Diversification Into Non-Inpatient Service Lines Among Community Hospitals in Wisconsin

James E. Rohrer

Abstract
Community hospitals may be able to increase revenue by diversifying into non-inpatient service lines. A model predicting this kind of diversification has not been developed. Data from community hospitals in Wisconsin was analyzed to explain diversification into non-inpatient service lines. Principal components analysis was applied to the services offered to identify factors. The derived factor scores were analyzed using multiple linear regression. Two distinct noninpatient identities were identified: a vertically integrated acute hospital and a hospital diversified into community-based services. Regression analysis revealed that horizontal integration was related to vertical integration into non-inpatient service lines. Community hospitals belonging to alliances and systems had lower vertical integration scores.

Keywords
hospitals, marketing, strategy, integration, vertical

Introduction
Community hospitals are unable to change demand for acute inpatient care or to raise prices, at least in the short-run. However, they may be able to provide noninpatient services because direct marketing to consumers can be effective and because local hospitals offer a more convenient service location for people who live nearby. One possible approach to increasing noninpatient care volume is to diversify into noninpatient service lines. Currently unknown is why some community hospitals choose to diversify into noninpatient service lines and others do not.

The purpose of this paper is to explore whether community hospitals can be clustered by the degree to which they vertically integrate or the degree to which they offer community-based services. In addition, the analysis tests whether hospitals that have integrated horizontally with other hospitals show a statistically significant preference for offering either vertically integrated non-inpatient services or community-based services.

The 2 research questions addressed here are as follows.

RQ 1: Horizontal integration is significantly related to vertical integration among community hospitals in Wisconsin. Horizontal integration was measured with 3 dummy variables: multihospital system membership, network membership, and alliance affiliation. Vertical integration was measured by being designated as a Critical Access Hospital, offering urgent care, psychiatric outpatient service, physical rehabilitation outpatient service, or operating a nursing home.

RQ 2: Is horizontal integration significantly related to community-based diversification among community hospitals in Wisconsin? Community-based diversification is measured by offering home health care or alcohol and drug abuse outpatient treatment service.

Methods
The sample for this study is taken from the 2019 American Hospital Association Annual Survey. Hospitals in Wisconsin participated in the survey and supplied data to the Wisconsin Hospital Association (WHA). The data were obtained from the WHA as a digital file. Selected for analysis were general medical and surgical hospitals, including Critical Access Hospitals (CAHs), that had less than or equal to 200 acute beds set up.
and staffed. These selection criteria resulted in a sample of 113 hospitals. The study was exempt from human subjects review because no human subjects were involved.

Horizontal affiliation was measured with 3 dummy variables: multihospital system (yes or no), network (yes or no), and alliance affiliation (yes or no). According to the WHA annual survey manual, a health care system is a corporate body that may own and/or manage health provider facilities as well as non-health-related facilities. An alliance is a formal organization usually owned by shareholder/members that works on behalf of its members in the provision of services and the promotion of ventures. A health care network is a group of hospitals, clinics, physicians or other health care providers, insurers or community agencies that work together to coordinate an deliver a broad spectrum of services to their community.1

Vertical integration into non-inpatient services was measured by being designated as a critical access hospital (yes or no), offering urgent care (yes or no), psychiatric outpatient service (yes or now), physical rehabilitation outpatient service (yes or no), or operating a nursing home (yes or no). Diversification into community-based services was indicating by offering home health care (yes or no) or alcohol and drug abuse outpatient treatment service (yes or no). Total inpatient acute beds was included as a control variable.

Descriptive statistics were examined along with Pearson correlations among all variables. Principle components analysis was used to confirm the distinction between vertical integration services and community-based services. Multiple linear regression models were used to test the effects of horizontal integration on vertical integration and diversification.

**Findings**

The sample of 113 hospitals analyzed in this study was limited to general medical and surgical hospitals with less than or equal to 200 acute inpatient beds. The variables shown in Table 1 were scored as dummy variables. The mean can be interpreted as the percentage of hospitals in the sample that offer the service. Nursing home was offered by less than 10 percent. At the other extreme, outpatient physical rehabilitation services were offered by almost 85 percent of hospitals in the sample. The horizontal integration variables ranged from a mean of 16.8 percent (alliance affiliation) to 77 percent (system affiliation).

Principal component analysis was used to extract factor weights for 2 components (Table 2). The 2 extracted components correspond to vertical integration (component 1) and community-based diversification (component 2). The first component is most strongly correlated with urgent care clinics (.732). Nursing home, critical access hospital and rehabilitation services all weighted greater than .50 on this component. Not related to component 1 were alcohol/drug treatment and home care. The latter services were correlated with the second component (weights were AOS = .762 and home care = .669). Urgent care and rehabilitation had very low weights on component 2 and nursing home was only .232. Critical Access Hospital designation was negatively weighted (-.480) indicating that hospital designated as CAH were less likely to diversify into community-based services.

Factor weights were saved as a regression factor score. Score 1 (vertical integration) was regressed on the horizontal integration strategies (Table 3). The overall effect size for the model can be described as moderately strong (R square = .323). Network affiliation was not significantly related to vertical integration strategies. Both system affiliation and alliance affiliation were negatively related to vertical integration when controlling for total beds (b=-.869, p < .001; b=-.566, p = .018, respectively). Total beds also was negatively related to vertical integration (b=-.005, p = .003).

The regression results for the second component (community-based diversification) were weaker (R square = .162). Only total beds was significant (b = .008, p < .001, Table 4).

**Discussion**

The analysis presented here indicates that community hospitals that are horizontally integrated into alliances and systems have lower non-inpatient vertical integration scores. Horizontal integration is inversely related to vertical integration as measured with these variables in this data set. Horizontal integration is not related to community-based diversification after controlling

---

### Table 1. Descriptive Statistics.

|                      | N  | Minimum | Maximum | Mean  | Std. deviation |
|----------------------|----|---------|---------|-------|----------------|
| **Community Services** |    |         |         |       |                |
| Homecare             | 113| .00     | 1.00    | .1593 | .36758         |
| Alcohol/drug         | 113| .00     | 1.00    | .1681 | .37566         |
| **Vertical Integration** |    |         |         |       |                |
| Psychiatry           | 113| .00     | 1.00    | .2743 | .44817         |
| Rehabilitation       | 113| .00     | 1.00    | .8496 | .35910         |
| Urgent care          | 113| .00     | 1.00    | .6195 | .48768         |
| Critical Access      | 113| .00     | 1.00    | .5133 | .50205         |
| Hospital             |    |         |         |       |                |
| Nursing Home         | 113| .00     | 1.00    | .0973 | .29775         |
| **Horizontal Integration** |    |         |         |       |                |
| System               | 113| .00     | 1.00    | .7699 | .42276         |
| Network              | 113| .00     | 1.00    | .3628 | .48296         |
| Alliance             | 113| .00     | 1.00    | .1681 | .37566         |

---

### Table 2. Structure Matrix. 

|                      | Component 1 | Component 2 |
|----------------------|-------------|-------------|
| Nursing home         | .546        | .232        |
| Critical access hospital | .599       | -.480       |
| Urgent care          | .732        | .036        |
| Rehabilitation       | .567        | .019        |
| Alcohol/drug         | -.019       | .762        |
| Home care            | .194        | .669        |

*Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.*
for bed size. Confirmation of the findings with nationwide data and multiple years is needed before accepting these findings.

The external validity of this to other hospital market areas is unknown. The population density of the state of Wisconsin is lower than in some states but higher than in western states. Many of the hospitals in this sample could be described as rural but none were truly remote. In other states, variations in the level of competition might need to be controlled.

Another limitation of the study is the omission of financial data. The ability of a hospital to offer new services may depend on cash reserves, operating margin or access to capital, all of which were beyond the scope of this study. In addition, the data were only from one year and the cross-sectional nature of the sample precludes a quasi-experimental design. Future research involving quasi-experimental designs should be used to test the findings reported here.

Despite these limitations, the findings of this study should be interesting to health care managers and those who study the behavior of health care managers. Offering a theory as to why horizontally integrated hospitals are less vertically integrated into non-inpatient services would be speculative at this juncture. However, a marketing perspective can be useful.

Strategic marketing differentiates the organization from others to solidify its identity and distinguish it from competitors (p.248). Corollary to this principle is the premise that hospitals will not try to offer every attractive service. Instead, they will seek to either maintain their brand identity or deliberately and strategically revise their brand identity. Diversification into noninpatient service lines, even if potentially profitable, would have to be carefully considered. The traditional core identity of a community hospital is as the provider of acute inpatient services. This identity could be, and often is, broadened to include outpatient services that complement inpatient care. However, doing so involves some risk.

Conclusions

In Wisconsin, community hospitals that are horizontally integrated have lower scores on an index of vertical integration into non-inpatient services. This behavior might be explained by a marketing perspective which suggests that deviation from the core business may not be as attractive as affiliating with other acute care hospitals.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

James E. Rohrer  https://orcid.org/0000-0003-3074-1857

References

1. WHA. Annual Survey of Hospitals. Published online 2019. Wisconsin Hospital Association.

Author Biography

James E Rohrer, PhD, is an Editor in Chief of this journal. He has published extensively in the field of health services research.