Unmet Need and Missed Opportunities for Hospital-Based Substance Abuse Outpatient Services in Rural Wisconsin

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Abstract

Hospital leaders are expected to base decisions regarding services offered on community needs, consumer demands, and financial feasibility. Leaders are likely to pursue opportunities to provide potential services in convenient places at competitive pricing. In this study, the positive impact of providing hospital-based outpatient alcohol and drug treatment on total outpatient visits is demonstrated among rural hospitals in Wisconsin. However, only 16% of targeted rural hospitals offered outpatient and drug treatment services. The provision of services seemed unrelated to community need, potential demand, or consumer preference.

Introduction

Rural hospitals have struggled to survive for decades (Barclay & Kornelsen, 2016). Managers cannot arbitrarily raise prices to cover budget shortfalls. Expansion of bed capacity in order to increase volume is not feasible in the short run because access to capital is limited. Also, demand for inpatient care is largely constant because it is based on the number of people residing in the service area. Some local potential customers choose to bypass rural hospitals and receive services in nearby urban hospitals (Malone & Holmes, 2020).

Managers turn from expanding inpatient care to managing throughput efficiency, quality management, personnel management, and marketing (Thomas, 2005). Selection of outpatient services (the service mix) is a marketing decision that could be based on information about community need, potential demand, or consumer preference. However, we do not know if service mix is actually based on this kind of information.

Outpatient treatment for substance abuse is an example of a service that could be offered in a rural hospital. Indeed, this service is part of the service mix of some rural hospitals. Consumer surveys conducted by Wisconsin state government reveal that treated clients are dissatisfied with the convenience of treatment programs. When asked “what would have made services better for you,” the most common response was “more convenient times for appointments or groups” (33% Figure 58 in the report). The second most common response, given by 26%, was “more convenient locations or transportation assistance” (Wisconsin Department of Health Services, 2017). This information suggested that consumers might find locally offered substance abuse treatment to be more attractive than services that require travel.

Research Questions

Does offering outpatient substance abuse services affect the volume of outpatient services in rural hospitals in Wisconsin?

Is offering outpatient substance abuse services associated with community need, consumer demand, or financial feasibility?

Economic Model

According to an economic production model, the hospital converts inputs to outputs. The model assumes capital is fixed, prices are fixed and all units produced can be sold. A 4-Ps marketing model refines this perspective (Thomas 2005,p. 78, 90-92) by proposing that services can be sold if the Price is acceptable, the Place of service is convenient, the Product is

desirable or necessary and the customer can be informed about the availability of the service (Promotion). In addition, the quantity of forecasted demand should be sufficient to justify the startup costs and the potential market share should consist of sufficient volume.

Research Methods

The two research questions can be addressed by testing the theoretical model as follows:

1. Outpatient visits = f{inputs, other outputs, outpatient services offered}
   where inputs are beds, nonpayroll expenses and full-time employee equivalents (FTE). Other outputs could divert some of the inputs away from outpatient services. Other outputs are measured by admissions to inpatient care, number of births and nursing home care. Six outpatient services are included in the model.

2. Substance abuse service is offered = f{need, demand, quality of services currently provided}
   where need is measured by total population over age 12 and percent of the population living in poverty. Demand is measured by the number of substance abuse visits per capita. Consumer satisfaction is measured by the completion rate.

Rurality can be defined in a variety of ways. For this analysis, a county-based system was appropriate because data about needs and services provided are reported by county. Counties were defined as metro or rural by the Office of Management and Budget (see map at ers.usda.gov). Information about hospitals located in those counties in Wisconsin in 2016 was extracted from the American Hospital Association Guide to the Healthcare Field, 2017. Complete data was available for 55 hospitals. All except three hospitals were not-for-profit. One was for-profit and two were government owned. The paper was exempt from human subjects review because no human subjects were involved.

Input variables in this study were staffed beds (includes nursing home beds), nonpayroll expenses, and FTEs. Other outputs were inpatient admissions, number of births, and nursing home (yes or no). The total of outpatient visits was the dependent variable in the first model. This variable was transformed by taking the natural log plus .01 due to its skewed distribution.

The outpatient services offered was measured by a series of six dummy variables these were:

Service 5. Alcoholism-drug abuse and dependency outpatient
Service 62. Home health services
Service 69. Meals on Wheels
Service 93. Physical rehabilitation outpatient
Service 97. Primary care department
Service 104. Psychiatry outpatient.

County-level data about need, demand, and quality were taken from a state report (Wisconsin Department of Health Services, 2017). Population in the county age 12 and over is an indicator of total potential need (from Table 37 in the report). Also from Table 37 are county-authorized persons served and Medicaid-reimbursed persons served in 2015. These were summed and divided by per thousand adult population to measure demand for substance abuse treatment services. Percent of population living in poverty is a need indicator (Table 44). Percent completing treatment of county-authorized services from Table 51 in the report.

The first model was estimated using ordinary least squares multiple regression analysis using stepwise selection and removal of variables. The model for equation 2 was estimated using multiple logistic regression analysis.

Findings

Descriptive statistics are shown in Table 1. Among the 55 hospitals for which complete data were available, wide variation can be seen in bed size, FTEE, nonpayroll expenses, and outpatient visits. The percentages of hospitals providing the six services ranged from 16 to 93. About one-fifth had nursing homes. The mean number of births was 194, but many hospitals had no obstetrics service. Almost all hospitals offered service 93: outpatient physical rehabilitation. Only 16 percent offered outpatient alcohol and drug treatment.

Table 1.

Descriptive Statistics for Rural Hospitals in Wisconsin, 2016 (N=55)

	N	Minimum	Maximum	Mean	Std. Deviation
Beds	55	5	275	46.47	45.261
FTEs	55	69	1204	312.00	213.077
NonPayExp	55	4090	205514	36421.47	39630.544
OutpatientVisits	55	9784	413606	73644.75	78601.266
lnOpv	55	9.19	12.93	10.7806	.91264
nh	55	0	1	.22	.41682
Births	55	0	1009	194.09	198.275
svc5	55	0	1	.16	.373
svc62	55	0	1	.24	.429
svc69	55	0	1	.27	.449
svc93	55	0	1	.93	.262
svc97	55	0	1	.42	.498
svc104	55	0	1	.24	.429
Valid N (listwise)	55				

The averages for county variables (Table 2) are based on hospitals as the units of analysis. Some counties were home to more than one hospital. Rural counties with no hospitals were excluded from the analysis. The table reveals that the mean population of persons ages 12 and over was about 35,000 in these rural counties. Persons served per capita averaged 8.13. The mean poverty rate was 13.13. On average, about 55 percent of clients completed their programs. The completion rate was not available for two counties, so those were dropped from the regression analysis.

Table 2.

Descriptive Statistics for Need, Demand and Quality

	N	Minimum	Maximum	Mean	Std. Deviation
pop12up2010	55	6366.00	86512.00	34935.47	20350.35
percapitaservice	55	2.62	27.07	8.13	4.75
pctcompleting	53	28.00	90.40	54.94	15.90
pctpoverty	55	8.70	18.00	13.13	2.23
Valid N (listwise)	53				

Stepwise regression analysis of the log of outpatient visits explained 45.9 percent the variance with only two variables: FTEE and service 5. Hospitals offering service 5 had .714 more of the logged outpatient visits. The number of FTEE is a stronger predictor of outpatient visits than service 5 (betas were .535 and .292, respectively). However, service 5 is strongly significant (p=0.008). This model demonstrates that offering substance abuse outpatient treatment is associated with significantly higher outpatient visits in rural hospitals in Wisconsin.

Table 3.

Coefficients from Stepwise Linear Regression Analysis (Adjusted r-sqrs=.393 and .459)[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	9.931	.171		58.057	.000
	FTEE	.003	.000	.636	5.999	.000
2	(Constant)	9.949	.162		61.573	.000
	FTEE	.002	.000	.535	5.013	.000
	svc5	.714	.261	.292	2.738	.008

a. Dependent Variable: lnOpv

Table 4 tests the theory that hospitals offering service 5 are meeting community needs, potential demand and client preferences. If this true, then hospital-based substance abuse treatment is more likely to be located in counties where both need and demand are higher and clients are more likely to complete treatment. However, none of the community based independent variables are significantly related to the availability of service 5.

Table 4.

Results of Multiple Logistic Regression Analysis of Service 5 (N=53)

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	pop12up2010	.000	.000	1.397	1	.237	1.000
	percapitaservice	.037	.085	.184	1	.668	1.037
	pctpoverty	-.003	.190	.000	1	.989	.997
	pctcompleting	.042	.025	2.738	1	.098	1.043
	Constant	-5.147	3.270	2.476	1	.116	.006

The level of unmet need in the county is approximated by persons treated per capita. Where few people were treated per capita, the level of unmet need is expected to be highest. In Table 5, the first quartile of the per capita treatment variable contains four of the nine hospital-based substance abuse treatment programs. This represents 30.8 percent of the 13 hospitals located in counties at that level of need. The percent of hospitals located in counties with the lowest level of unmet need (quartile 4), was almost as high (25 percent). The level of unmet need as measured by per capita treatment rates is not related to placement of hospital-based substance abuse treatment programs.

Table 5.

Crosstabulation of Unmet Need/Potential Demand by Availability of Service 5 in Rural Hospitals in Wisconsin[a]

			svc5		
			0	1	Total
unmetneed	1.00	Count	9	4	13
		% within unmetneed	69.2%	30.8%	100.0%
	2.00	Count	13	1	14
		% within unmetneed	92.9%	7.1%	100.0%
	3.00	Count	11	1	12
		% within unmetneed	91.7%	8.3%	100.0%
	4.00	Count	9	3	12
		% within unmetneed	75.0%	25.0%	100.0%
Total		Count	42	9	51
		% within unmetneed	82.4%	17.6%	100.0%

[a] Data are in quartiles. Quartile 1 is the highest level of unmet need/potential demand.

Finally, the level of competition for outpatient substance abuse treatment was examined in those counties were hospital-based treatment programs were located. Six out of nine of the hospitals providing svc 5 were in counties containing at least one other agency providing outpatient substance services (agency code 75.13). The state directory contains a total of 309 agencies that were coded as 75.13 (outpatient substance abuse providers)in its directory of providers (Saarinen-barr & Saarinen-barr, 2020). There is a total of 519 substance abuse

service providers. Eight of the nine hospitals providing service 5 are all located in counties with at least one other provider of some kind of substance abuse treatment. Offering service 5 does not appear to be predicated on addressing unmet needs because the services were offered in counties where services were available from another agency.

Discussion

This analysis suggests that rural hospital leaders have not consistently based their decisions about offering outpatient substance abuse treatment on community need (as indicated by an absence of providers), potential demand, or consumer preferences. Faced with the opportunity to provide a desired service in a convenient location at the market price, most have chosen not to do so.

Not all organizations have adopted a marketing-mindset and hospitals have been slow to do so because of predominantly not-for-profit nature of the industry (Thomas, 2005). Rural hospitals may not be driven to pursue economic opportunities due to low levels of competition and reliance on adequate resources from local sources (Chien et al., 1995). On the other hand, declining to enter the outpatient substance abuse treatment market might be explained by barriers not measured in this study. Managers will be aware of those barriers and whether they are present in their local market. For example, after consulting with peers, they may have learned that start-up costs are high, profitability is low, or clinical staff are not available. They may have learned that local county government does not want to fund more outpatient substance abuse treatment. State government licensing and regulatory requirements may be difficult to satisfy. Or they may have discovered that local providers or providers in adjacent counties might be robust and challenging competitors. Finally, rural hospitals may not be driven to pursue economic opportunities due to low levels of competition and reliance on adequate resources from local sources (Chien et al., 1995).

If strategic decisions about service mix are not based on market analysis, community need, potential demand or client preferences, then other decision-making models might be in play. Managers are motivated to limit the amount of time and effort they must invest in strategic planning. The default option in many situations is to assume the core business should be maintained. The decision rules might be “Stick to the knitting” and “if it ain’t broke don’t fix it.” Other managers, however, have opted to open substance abuse treatment programs. The decision to innovate may not have been based on market research. Most of the hospital-based substance abuse treatment programs are not located in vacant market niches. Instead, hospital programs are operating in the same counties where other substance treatment programs are operating. The decision model might be based on following successful examples. The rule might be this: ‘keep up with the Joneses.”

This analysis suffers from several limitations. The data are from only one state so findings may not hold true in other states. Some data were missing, causing a few hospitals to drop from the analysis. The analysis only captures county funded and Medicaid funded services so the findings are most relevant for hospitals that might consider launching programs that will rely on county funding along with Medicaid reimbursement. Some commercial insurance information is provided in the state report, but that information for many counties is missing because private pay and self-insured company benefits were not reported. Demographic data may have limited value for hospital strategic planning due to imprecision about needs and potential demand (Borders et al., 2000). Consequently, indicators of need and potential demand might be inaccurate. However, better information is not likely to be available to hospital managers.

Despite these limitations, this study supports some conclusions. First, hospital-based substance abuse treatment programs might constitute a business opportunity for rural hospitals in Wisconsin. Second, strategic decisions about service mix appear not to be based on decision rules suggested by economic theory or marketing professors. Instead of relying on market

research or even a back-of-the-envelope analysis, decisions might be based on instinct, inertia and local success stories. Not to be discounted is the importance of what might be described as the culture of hospitals. Hospitals have traditionally provided resources for medical practice. Medical services are the core business and extending the activities of the hospital to other services such as outpatient substance abuse treatment is counter-cultural.

R hospital leaders may not be motivated to plan the service line mix by analyzing available data. Indeed, there may be a myriad of factors that contribute to how service line mix is determined by the leadership of a given rural hospital. The findings of the above-described research into substance abuse programs in hospitals in rural Wisconsin indicate that rational-empirical decision-making based on available data does not seem to adequately describe how service line mix is determined. Therein lies significant opportunity for further research.

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