The Magnitude of a Community's Health Needs and Nonprofit Hospitals' Progress in Meeting Those Needs: Are We Faced With a Paradox?

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Abstract

Objectives: Although most nonprofit hospitals are required to conduct periodic community health needs assessments (CHNAs), such assessments arguably are most critical for communities with substantial health needs. The objective of this study was to describe differences in progress in conducting CHNAs between hospitals located in communities with the greatest compared with the fewest health needs.

Methods: We used data on CHNA activity from the 2013 tax filings of 1331 US hospitals combined with data on community health needs from the County Health Rankings. We used bivariate and multivariate analyses to examine differences in hospitals' progress in implementing comprehensive CHNAs using 4 activities: (1) strategies to address identified needs, (2) participation in developing community-wide plans, (3) including CHNA into a hospital's operational plan, and (4) developing a budget to address identified needs. We compared progress in communities with the greatest and the fewest health needs using a comprehensive indicator comprising a community's socioeconomic factors, health behaviors, access to medical care, and physical environment.

Results: In 2013, nonprofit hospitals serving communities with the greatest health needs conducted an average of 2.5 of the 4 CHNA activities, whereas hospitals serving communities with the fewest health needs conducted an average of 2.7 activities. Multivariate analysis, however, showed a negative but not significant relationship between the magnitude of a community's health needs and a hospital's progress in implementing comprehensive CHNAs.

Conclusions: Hospitals serving communities with the greatest health needs face high demand for free and reduced-cost care, which may limit their ability to invest more of their community benefit dollars in initiatives aimed at improving the health of the community.

Keywords

community health, community health needs assessment, nonprofit hospitals, Patient Protection and Affordable Care Act

The Patient Protection and Affordable Care Act requires that most nonprofit hospitals in the United States conduct periodic community health needs assessments (CHNAs) as a condition of their federal tax-exempt status.[1,2] Such assessments arguably are most critical for communities with substantial health needs. An in-depth assessment of the factors that drive a community's health needs, including socioeconomic factors, health behaviors, access to medical care, and the physical environment, can help hospital leadership identify and prioritize health needs and use available resources to address those needs effectively and efficiently. For communities with substantial health needs in which social factors play a prominent role, such assessments can serve as the

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impetus for coordinating community health activities across stakeholders to address these factors and improve the health status of the population.[3,4] Research indicates that the CHNA requirements are motivating hospitals to develop new community-based partnerships, particularly in medically underserved areas.[5-9]

At the same time, research suggests a paradox: hospitals in communities where health needs are likely to be greatest may be making the least progress in addressing those needs, whereas hospitals in communities with the fewest health needs are making the most progress. Several studies found that hospitals serving lower-income communities tend to spend relatively more resources (eg, financial, staff member time) on providing patient-level community benefits, such as charity care and other subsidized health services, and relatively fewer resources on supporting broader community health initiatives aimed at addressing disease prevention and health promotion.[10-12]

The objective of this study was to describe differences in progress in conducting CHNAs between hospitals in communities with the greatest health needs and hospitals in communities with the fewest health needs. We hypothesized that hospitals in communities with the greatest health needs were making less progress in implementing comprehensive CHNAs than were hospitals in communities with the fewest health needs.

Methods

Data and Sample

We collected data for this study from several sources. Data on hospitals' progress in conducting comprehensive CHNAs came from filings from Internal Revenue Service (IRS) Form 990 Schedule H (hereinafter, Schedule H).[13] All hospitals with a federal tax exemption are required to complete Schedule H, and almost all nonprofit hospitals have a federal tax exemption. We obtained data from Schedule H for the year 2013, which are not published by the IRS, under a purchasing agreement from GuideStar (www.guidestar.org). Data on community health needs came from the County Health Rankings & Roadmaps Project of the University of Wisconsin.[14] We obtained additional data on the institutional, community, and market characteristics of the hospitals from the American Hospital Association (unpublished data), the Centers for Medicare & Medicaid Services,[15] and the Area Health Resource File.[16] All data were for 2013. The unit of analysis was the hospital. For each hospital, we merged data on community health needs and other institutional, community, and market characteristics with hospital-level data based on the county in which the hospital was located.

The study population comprised all tax-exempt, acute-care hospitals that filed Schedule H for 2013. We obtained data for 1593 tax-exempt hospitals, which accounted for approximately 55% of all 2893 nonprofit hospitals in the United States in 2013. The remaining 1300 (45%)

tax-exempt hospitals comprised those that were members of hospital systems that filed a consolidated Schedule H under an IRS group filing exemption. We compared the 2 groups of hospitals (eg, those that filed an individual Schedule H and those that were covered by a group exemption) by hospital-level characteristics (ie, number of beds, teaching status) and found them to be similar, except that hospitals that were members of hospital systems were underrepresented among hospitals that filed an individual Schedule H. The final sample included 1331 tax-exempt hospitals (Table 1). We excluded 262 hospitals for which we did not have complete data on the hospitals' community health needs from the County Health Rankings.

Measures

The dependent variable of interest was a hospital's progress in conducting a comprehensive CHNA. To measure a hospital's progress, we followed published research for developing a summary index using data from Schedule H.[17] Our summary index consisted of 4 activities related to CHNA activities: (1) strategy formulation to address identified needs, (2) participation in the development of community-wide plans, (3) inclusion of CHNA into a hospital's operational plan for community benefits, and (4) development of a budget to address identified needs. Hospitals were required to report whether they had undertaken each activity on the 2013 Schedule H. Each activity was coded as a binary variable, where 1 indicated that a hospital completed the respective activity in 2013 and 0 indicated that a hospital did not complete the respective activity in 2013. Using these 4 binary variables, we computed a CHNA summary index, which was defined as the unweighted sum of the 4 activities. The CHNA summary index took on values from 0 (for hospitals that did not engage in any of the 4 activities) to 4 (for hospitals that engaged in all 4 activities).

The independent variable was a comprehensive indicator of the health needs of the community served by each hospital. To create this indicator, we obtained data for 2013 from the County Health Rankings & Roadmaps project on 22 of 25 key measures of a community's socioeconomic factors, health behaviors, access to medical care, and physical environment for 882 counties in the sample. Measures of a community's socioeconomic factors included the proportion of the population with at least some college education, the unemployment rate, the proportion of children in poverty, the proportion of community residents with inadequate social support, and the proportion of children in single-parent households. Measures of a community's health behaviors included the adult smoking rate, the adult obesity rate, the excessive drinking rate, the motor vehicle crash death rate, and the teen birth rate. Measures of a community's access to medical care included the uninsured rate, the supply of primary care physicians, the supply of dentists, the number of preventable hospital stays, diabetic screening rates, and mammography screening rates. Measures of a

community's physical environment included indicators of air pollution, drinking water violations, limited access to healthy foods, fast-food restaurants, and access to recreational facilities. We excluded data for 3 measures (sexually transmitted infections rate, high school graduation rate, and violent crime rate) for which the County Health Rankings & Roadmaps project deemed the available data for a measure not comparable across states because of how the measures are defined and the data are collected.

We used the 22 measures included in this study to compute a comprehensive community health needs indicator for each of the 882 counties in our sample. For each measure, we performed the following standardization: We computed a z score by taking the difference between the county value and the sample mean value and dividing the result by the sample standard deviation. Then, we converted all z scores so that a higher score indicated greater health needs across all measures. Finally, we used the z scores to compute a community health needs indicator for every county in our sample. To weight the individual measures, we recalibrated the weights used in the 2013 County Health Rankings & Roadmaps project to adjust for the exclusion of 3 measures from our analysis. The values for our comprehensive community health needs indicator ranged from –1.47 to 2.07 (mean = 0.03, median = 0.04). Counties with the greatest health needs were defined as counties in the bottom quartile (ie, counties with a value for the comprehensive community health needs indicator of –0.47 or lower). Counties with the fewest health needs were defined as counties in the top quartile (ie, counties with a value for the comprehensive community health needs indicator of 0.35 or higher).

Analysis

We conducted bivariate analysis of variance to compare hospitals' progress in conducting comprehensive CHNAs across communities, which were divided into 4 quartiles based on the magnitude of their health needs. The 4 quartiles were counties with the greatest health needs (comprehensive community health needs indicator between –1.47 and –0.47), counties with substantial health needs (comprehensive community health needs indicator between –0.46 and 0.03), counties with moderate health needs (comprehensive community health needs indicator between 0.04 and 0.34), and counties with the fewest health needs (comprehensive community health needs indicator between 0.35 and 2.07).

We performed multivariate logistic regression analysis to examine the relationship between hospitals' progress in conducting each of the 4 CHNA activities and the magnitude of community health needs. We also performed multivariate ordinary least squares regression analysis to examine the relationship between hospitals' progress in conducting comprehensive CHNAs and the magnitude of community health needs. The regression analyses controlled for a set of hospital-level institutional, community, and market characteristics as used in previous research.[10,12,13] Hospital-level

control variables included number of beds, case mix index (ie, the average diagnosis-related group weight for all Medicare patients at each hospital), profitability, system affiliation (ie, member of a corporate entity that owns at least 2 hospitals), network affiliation (ie, participated in a strategic alliance or joint venture with at least 1 hospital), church affiliation (ie, owned and operated by a religious organization), teaching status (ie, member of the Council of Teaching Hospitals), whether the hospital was contract managed (ie, had in place a contractual relationship with an outside company to manage its operations), whether the hospital was a sole community provider (ie, met at least 1 of several criteria [eg, located at least 35 miles from other similar hospitals]), and whether the hospital was a member of an accountable care organization. Accountable care organization participation was defined as participation by a hospital in the Medicare Shared Savings Program or Pioneer accountable care organization initiative.

Community and market-level control variables included market competition (measured by the Herfindahl-Hirschman Index),[18,19] wage index, the percentage of hospital beds in the community operated by for-profit hospitals, the percentage of hospital beds in the community operated by government hospitals, and urban/rural location. Market competition was measured in accordance with the Herfindahl-Hirschman Index,[18,19] which we computed by summing the squared values of each hospital's proportion of total hospital patients admitted to general, acute-care hospitals within its market (defined as county). We classified hospitals as urban if they were located within a metropolitan statistical area and rural if they were located outside of a metropolitan statistical area.

The regression analyses also included state fixed effects to account for circumstances in each state that may affect hospitals' progress in implementing comprehensive CHNAs, such as state requirements for hospitals to conduct CHNAs for exemption from state and local taxes. We used t tests to test the significance of the regression coefficients. We considered $P < .05$ to be significant. All analyses were conducted using Stata version 14.[20]

Results

Hospitals' progress in implementing comprehensive CHNAs varied substantially. Of 1331 hospitals in the sample, 1197 (90%) reported that, by 2013, they had undertaken at least 1 of the 4 CHNA activities, but only 509 (38%) hospitals reported that they had completed all 4 activities. On average, sample hospitals had completed 2.6 of the 4 activities examined in this study (Table 2). Among the 1131 hospitals, the most frequently reported CHNA activity was adopting a strategy to address the health needs identified through the CHNA (1140 hospitals, 86%), followed by participation in a community-wide plan (804 hospitals, 60%), budget development (728 hospitals, 55%), and operational planning (753 hospitals, 57%).

Table 1. Characteristics of 1331 nonprofit US hospitals in a study of community health needs assessment, 2013[a]

Characteristic	Study Sample[b] (n = 1331)
Institutional characteristics	
No. of beds, median (IQR)	129 (52-256)
Case mix index,[c] mean (SD)	1.44 (0.21)
Profitability[d]	
High profit margin	713 (54)
Normal profit margin	267 (20)
Negative profit margin	351 (26)
System affiliation[e]	
Yes	709 (53)
No	622 (47)
Network affiliation[f]	
Yes	488 (37)
No	843 (63)
Teaching hospital[g]	
Yes	84 (6)
No	1247 (94)
Contract-managed hospital[h]	
Yes	120 (9)
No	1211 (91)
Church-affiliated hospital[i]	
Yes	188 (14)
No	1143 (86)
Sole community provider[j]	
Yes	86 (6)
No	1245 (94)
Member of an ACO[k]	
Yes	305 (23)
No	1026 (77)
Community and market characteristics	
Market competition,[l] median (IQR)	0.52 (0.27-1.00)
Wage index,[m] median (IQR)	1.04 (0.90-1.41)
% of hospital beds in the county operated by for-profit hospitals, median (IQR)	0.0 (0.0-5.2)
% of hospital beds in the county operated by government hospitals, median (IQR)	0.0 (0.0-0.0)
Location[n]	
Urban	784 (59)
Rural	547 (41)

Abbreviations: ACO, accountable care organization; IQR, interquartile range.

[a]Sources: Internal Revenue Service 2013 Form 990 Schedule H[13]; County Health Rankings & Roadmaps project[14]; American Hospital Association Annual Survey (unpublished); Centers for Medicare & Medicaid Services[15]; 2013 Area Health Resource File[16]; and proprietary ACO data from government documents, a database from a consulting firm that tracks such data (Leavitt Partners), and the authors' own primary data collection.

[b]All values are No. (%) unless otherwise indicated. Percentages are for categorical variables; medians and IQRs are for continuous variables.

[c]Case mix index is the average diagnosis-related group weight for a hospital's Medicare patients. Hospitals with case mix values >1 have patients whose diagnoses are relatively more resource intensive than the national average. Hospitals with index values <1 have patients whose diagnoses are relatively less resource intensive than the national average (a value of 1).

[d]Profit margin was computed by subtracting a hospital's operating costs from its operating revenue and dividing the result by the operating revenue: margins >3% = high profit, normal profit is between 0% and 3%, and margins ≤0% = negative profit margins.

[e]System affiliation refers to hospitals that were members of a corporate entity that owns 2 or more hospitals (ie, multihospital system).

[f]Network affiliation refers to hospitals that participated in a strategic alliance or joint venture with 1 or more hospitals. These arrangements do not entail common ownership of the participating hospitals.

[g]Hospitals were classified as teaching if they were members of the Council of Teaching Hospitals.

[h]Contract managed refers to a hospital that contracted with an outside company to manage its operations.

[i]Church affiliation refers to hospitals that were owned and operated by a religious organization.

[j]Sole community provider is a designation under the Medicare program for hospitals that meet at least 1 of several criteria (eg, located at least 35 miles from other like hospitals).

[k]ACO participation was defined as participation by a hospital in the Medicare Shared Savings Program or Pioneer ACO initiative.

[l]Market competition was measured in accordance with the Herfindahl-Hirschman Index (HHI),[18,19] which was computed by summing the squared values of each hospital's proportion of total hospital patients admitted to general, acute-care hospitals within its market (defined as county). The theoretical range for the HHI is 0 to 1, where 1 indicates a monopoly (ie, 1 firm in the market). For example, if there are 2 hospitals in a market, 1 with .25 share of total admissions and the other with .75 share of the admissions, the HHI would be .625 ($.25^2 + .75^2$).

[m]The Medicare wage index reflects geographic differences in hospital wage levels. A hospital's index value reflects the wage level for its geographic area compared with the national average.

[n]Hospitals classified as urban were located within a metropolitan statistical area.

Table 2. Nonprofit US hospitals' progress in implementing federal community health needs assessment (CHNA) requirements, overall and by quartile of health needs of the community served, 2013

CHNA Activity	All Hospitals, No. (%) (n = 1331)	Quartile,[a] No. (%)				ANOVA P Value
		Quartile 1 (n = 332)	Quartile 2 (n = 334)	Quartile 3 (n = 332)	Quartile 4 (n = 333)	
Strategy adoption	1140 (86)	288 (87)	298 (89)	277 (83)	277 (83)	.08
Participation in community-wide plan	804 (60)	209 (63)	215 (64)	201 (61)	179 (54)	.03[b]
Operational planning	728 (55)	197 (59)	177 (53)	171 (52)	183 (55)	.20
Budget development	753 (57)	204 (61)	192 (57)	176 (53)	181 (54)	.13
CHNA summary index	2.6 (1.4)	2.7 (1.4)	2.6 (1.3)	2.5 (1.4)	2.5 (1.4)	.07

Abbreviation: ANOVA, analysis of variance.
[a]Quartiles were determined according to assessments of community health needs; Quartile 1 was determined to have the fewest health needs, and Quartile 4, the greatest health needs.
[b]Significant at $P < .05$.

Bivariate analysis showed that hospitals in communities with the greatest health needs had made the least progress in implementing comprehensive CHNAs and hospitals in communities with the fewest health needs had made the most progress (Table 2). However, the difference in the average number of CHNA activities undertaken between hospitals serving communities with the fewest health needs (2.7 activities) and hospitals serving communities with the greatest health needs (2.5 activities) was small. When examining the 4 CHNA activities separately, only 1—participation in a community-wide plan—differed significantly across hospitals serving communities of varying health needs. A total of 209 of 332 (63%) hospitals serving communities with the fewest health needs compared with 179 of 333 (54%) hospitals serving communities with the greatest health needs participated in a community-wide plan.

Consistent with our bivariate findings, multivariate regression analysis showed either no relationship or a negative relationship between the extent of a community's health needs and a hospital's progress in implementing comprehensive CHNAs. Logistic regression analysis showed a significant relationship between community health needs and 1 of the 4 activities, strategy formulation (Table 3). The odds of adopting a strategy to address identified health needs were 0.67 and, thus, were lower for hospitals located in communities with greater health needs than for hospitals located in communities with fewer health needs. Ordinary least squares regression analysis showed a negative relationship (0.15) between the magnitude of a community's health needs and a hospital's progress in implementing comprehensive CHNAs (Table 4). For each 1-unit increase in a community's health index, the number of CHNA activities that a hospital located in that community would engage in decreased by 0.15. This relationship, however, was not significant ($P = .09$).

Other institutional characteristics associated with our indicators of hospital progress in CHNA implementation were hospitals' system affiliation and membership in an accountable care organization. Furthermore, we found 2 community and market characteristics to be associated with greater hospital progress in implementing comprehensive

CHNAs: nonprofit hospitals in less competitive markets had made more progress than nonprofit hospitals in more competitive markets, and nonprofit hospitals in markets with a greater proportion of beds controlled by for-profit hospitals had made more progress than nonprofit hospitals in markets with a smaller proportion of beds controlled by for-profit hospitals. Nonprofit hospitals in markets with a greater proportion of beds controlled by government hospitals made less progress on 1 aspect of CHNA implementation: adopting a strategy to address identified health needs.

Discussion

Why hospitals in communities with the greatest health needs lag behind hospitals in communities with the fewest health needs in implementing comprehensive CHNAs can be explained in several ways. One possible explanation is that hospitals in communities with the greatest health needs often face substantial demand for free and reduced-cost medical care. High spending on medical care services consumes resources that would otherwise be available to hospitals in these communities to address broader health-related socio-economic factors, including those identified through a comprehensive CHNA. Limited attention to the upstream social determinants of health, however, reduces the likelihood for communities to see meaningful improvements in the health of their residents. As a result, hospitals in these communities may be less likely than hospitals in communities with fewer health needs to be able to break the pattern of spending most of their community benefit dollars on charity care.

Another explanation is that hospitals located in communities with the greatest health needs lack the expertise needed to take on this additional requirement. A recent qualitative study of nonprofit hospitals in Appalachian Ohio, for example, found that nonprofit hospitals serving the least healthy communities faced several challenges that may relate to their status as rural hospitals.[7] Rural hospitals and small hospitals generally may face difficulties recruiting people with the appropriate credentials to conduct comprehensive CHNAs and may also lack the financial resources to hire consultants

Table 3. Multivariate logistic regression analysis of the relationship between community health needs and tax-exempt US hospitals' progress in implementing federal community health needs assessment requirements, 2013

	Odds Ratio (95% CI)[a]			
Indicator	**Strategy Adoption**	**Participation in Community-Wide Plan**	**Operational Planning**	**Budget Adoption**
Community health needs indicator	0.67[b] (0.44-0.99)	0.90 (0.68-1.19)	0.91 (0.69-1.20)	0.78 (0.59-1.04)
Institutional indicators				
No. of beds	1.00 (1.00-1.00)	1.00 (1.00-1.00)	1.00 (1.00-1.00)	1.00 (1.00-1.00)
Case mix index[c]	1.72 (0.55-5.41)	2.06 (0.90-4.71)	0.76 (0.35-1.66)	1.33 (0.61-2.92)
Profit margin[d]				
High	1.18 (0.75-1.87)	1.08 (0.78-1.49)	1.18 (0.86-1.61)	1.09 (0.80-1.49)
Negative	0.70 (0.44-1.13)	0.89 (0.62-1.28)	0.79 (0.56-1.17)	0.86 (0.61-1.21)
Normal	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
System affiliation[e]				
Yes	1.41 (0.49-2.10)	0.85 (0.64-1.12)	1.59[f] (1.21-2.07)	1.50[f] (1.15-1.96)
No	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
Network affiliation[g]				
Yes	1.02 (0.70-1.50)	1.01 (0.77-1.33)	1.21 (0.93-1.51)	1.13 (0.87-1.47)
No	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
Teaching hospital[h]				
Yes	0.58 (0.23-1.48)	0.88 (0.46-1.66)	1.03 (0.55-1.91)	0.69 (0.37-1.27)
No	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
Contract-managed hospital[i]				
Yes	0.87 (0.47-1.63)	1.03 (0.66-1.61)	0.82 (0.53-1.27)	0.70 (0.45-1.08)
No	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
Church-affiliated hospital[j]				
Yes	0.62 (0.37-1.09)	1.08 (0.74-1.59)	0.84 (0.58-1.21)	0.71 (0.49-1.03)
No	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
Sole community hospital[k]				
Yes	1.48 (0.69-3.19)	0.76 (0.44-1.33)	0.92 (0.54-1.58)	1.00 (0.58-1.70)
No	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
Member of ACO[l]				
Yes	1.53 (0.91-2.55)	1.31 (0.94-1.81)	1.46[b] (1.07-2.00)	1.19 (0.87-1.63)
No	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
Community and market indicators				
Market competition[m] (HHI)	1.22 (0.58-2.57)	1.67 (0.98-2.84)	1.60 (0.97-2.65)	1.73[b] (1.05-2.88)
Wage index[n]	1.00 (0.98-1.01)	0.99 (0.98-1.00)	0.98[f] (0.97-0.99)	0.98[f] (0.97-0.99)
% of hospital beds operated by for-profit hospitals	2.9 (0.58-11.62)	2.22 (0.75-6.55)	2.61 (0.89-7.62)	2.69 (0.39-7.77)
% of hospital beds operated by government hospitals	0.30[b] (0.11-0.84)	0.55 (0.23-1.31)	0.73 (0.31-1.73)	0.92 (0.39-2.17)

Table 3. (continued)

Indicator	Odds Ratio (95% CI)[a]			
	Strategy Adoption	**Participation in Community-Wide Plan**	**Operational Planning**	**Budget Adoption**
Location[o]				
Urban	1.30 (0.81-2.09)	0.91 (0.65-1.28)	1.10 (0.79-1.53)	1.06 (0.76-1.47)
Rural	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]	1.00 [Reference]
R^2	0.12	0.10	0.08	0.07

Abbreviations: ACO, accountable care organization; HHI, Herfindahl-Hirschman Index.

[a]Using logistic regression analyses, the odds ratios and 95% CIs presented can be interpreted as follows (using the coefficient on system affiliation in the first regression model as an example): the odds ratio is 1.41, which indicates that the odds of a study hospital adopting a strategy to address identified needs are 41% higher among system-affiliated hospitals than among freestanding hospitals.

[b]Significant at $P < .05$.

[c]Case mix index is the average diagnosis-related group weight for a hospital's Medicare patients. Hospitals with case mix values >1 have patients whose diagnoses are relatively more resource intensive than the national average. Hospitals with index values <1 have patients whose diagnoses are relatively less resource intensive than the national average, which is defined as a value of 1.

[d]Profit margin was computed by subtracting a hospital's operating costs from its operating revenue and dividing the result by the operating revenue: margins >3% = high profit, normal profit is between 0% and 3% and margins ≤0% = negative profit margins.

[e]System affiliation refers to hospitals that were members of a corporate entity that owns 2 or more hospitals (ie, multihospital system).

[f]Significant at $P < .01$.

[g]Network affiliation refers to hospitals that participated in a strategic alliance or joint venture with 1 or more hospitals. These arrangements do not entail common ownership of the participating hospitals.

[h]Hospitals were classified as teaching if they were members of the Council of Teaching Hospitals.

[i]Contract managed refers to a hospital that contracted with an outside company to manage its operations.

[j]Church affiliation refers to hospitals that were owned and operated by a religious organization.

[k]Sole community provider is a designation under the Medicare program for hospitals that meet at least 1 of several criteria (eg, located at least 35 miles from other like hospitals).

[l]ACO participation was defined as participation by a hospital in the Medicare Shared Savings Program or Pioneer ACO initiative.

[m]Market competition was measured in accordance with the HHI,[18,19] which was computed by summing the squared values of each hospital's proportion of total hospital patients admitted to general, acute-care hospitals within its market (defined as county). The theoretical range for the HHI is 0 to 1, where 1 indicates a monopoly (ie, 1 firm in the market). For example, if there are 2 hospitals in a market, 1 with .25 share of total admissions and the other with .75 share of the admissions, the HHI would be .625 ($.25^2 + .75^2$).

[n]The Medicare wage index reflects geographic differences in hospital wage levels. A hospital's index value reflects the wage level for its geographic area compared with the national average.

[o]Hospitals classified as urban were located within a metropolitan statistical area.

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Table 4. Multivariate ordinary least squares regression analysis of the relationship between community health needs and nonprofit US hospitals' progress in implementing federal community health needs assessment requirements, 2013

Indicator	Coefficient (95% CI) [P Value][a]
Community health needs indicator	−0.15 (−0.32 to 0.02)
Institutional indicators	
No. of beds	0.00 (−0.00 to 0.00)
Case mix index[b]	0.20 (−0.26 to 0.67)
Profitability[c]	
High profit margin	0.08 (−0.12 to 0.28)
Negative profit margin	−0.16 (−0.39 to 0.06)
System affiliation[d]	0.20[e] (0.02 to 0.37) [.03]
Network affiliation[f]	0.07 (−0.09 to 0.23)
Teaching hospital[g]	−0.15 (−0.54 to 0.23)
Contract-managed hospital[h]	−0.13 (−0.42 to 0.16)
Church-affiliated hospital[i]	−0.15 (−0.37 to 0.08)
Sole community hospital[j]	−0.04 (−0.37 to 0.30)
Member of ACO	0.22[e] (0.03 to 0.40) [.02]
Community and market indicators	
Market competition (HHI)[k]	0.35[e] (0.04 to 0.65) [.03]
Wage index[l]	−0.01[m] (−0.02 to −0.00) [.005]
% hospital beds operated by for-profit hospitals	0.71[e] (0.07 to 1.35) [.03]
% hospital beds operated by government hospitals	−0.39 (−1.02 to 0.24)
Urban location[n]	0.04 (−0.16 to 0.25)
R^2	0.13

Abbreviations: ACO, accountable care organization; HHI, Herfindahl-Hirschman Index.

[a]The coefficient and SEs can be interpreted as follows (using the coefficient on system affiliation as an example): the community health needs assessment summary index of system-affiliated hospitals was 0.2 points higher than that of freestanding hospitals (P = .025).

[b]Case mix index is the average diagnosis-related group weight for a hospital's Medicare patients. Hospitals with case mix values >1 have patients whose diagnoses are relatively more resource intensive than the national average. Hospitals with index values <1 have patients whose diagnoses are relatively less resource intensive than the national average, which is defined as a value of 1.

[c]Profit margin was computed by subtracting a hospital's operating costs from its operating revenue and dividing the result by the operating revenue. High profit margins were defined as margins >3%, and negative profit margins were defined as margins ≤0%.

[d]System affiliation refers to hospitals that were members of a corporate entity that owns 2 or more hospitals (ie, multihospital system).

[e]Significant at P < .05.

[f]Network affiliation refers to hospitals that participated in a strategic alliance or joint venture with 1 or more hospitals. These arrangements do not entail common ownership of the participating hospitals.

[g]Hospitals were classified as teaching if they were members of the Council of Teaching Hospitals.

[h]Contract managed refers to a hospital that contracted with an outside company to manage its operations.

[i]Church affiliation refers to hospitals that were owned and operated by a religious organization.

[j]Sole community provider is a designation under the Medicare program for hospitals that meet at least 1 of several criteria (eg, located at least 35 miles from other like hospitals).

[k]Market competition was measured in accordance with the HHI,[18,19] which was computed by summing the squared values of each hospital's proportion of total hospital patients admitted to general, acute-care hospitals within its market (defined as county). The theoretical range for the HHI is 0 to 1, where 1 indicates a monopoly (ie, 1 firm in the market). For example, if there are 2 hospitals in a market, 1 with .25 share of total admissions and the other with .75 share of the admissions, the HHI would be .625 ($.25^2 + .75^2$).

[l]The Medicare wage index reflects geographic differences in hospital wage levels. A hospital's index value reflects the wage level for its geographic area compared with the national average.

[m]Significant at P < .01.

[n]Hospitals classified as urban were located within a metropolitan statistical area.

to assist with developing high-quality, comprehensive CHNAs.[7,9] In addition, such hospitals may have fewer community partners with which to collaborate to develop CHNAs. Although we did not find significant differences in CHNA activities between urban and rural hospitals, we found that system-affiliated hospitals were more likely than freestanding hospitals to have conducted a comprehensive CHNA. Membership in a system and access to system-level resources and expertise may facilitate the implementation of comprehensive CHNAs, especially for smaller hospitals, as might collaborative agreements with community partners, such as the local health department.[21]

Limitations

This study had several limitations. First, we relied on hospitals' responses to 4 questions about CHNA implementation progress from Schedule H to measure hospitals' progress in implementing comprehensive CHNAs. Although these 4 activities represent important aspects of a CHNA, other activities (eg, whether or not a hospital has developed an implementation strategy and whether or not the hospital partners with community stakeholders in the execution of its implementation strategy) also determine hospitals' progress in implementing comprehensive CHNAs. Second, the results

were cross-sectional and represented a single year of data (2013), effectively the first year for which most nonprofit hospitals were required to conduct a CHNA. Since then, hospitals have conducted a second round of CHNAs, and progress toward implementing comprehensive CHNAs may have changed as hospitals engaged in their second rounds of CHNAs. Hospitals that did not engage in comprehensive CHNA efforts the first time around have likely had opportunities to learn and improve their efforts over time. Research is needed to explore trends in the comprehensiveness of hospitals' CHNA activities over time. Finally, our study did not include hospitals that were members of a hospital system that had a group exemption from the IRS. Although systems with a group exemption are supposed to provide CHNAs for each system member as part of their Schedule H, we did not obtain those data. A comparison of our study sample with the general population of nonprofit hospitals in the United States, however, found that these groups were similar, with the exception of system membership, for which the study sample slightly underrepresented the general population.

Conclusions

This study provides public health officials and policy makers with empirical evidence of the progress that nonprofit hospitals have made in conducting comprehensive CHNAs, especially in communities with the greatest health needs. Because hospitals in communities with the greatest health needs lag behind hospitals in communities with the fewest health needs in conducting comprehensive CHNAs, the support of public health agencies, such as the local health department, might be particularly important for hospitals in communities with the greatest health needs. For example, expertise provided by the local health department may help these hospitals to conduct more comprehensive CHNAs and develop implementation strategies that address their communities' most pressing needs. Moreover, the findings can inform efforts aimed at strengthening the federal CHNA requirement by encouraging policy makers to consider providing additional resources and support for CHNA activities to hospitals with limited resources and expertise, especially those in communities where the need for such activities is greatest.

Declaration of Conflicting Interests

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