0.000	[0.5–0.75]	0.62 (0.06)	0.000	[0.5–0.75]
Bed size: 200–399	0.55 (0.09)	0.000	[0.41–0.75]	0.55 (0.09)	0.000	[0.41–0.75]	0.55 (0.09)	0.000	[0.41–0.75]	0.55 (0.09)	0.000	[0.41–0.75]
Bed size: greater than 400	0.9 (0.18)	0.616	[0.61–1.34]	0.91 (0.18)	0.629	[0.61–1.35]	0.91 (0.18)	0.627	[0.61–1.34]	0.91 (0.18)	0.627	[0.61–1.34]
State has CON law	1.26 (0.12)	0.019	[1.04–1.52]	1.23 (0.12)	0.037	[1.01–1.49]	1.24 (0.12)	0.025	[1.03–1.5]	1.25 (0.12)	0.022	[1.03–1.51]
State has expanded Medicaid	0.71 (0.08)	0.002	[0.58–0.88]	0.67 (0.08)	0.001	[0.53–0.85]	0.7 (0.07)	0.001	[0.57–0.86]	0.7 (0.07)	0.001	[0.57–0.87]
Region: Northeast	0.23 (0.05)	0.000	[0.15–0.37]	0.23 (0.05)	0.000	[0.14–0.36]	0.24 (0.06)	0.000	[0.15–0.39]	0.24 (0.05)	0.000	[0.15–0.37]
Region: Midwest	0.69 (0.09)	0.004	[0.54–0.89]	0.67 (0.09)	0.004	[0.52–0.88]	0.71 (0.1)	0.014	[0.55–0.93]	0.7 (0.09)	0.005	[0.54–0.9]
Region: West	1.17 (0.16)	0.250	[0.89–1.53]	1.16 (0.16)	0.287	[0.88–1.52]	1.19 (0.17)	0.242	[0.89–1.58]	1.18 (0.16)	0.236	[0.9–1.54]

For-profit hospitals have significantly lower odds of being in markets where there are more hospitals, of being in rural areas, or of being in regions outside the South. State regulations are also associated with for-profit hospital presence; for-profit hospitals have significantly lower odds of being in states with certificate-of-need laws or of being in states that have expanded Medicaid. Certain hospital characteristics were also significant, with for-profit hospitals having lower odds of being teaching hospitals or having 400 or more beds and higher odds of being a part of a multi-hospital system.

[Table 2 about here]

Discussion:

The aim of this study was to assess whether for-profit hospitals are more likely than other hospitals to operate in counties with significant health and economic needs. Our findings provide insights into the geographic distribution of for-profit hospitals and suggest that for-profit hospitals could have a disproportionate impact on population health if they engaged in population health investments in U.S. communities. Although previous research suggested that for-profit hospitals often seek out counties where they can hold significant market share and provide profitable healthcare services (16,18,28,36–38), we find that the majority of for-profit hospitals in the United States are located in counties where nonprofit hospitals are also operating. We do find important

regional differences, however, and observe lower for-profit presence in states that have certificate-of-need laws and that have expanded Medicaid.

At their core, both nonprofit and for-profit hospitals are privately held corporations, but much of the previous literature has focused on the potential contributions that nonprofits make to their local communities as a result of community benefit requirements in exchange for the tax exemption that these hospitals receive. For-profit hospitals, by contrast, pay taxes and may disperse their revenue streams to investors and leadership (39). However, our findings suggest that for-profits are likely to have an even greater opportunity to impact population health based on their location in counties with significant economic and health needs. Given higher rates of uninsurance and unemployment as well as lower income in counties containing for-profit hospitals, for-profit hospitals could or very well may serve as economic anchors in the same way as their nonprofit counterparts do: by providing jobs to local residents, by incentivizing their employees to live nearby and support the local economy, and through the acquisition of hospital supplies from local businesses (40).

Although data are not currently available to ascertain the specific investments that for-profit hospitals undertake to improve local population health, our findings underscore the potential for for-profit hospitals to greatly benefit the communities in which they are located and the need for better data on population health investments. Following previous research on community health investments, the tax status of hospitals may not be the only or most important factor in assessing their potential contributions to population health (16,17,29). Given that the effectiveness of community benefit laws for nonprofit hospitals remain disputed (30,41,42) policymakers might consider alternative mechanisms to both report the contributions that for-profit hospitals make to their surrounding communities (41) and incentivize anchor activities to reduce health disparities, especially in urban areas where for-profit hospitals are most likely to be located.

Limitations:

Our findings may be limited by the use of counties as a proxy for the community served by a hospital. While county statistics do provide context for the environment within which a hospital operates, a hospital's primary service area may not reach the full county or may extend beyond it limiting our ability to understand what impact for-profit hospitals may have on the broader community. Because our data are cross-sectional, we cannot assess whether the presence of a for-profit hospital contributes to poor economic or health outcomes or whether for-profit hospitals may identify markets with these characteristics as better suited for their organizations.

Conclusion:

For-profit hospitals are disproportionately likely to be located in counties with significant economic and physical health needs. As such, there is substantial opportunity for for-profit hospitals to serve as anchor institutions in many U.S. communities, despite this label more traditionally being applied to nonprofit hospitals. Although for-profit hospitals do not have the same federal tax requirements to contribute to community health and well-being, there are significant financial incentives to contribute to population health improvement. Given that there is not currently a regular reporting mechanism for documenting the community health contributions of for-profit hospitals, policymakers and researchers should evaluate the current state of these contributions and develop incentives to encourage more anchor activities to benefit economically vulnerable communities in the U.S.

Abbreviations

AHA
American Hospital Association

Declarations

Availability of data and Materials

The datasets generated and analyzed in this study are available from the following publicly available sources:

- United States Census American Community Survey (2017): <https://data.census.gov/cedsci/>
- Area Health Resource File (2017): <https://data.hrsa.gov/data/download>
- Mercatus Center: <https://www.mercatus.org/publications/corporate-welfare/state-certificate-need-laws-2016>
- Kaiser Family Foundation: <https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/>
- US Census Bureau Current Population Survey and Council for Community and Economic Research, congregated by advisorperspectives.com: <https://www.advisorperspectives.com/dshort/updates/2019/12/19/median-household-purchasing-power-for-the-50-states-and-dc>

The current study also generated and analyzed data from the American Hospital Association Annual Survey (2018), which are available for purchase from <https://www.aha.org/data-insights/aha-data-products>.

Ethics approval and consent to participate

Not applicable

Consent to publish

Not applicable

Competing interests

The authors declare that they have no competing interests.

Funding

This study was supported by the Robert Wood Johnson Foundation. This funding supported access to the American Hospital Association Annual Survey, the primary source of data for this study.

Authors' contributions

CEC, BF, and BG contributed to the conceptualization of the study. CEC and VR organized and managed data. CEC performed the statistical analysis. CEC, BF, KC wrote the initial draft of the manuscript. All authors contributed to manuscript writing and editing and approved the final draft of the manuscript.

Acknowledgements

We wish to thank the Robert Wood Johnson Foundation for their support of this project.

References

1. Mays GP, Mamaril CB, Timsina LR. Preventable death rates fell where communities expanded population health activities through multisector networks. *Health Aff.* 2016;35(11):2005–13.
2. American Hospital Association. Fast Facts on U.S. Hospitals [Internet]. 2020 [cited 2020 Jul 20]. Available from: <https://www.aha.org/statistics/fast-facts-us-hospitals>
3. Rozier MD, Singh SR, Jacobson PD, Prosser LA. Priorities for Investing in Community Health Improvement. *J Public Heal Manag Pract* [Internet]. 2019 Jul 1 [cited 2020 Jul 20];25(4):322–31. Available from: <http://journals.lww.com/00124784-201907000-00004>
4. Corrigan J, Fisher E, Heiser S. Hospital community benefit programs: Increasing benefits to communities [Internet]. Vol. 313, *JAMA - Journal of the American Medical Association*. American Medical Association; 2015 [cited 2020 Jul 20]. p. 1211–2. Available from: <http://www.hilltopinstitute.org/publications>

5. Cronin CE. The prevalence of community benefit participation in the hospital region and its relationship to community health outcomes. *J Health Hum Serv Adm.* 2017;40(1 (Summer 2017)):98–132.
6. Zuckerman D, Sparks J, Dubb S, Howard T. *Hospitals Building Healthier Communities embracing the anchor mission.* Tacoma Park, MD; 2013.
7. Norris T, Howard T. Can Hospitals Heal America's Communities? [Internet]. 2015. Available from: <http://democracycollaborative.org/content/can-hospitals-heal-americas-communities-0>
8. Franz B, Skinner D, Kerr AM, Penfold R, Kelleher K. Hospital–Community Partnerships: Facilitating Communication for Population Health on Columbus' South Side. *Health Commun.* 2018 Dec 2;33(12):1462–74.
9. Corbett J, Kappagoda M. Doing Good and Doing Well: Corporate Social Responsibility in Post Obamacare America. *J Law, Med Ethics* [Internet]. 2013 Apr 1 [cited 2020 Jul 20];41(1_suppl):17–21. Available from: <http://journals.sagepub.com/doi/10.1111/jlme.12032>
10. Koh HK, Bantham A, Geller AC, Emmons KM, Yatsko P, Rukavina MA, et al. Anchor institutions: Best practices to address social needs and social determinants of health [Internet]. Vol. 110, *American Journal of Public Health.* American Public Health Association Inc.; 2020 [cited 2020 Jul 20]. p. 309–16. Available from: <http://ajph.aphapublications.org/>
11. John Parrillo A, de Socio M, Socio de. Universities and Hospitals as Agents of Economic Stability and Growth in Small Cities: A Comparative Analysis. Vol. 11, *The Industrial Geographer.* 2014.
12. Skinner D, Gardner W, Kelleher KJ. When hospitals join the community: Practical considerations and ethical frameworks. *J Health Care Poor Underserved.* 2016 Aug 1;27(3):1171–82.
13. Louis Taylor H, Luter G. *Anchor Institutions: An Interpretive Review Essay* 2013. 2013.
14. Devereaux PJ, Choi P, Lacchetti C, Weaver B, Schünemann HJ, Haines T. A systematic review and meta-analysis of studies comparing mortality rates of private for-profit and private not-for-profit hospitals. Vol. 28, C. 2002.
15. Hirth RA. Competition between for-Profit and Nonprofit Health Care Providers: Can it Help Achieve Social Goals? *Med Care Res Rev* [Internet]. 1997 Dec 18;54(4):414–38. Available from: <http://journals.sagepub.com/doi/10.1177/107755879705400402>
16. Horwitz JR. Making Profits And Providing Care: Comparing Nonprofit, For-Profit, And Government Hospitals. *Health Aff* [Internet]. 2005 May;24(3):790–801. Available from: <http://www.healthaffairs.org/doi/10.1377/hlthaff.24.3.790>
17. Horwitz JR, Nichols A. Hospital ownership and medical services: Market mix, spillover effects, and nonprofit objectives. *J Health Econ.* 2009 Sep;28(5):924–37.
18. Horwitz JR, Nichols A. Rural hospital ownership: Medical service provision, market mix, and spillover effects. *Health Serv Res.* 2011 Oct;46(5):1452–72.
19. Shortell SM, Morrison EM, Hughes SL, Friedman B, Coverdill J, Berg L. The effects of hospital ownership on nontraditional services. *Health Aff.* 1986 Jul 24;5(4):97–111.
20. Bolon DS. Comparing mission statement content in for-profit and not-for-profit hospitals: does mission really matter? *Hosp Top* [Internet]. 2005 [cited 2020 Jul 20];83(4):2–9. Available from: <https://www.tandfonline.com/action/journalInformation?journalCode=vhos20>
21. Meier KJ, Johnson AP, An SH. Perceptual Bias and Public Programs: The Case of the United States and Hospital Care. *Public Adm Rev.* 2019 Nov 1;79(6):820–8.
22. Cram P, Bayman L, Popescu I, Vaughan-Sarrazin MS, Cai X, Rosenthal GE. Uncompensated care provided by for-profit, not-for-profit, and government owned hospitals. *BMC Health Serv Res.* 2010;10.
23. Duggan MG. Hospital Ownership and Public Medical Spending. *Q J Econ* [Internet]. 2000 Nov 1 [cited 2020 Jul 20];115(4):1343–73. Available from: <https://academic.oup.com/qje/article-lookup/doi/10.1162/003355300555097>
24. Hultman CI. Uncompensated Care before and after Prospective Payment: The Role of Hospital Location and Ownership. *Health Serv Res.* 1991;26(5):613–22.
25. Norton EC, Staiger DO. How hospital ownership affects access to care for the uninsured. Vol. 25, *RAND Journal of Economics.* 1994.

26. Clement JP, White KR, Valdmanis V. Charity Care: Do Not-for-Profits Influence for-Profits? *Med Care Res Rev* [Internet]. 2002 Mar 19;59(1):59–78. Available from: <http://journals.sagepub.com/doi/10.1177/1077558702059001003>
27. Valdovinos E, Le S, Hsia RY. In California, not-for-profit hospitals spent more operating expenses on charity care than for-profit hospitals spent. *Health Aff* [Internet]. 2015 [cited 2020 Jul 20];34(8):1296–303. Available from: <https://pubmed.ncbi.nlm.nih.gov/26240242/>
28. McCue MJ. A Market, Operation, and Mission Assessment of Large Rural For-Profit Hospitals With Positive Cash Flow. *J Rural Heal* [Internet]. 2007 Jan 1 [cited 2020 Jul 20];23(1):10–6. Available from: <http://doi.wiley.com/10.1111/j.1748-0361.2006.00062.x>
29. David G. The convergence between for-profit and nonprofit hospitals in the United States. *Int J Health Care Finance Econ*. 2009 Dec;9(4):403–28.
30. Nicholson S, Pauly M V., Burns LR, Baumritter A, Asch DA. Measuring community benefits provided by for-profit and nonprofit hospitals. *Health Aff*. 2000 Dec 13;19(6):168–71.
31. Shortell SM, Hughes EF x. The Effects of Regulation, Competition, and Ownership on Mortality Rates among Hospital Inpatients. *N Engl J Med* [Internet]. 1988 Apr 28 [cited 2020 Jul 20];318(17):1100–7. Available from: <http://www.nejm.org/doi/abs/10.1056/NEJM198804283181705>
32. Chiu RG, Murphy BE, Rosenberg DM, Zhu AQ, Mehta AI. Association of for-profit hospital ownership status with intracranial hemorrhage outcomes and cost of care. *J Neurosurg*. 2019 Dec 14;1–9.
33. Koopman C, Philpot A. The State of Certificate-of-Need Laws in 2016 [Internet]. Mercatus Center. 2016 [cited 2020 Jul 20]. Available from: <https://www.mercatus.org/publications/corporate-welfare/state-certificate-need-laws-2016>
34. Kaiser Family Foundation. Status of State Medicaid Expansion Decisions: Interactive Map [Internet]. 2020 [cited 2020 Jul 20]. Available from: <https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/>
35. Mislinski J. Median Household Purchasing Power for the 50 States and DC [Internet]. Advisor Perspectives. 2019 [cited 2020 Jul 20]. Available from: <https://www.advisorperspectives.com/dshort/updates/2019/12/19/median-household-purchasing-power-for-the-50-states-and-dc>
36. Lee S, Chung CY, Sul HK, Lee Y. Determinants of market share of for-profit hospitals: An empirical examination. *Soc Sci*. 2017 Oct 3;6(4).
37. Paul JA, Quosigk B, MacDonald L. Does Hospital Status Affect Performance? *Nonprofit Volunt Sect Q*. 2020 Apr 1;49(2):229–51.
38. Sloan FA, Picone GA, Taylor DH, Chou S-Y. Hospital ownership and cost and quality of care: is there a dime's worth of difference? Vol. 20, *Journal of Health Economics*. 2001.
39. GWU School of Business. For Profit vs. Nonprofit Hospital Administration [Internet]. The George Washington University School of Business Blog. 2020 [cited 2020 Jul 20]. Available from: <https://healthcaremba.gwu.edu/blog/profit-vs-nonprofit-hospital-administration/>
40. Franz B, Skinner D, Wynn J, Kelleher K. Urban Hospitals as Anchor Institutions: Frameworks for Medical Sociology. *Socius Sociol Res a Dyn World*. 2019 Jan;5:237802311881798.
41. Ginn GO, Moseley CB. The Impact of State Community Benefit Laws on the Community Health Orientation and Health Promotion Services of Hospitals. *J Health Polit Policy Law* [Internet]. 2006 Apr;31(2):321–44. Available from: <https://read.dukeupress.edu/jhppl/article/31/2/321-344/93476>
42. Herring B, Gaskin D, Zare H, Anderson G. Comparing the value of nonprofit hospitals' tax exemption to their community benefits. *Inq (United States)*. 2018 Jan 1;55.

Figures

Figure 1

Title: Geographic distribution of for profit hospital beds in the US Legend: Using the percentage of beds in a county that were in for profit hospitals, this map indicates where for profit hospitals are most likely to operate. Darker colors on the map indicate a higher percentage of for profit beds.

Figure 2

Title: County Characteristics Associated with Hospital Type Legend: Using descriptive statistics, this figure shows whether different types of hospitals are located in counties with significant health and economic needs. For profit general medical centers are located in counties with higher unemployment, uninsurance, and poor/fair physical health than other hospital types.

Figure 3

Title: County Income Associated with Hospital Type Legend: Using descriptive statistics, this figure shows the average county income (adjusted for purchasing power) where different types of hospitals are located. Counties with public hospitals have the lowest average income; counties with for profit hospitals have lower average income than counties with non profit hospitals.