Competition and Services Offered Among General Hospitals in the Deep South

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Abstract

In the United States, the cost of health care is much higher than it is anywhere else. High expenditures for hospital services could reduce the resources available for primary care and other services that could do more for population health. The purpose of this study was to explore the competition among general medical and surgical hospitals in the deep southern states of Mississippi, Alabama, Georgia, South Carolina, and Louisiana to determine if increasing the level of competition was associated with more services being offered. The design of the study was cross-sectional, employing multiple regression guided by the Medical Arms Race (MAR) theory. The dependent variable was the total number of services offered, and the primary independent variable was market concentration, as measured by the Herfindahl-Hirschman Index. The covariates were age, poverty level, and urban/rural location. The number of services in general medical and surgical hospitals in Mississippi, Alabama, Georgia, South Carolina, and Louisiana were measured to determine whether increasing levels of competition resulted in more services being offered. The findings of this study strongly support the MAR theory with higher market concentration being associated with fewer services being offered; this indicates that more competition increases the number of services offered. Health Care Management Research Digest, Volume 1 (2020-2021). Contact: dr.vanessastone@outlook.com.

Introduction

Some studies have explored the relationship between competition and hospital performance (Lyszczarz & Blazej, 2014; Roj & Justyna, 2016) as well as between competition and health care costs (Dranove, Shanley, & Simon, 1992). These studies showed how competition is capable of affecting the health care market to improve quality as well as efficiency. In this study, I explored whether hospital competition had an impact on the number of hospital services that were offered.

According to Laugesen and Glied (2011), the increase in health care prices in the United States is the reason for higher health spending than in other countries. Additionally, higher fees serve as a main driver of higher spending in the United States, especially in orthopedics (Laugesen & Glied, 2011). This is significant because higher expenditures for hospital services could potentially reduce the resources available for primary care and other health care services offered to the population, which would result in competition being the force for the increase in hospital costs. Focusing on general medical and surgical hospitals in the states of Mississippi, Alabama, Georgia, South Carolina, and Louisiana, I tested the association between number of hospital services

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offered and the level of competition between hospitals. The Medical Arms Race (MAR) theory suggests that hospitals compete by providing costly medical services that may be duplicative (Dranove et al., 1992).

Theories of the hospital industry view hospitals as competing for patients (Rivers & Glover, 2008). Hospitals within the United States are challenged to find ways to compete and remain successful in a heavily competitive industry. Competitive strategies are commonly used by hospitals to generate quality health care to remain viable in increasingly competitive environments (Rivers & Glover, 2008). According to Farhad et al., (2014), being aware of hospital performance is a major concern for policy makers. Laugesen and Giled (2011) explained that higher health care prices in the United States are a key reason that the nation's health spending is much higher than that of other countries. Berk and Moneit (2001) supported this finding, reporting that there is a social problem as a result of high expenditures for hospital services that reduces the resources available for primary care and other services that do more for population health.

The purpose of this study was to measure the level of competition among general medical and surgical hospitals in Mississippi, Alabama, Georgia, South Carolina, and Louisiana to determine if increasing the levels of competition were associated with more services being offered. The MAR theory suggests that hospitals compete for physicians and that quality is over- or underprovided in competitive markets (Dranove et al., 1992). Researchers, using more recent data, have generally found that competition among hospitals leads to reductions in excess capacity, costs, and prices (Gruber, 1994; Melnick et al., 1992; White, 1993; Wooley, 1989; Zwanziger & Melnick 1988). According to Spence (1975), factors such as the marginal and average value of quality perceived by consumers determine whether quality is over- or underprovided. Some services are needed and not obtained, and others are utilized but not clearly indicated, or are indicated only after other protocols are followed (Kale et al., 2013; Kressin & Groeneveld, 2015; Lyu et al., 2017). Dranove et al. (1992) explained that hospitals potentially raise their quality to attract patients through their primary care physicians, while physicians are quality sensitive with their services being a substitute for their time. In the current study, I measured competition at the county level, basing measurements on the number of hospitals in the county and their market shares.

Theoretical Framework

The MAR theory was used as the theoretical framework for this study. According to Dranove et al. (1992), the MAR theory suggested that quality is overproduced in competitive markets. The Herfindahl–Hirschman Index (HHI) was used in this study to measure market concentration between hospitals. Market concentration is the inverse of competition, whereas a negative result of correlation in this study would mean increased market concentration (i.e., lower competition) is associated with more services being offered in general medical and surgical hospitals. In the field of health economics, supplier-induced demand can be used as the mechanism by which MAR leads to higher utilization of services (Luft & Arno, 1986). According to Ginsburg and Koretz (1983), Roemer's Law is the notion that an increase in the number of hospital beds per capita increases hospital utilization rates. Roemer's Law may be expressed as "a built bed is a filled bed" (Delamater, Messina & et. al., 2013). Although all beds may not be filled these days, supply-induced demand is still operating. Miller (1980) explained that the federal

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government, which finances most health care costs, decreed that regulation shall govern the supply of institutional health services, whereas a certificate of need (CON) is required from a state agency in order to make capital expenditures. The U.S. Department of Justice (2007) explained that CON laws were adopted due to excessive capital investments driving up the costs of health care. Since patients were not price sensitive, the MAR theory was adopted by providers to unnecessarily expand their services to offer higher-quality services (U.S. Department of Justice, 2007). For this reason, the CON laws appeared to have failed concerning their intended purpose of containing health care costs. Positive social change may come from the results of this study, which could potentially be used by policy makers to improve the performance of the health care system.

Literature Review

The findings from previous research studies pertaining to changes in the health care market indicated that there is a clear association with the level of hospital competition (Roj, 2016). Hospitals are among other health care providers that are a central part of every health care system and are responsible for a great share of health care expenditure (Roj, 2016). Hospitals are considered to be the largest consumers of scarce health care resources (Scheunemann & White, 2011); therefore, it is important for them to be as efficient and effective as possible with the resources available.

According to the MAR theory, hospitals compete by offering too many high-tech medical services (Dranove et al., 1992). Frequent use of advanced technology in hospitals is associated with significant costs even while providing benefits (Zelman, McCue, Millikan, & Glick, 2004). While hospitals could compete for physicians by offering more trained staff and better equipment, they are more likely to compete for their patients by offering more services (Rivers & Glover, 2008). For health care marketing and policy purposes, an analysis of hospital competition was highly important. According to Dranove et al. (1992), increased competition does in fact lead to a small increase in the supply of specialized services.

According to Roj (2016), general hospitals are characterized by multiprofile activity, where patients usually stay no longer than 30. Roj studied the measurement of competition of general hospitals in Poland with the use of the HHI to understand how the market of general hospitals had been marketed as a proxy of competition. The researcher focused on 16 general hospitals in Poland during the years 2005 and 2013 while measuring the levels of market share concentration. The results from the study supported that change in the health care market affects the level of concentration as well as competition. Dranove and White (1994) explained that hospital rates are lower when there are fewer hospitals in an area.

Ideally, health care utilization should correlate with need for services; however, some services are needed and not necessarily obtained, while others are utilized without being clearly indicated or are indicated but only after other protocols are followed (Figueroa et al., 2017; Kale et al., 2013; Kressin & Groeneveld, 2015; Lyu et al., 2017). Higher health care costs for services within the United States is one of the main reasons for the increase in the nation's health spending being much higher than that of other countries (Laugesen & Giled, 2011). Competition in health care is perceived as a mechanism that is used to increase value for patients (Rivers & Glover, 2008). Roj (2016) explained that competition eliminates inefficiencies that would yield the high costs

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of producing and delivering services from the high costs of health services and delivery being transferred to patients or insurers. While competition does provide a mechanism to reduce health care costs, it also ensures better services, satisfying patient needs (Rivers & Glover, 2008). In this study, the term *cost* referred to the health care expenditures allocated to a patient's health care encounter.

Over time, waste in health care has been recognized as a cause of patient harm and excess costs. In 2010, the Institute of Medicine first called attention to this problem, suggesting that "unnecessary services" are the largest contributors to waste in U.S. health care accounting for $210 billion of $750 billion in excess spending each year (McGinnis, Stuckhardt, & Smith, 2013). Dranove et al. (1992) discussed the MAR theory as a costly duplication of specialized services and explained hospital competition as being wasteful and resulting in higher costs rather than being beneficial. The authors tested the MAR theory against the economic proposition emphasizing the importance of the specification of the extent of the hospital market rather than overestimating the importance of competition. The authors found that increased competition did lead to a small increase in the supply of specialized services, making it an important determinant of resource supply (Dranove et al., 1992).

The HHI was developed by Hirschman and Herfindahl to measure the number or hospitals in a market and first used as a statistical measure to determine the concentration level of the general hospital sector in Poland. This index is the sum of the squared market share of each hospital or hospital system within the market (multiplied by 10, 000; Roj, 2016). A market share is considered highly concentrated if they have an HHI between 1,500 and 2,500, unconcentrated with a range between 100 and 1,500, and highly competitive if the HHI is below 100 (Cutler, 2013). Roj (2016) explained that the lower the number of hospitals and concentration of market share in fewer hospitals, the higher the HHI, while Lyszczarz (2014) suggested that higher concentration in the hospital market correlates with an increase in the cost of services.

Also associated with hospital demand are the location of the hospital (urban or rural), age distribution of the population and the poverty level in the local market. In 1999, people over the age of 65 years old experienced nearly 3 times as many hospital days per 1,000 than the general population (Bernstein, Hing, & Moss, 2003). Poverty level also has an effect on health care utilization.

Methods

According to the AHA 2017 Guide, the state of Mississippi had 93 general medical and surgical hospitals, Alabama had 89, Georgia had 133, Louisiana had 103, and South Carolina had 61, totaling 481 general medical and surgical hospitals. Complete information was only provided by 295 of them.

The dependent variable was the total number of services offered by a general medical and surgical hospital. The primary independent variable was the Herfindahl Index of market competition (the sum of the squared market shares) computed using the county as the market area. The Index was recoded into three categories due to its skewed distribution. The covariates were age, sex, urban/rural location, and poverty level. A multiple linear regression was conducted to address the research question.

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Findings

Table1 reports descriptive statistics for the continuous variables used (i.e., number of services, percentage of population over 65 years old, poverty rate, HHI, urban and rural location). The rural variable has been coded as 1 if the hospital is rural and 0 if the hospital is in an urban area. The table shows the mean number of services as 43.3%, while the means for other variables were as follows: percentage of population over 65 years old (17.2%), poverty rate (19.8%), HHI (.818), and rural location (.363).

Table 1

Descriptive Statistics Summary of Number of Services, Percent over 65, Poverty Rate, HHI and Rural

	N	Minimum	Maximum	Mean	Std. Deviation
Number of Services	295	0	127	43.3	23.3
PctOver65	295	6.3%	52.6%	17.2%	4.2%
Poverty Rate	295	5.0%	37.6%	19.8%	5.8%
HHI	295	.006	1.0	.818	.272
Rural	295	0	1	.363	.482
Valid N (listwise)	295				

Note: The data output for descriptive statistical analysis utilizing a sample of 295 general medical and surgical hospitals and all variables.

Table 2 shows how many general medical and surgical hospitals there were in each state. Mississippi and Alabama contributed the most cases to the sample (25.4% and 24.1%, respectively). Louisiana and South Carolina contributed the least number of hospitals (13.9% and 14.6%, respectively). Urban hospitals comprised 63.7% of the sample and rural hospitals were 36.3% (table not shown). Low HHI hospitals were 23.7% of the sample. The shares for medium HHI and high HHI were 13.9% high HHI were 62.4%, respectively (table not shown).

Table 2

Percentages by State

		Frequency	Percent
Valid	Alabama	71	24.1%
	Georgia	65	22.0%
	Louisiana	41	13.9%
	Mississippi	75	25.4%
	South Carolina	43	14.6%
	Total	295	100.0%

Results of regression analysis are shown in Table 3. The adjusted r-square revealed an explained variation of 11.7 percent for the model overall. The unstandardized B for HHIMedium is -8.56 and HHIHigh: -13.53. As indicated by the standardized regression coefficients, HHIHigh was the strongest predictor of the number of services. In comparison to HHILow hospitals, the HHIHigh hospitals had 13.53 fewer services ($p<0.001$).

Alabama had -9.42 fewer services than Louisiana (the reference category). South Carolina had 9.85 more services than Louisiana. Mississippi had -12.37 fewer services than Louisiana. Georgia, rural and poverty rate were not significant.

Table 3

Results of Regression Analysis with HHI Dummy Variables

					95% CI	
Model	B	Std. Error	Beta	Sig.	Low	Upper
(Constant)	78.34	7.74		.000	63.10	93.57
Rural	.611	2.69	.013	.821	-4.69	5.91
Urban	1.0					
PctOver65	-.959	.313	-.173	.002	-1.57	-.343
Poverty Rate	-.282	.234	-.071	.230	-.743	.179
Alabama	-9.42	4.34	-.173	.031	-17.98	-.878
SouthCarolina	9.85	4.83	.149	.042	.345	19.37
Georgia	1.80	4.53	.032	.691	-7.12	10.73
Mississippi	-12.37	4.20	-.231	.004	-20.65	-4.09
Louisiana	1.0					
HHIMedium	-8.56	4.27	-.127	.046	-16.98	-.146
HHIHigh	-13.53	3.24	-.281	.000	-19.90	-7.15
HHILow	1.0					

Discussion and Conclusions

The purpose of this study was to explore the competition among general medical and surgical hospitals in Mississippi, Alabama, Georgia, South Carolina, and Louisiana to determine if increasing the levels of competition was associated with more services being offered. The study involved further examination and application of the MAR theory, which posits that hospitals compete for physicians and that quality is over- or underprovided in competitive markets (Dranove, Shanley & Simon,1992). In the study reported here, hospital competition was measured inversely with the use of the HHI to determine market concentration.

The findings revealed that the statistically significant variables were HHI, percentage of population over the age of 65 years old, Alabama, South Carolina, and

Mississippi. Of the independent variables, high HHI (-13.53) is the strongest predictor of the number of services showing the biggest effect. HHI is strongly and negatively related to the number of services being offered, which indicates that competition is strongly and positively related to services offered. In comparison to low HHI hospitals, the high HHI hospitals have 13.53 fewer services, which is the most powerful predictor.

The main limitation of this study was the omission of some hospitals within certain states that did not provide the necessary statistical information for analysis. Also, Goldstein et al. (2002) explained that hospital size may be associated to some of the variables studied and may be a useful predictor of technology investment. Size should be controlled in future studies.

The health care industry faces many challenging issues, and for this reason, the impact of increased competition on the quality of health care and system costs is still unclear (Rivers et al., 2008). Dranove et al. (1992) defined the MAR theory as a costly duplication of specialized services, explaining hospital competition as being wasteful and resulting in higher costs rather than being beneficial. The authors tested the MAR theory against an economic proposition emphasizing the importance of the specification of the extent of the hospital market rather than overestimating the importance of competition. The authors found that increased competition did lead to a small increase in the supply of specialized services, making it an important determinant of resource supply (Dranove et al., 1992). The results of the current study showed strong support for the MAR theory. Dranove et al. explained that there was a pattern of coefficients that suggested increased competition led to a small increase in the supply of specialized services. In the current study, the results suggested that there is association between competition and the number of services offered. Further research could encompass more states with complete hospital statistical data providing more specific results pertaining to hospital competition between general medical and surgical hospitals.

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