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SUITE 600, 1233 20TH STREET, N.W.
WASHINGTON, D.C. 20036
(202) 223-4700
TELECOPIER: 202-296-7138

May 1, 1990

Attn: Annette
Graduate School of Health Administration
University of Chicago
1101 East 58th Street
Chicago, IL 60637

Dear Annette:

As per our discussion of this morning, I would like to obtain a copy of Dranove, Shanley & Simon's "Is Health Care Competition Wasteful? No!". I believe you mentioned that there was both a long version and short, less economic version. I am interested in the longer version of the study.

I have enclosed a check for three dollars made out to the University of Chicago. To expedite our receipt of this paper, please send it via Federal Express to the attention of John Preston at the address listed above. Our Federal Express number is 1004-8454-4. If you have any questions about this request, please do not hestitate to call me.

Thank you very much for your assistance.

Sincerely,

Nancy A Schwartz

Nancy A. Schwartz
Research Assistant

The University of Chicago
Graduate School of Business
Center for Health Administration Studies (CHAS)
1101 East 58th Street, Walker 111
Chicago, Illinois 60637
(312) 702-7104

WORKSHOP IN HEALTH ADMINISTRATION STUDIES

AUTUMN, 1989

DAVID DRANOVE, Ph. D. and MARK SHANLEY, Ph. D.
Associate and Assistant Professors
The Graduate School of Business
The University of Chicago

"Hospital Market Definitions"

for

Thursday, October 19, 1989

Rosenwald 405

3:30 - 5:00 p.m.

A Note on the Relational Aspects of Hospital Market Definitions

David Dranove

and

Mark Shanley

University of Chicago

Graduate School of Business*

Abstract

Several recent analyses of the structure, conduct and performance of local hospital markets base their market definitions on geographic constructs that fail to consider the implications of a market's location relative to other hospital markets. In this note we show the importance of relational aspects of hospital markets. Use of any a priori measure of hospital markets that does not consider these aspects should be reconsidered.

* 1101 E. 58th Street, Chicago, IL 60637 The authors received outstanding technical support from Lawrence Wu.

A Note on the Relational Aspects of Hospital Market Definitions

Several recent analyses of the structure, conduct and performance of local hospital markets have failed to consider the implications of a market's location relative to other hospital markets. This is perhaps best exemplified by several recent papers written by researchers with current or recent connections to the University of California at San Francisco (henceforth we will refer to them collectively as "UCSF").[1] UCSF proposes that a hospital's geographic market may be defined by a fifteen mile radius circle around that hospital. Others (cf. Noether, 1988) have used the Standard Metropolitan Statistical Area (SMSA). In this note we show the importance of relational aspects of hospital markets. We argue that the use of any a priori measure of hospital markets that does not consider these aspects, including the fifteen mile measure, should be reconsidered.

UCSF offers two defenses for their use of a fifteen mile criterion for hospital market definition: (1) No doctor would normally travel more than fifteen miles in order to treat patients; and (2) This measure is sometimes empirically comparable to other geographic measures (Garnick, et. al., 1987). We find neither defense of the fifteen mile measure persuasive. Consider the argument that no doctor will travel over fifteen miles.[2] Even if we accept

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[1] Their papers include Robinson, 1988; Robinson, et. al., 1988; Garnick, et. al. 1987; Robinson, 1986; Luft, et. al., 1986; and Robinson and Luft, 1985. Other papers that look at hospital market definitions include Dranove, et. al., 1989; Morrisey, et. al., 1989; Werden, forthcoming; and Zwanziger, forthcoming.

[2] One paper (Robinson, 1988) defends the fifteen mile measure by referencing an average travel time for nurses of twenty minutes. The translation from minutes to miles is unclear to us (it takes one of the authors twenty minutes to travel seven miles). Nor do we understand the linkage between the travel times of professional staff and competition between hospitals.

this (and accept their implicit assumption that doctors' practices are located inside or next to their hospitals), the appropriate issue for market definition is what will patients do. If patients are completely beholden to doctors, and if doctors do not travel, then the UCSF argument is defensible. However, if doctors make referrals, or if patients switch from immobile doctors when they feel that travel is necessary, then the UCSF argument needs to be modified.

Table 1 shows that substantial numbers of patients obtain care outside of their own communities, traveling well in excess of fifteen miles in doing so. For expository purposes, we use the "urbanized area" as the working definition of the local market.[3] The first column in the Table identifies the urbanized areas of California. The second column reports the distance from the downtown of each urbanized area to the downtown of the nearest urbanized area. If an individual receives care in some urbanized area other than his own, he must travel at least this distance.[4] The minimum distance between urbanized areas is fifteen miles, and over 78% of the distances exceed 25 miles. We conclude that travel between urbanized areas generally exceeds fifteen miles. If we accept UCSF's definition, the 28 urbanized areas of California would appear to be distinct hospital markets.

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[3] An urbanized area is defined as a central city and all contiguous zip codes with population densities exceeding 1000 per square mile, such that the total population exceeds 50,000. Urbanized areas are the same size or smaller than SMSAs. The source for the distance measures is the Rand McNally Road Atlas, 1989 edition.

[4] In a few cases around the Bay Area, urbanized areas are contiguous or near contiguous, so that distances between these downtowns may overstate travel for some. On the other hand, individuals residing in the Riverside, San Francisco, San Jose, and Los Angeles urbanized areas can easily travel distances exceeding fifteen miles without leaving the urbanized area.

The geographic distinctiveness of urbanized areas does not completely inhibit travel between them, and leads us to question whether they are distinct hospital markets. Column three of Table 1 reports, for each urbanized area, the percentage of hospitalized residents admitted to a hospital in some other urbanized area.[5] We call this the percentage "outflows."[6] We calculated the outflow percentages from a 10% random sample of 1985 utilization data provided by the California Office of Statewide Health Planning. This is the same data used by UCSF, and is described elsewhere (cf. Garnick, et. al., 1987).

As Table 1 shows, outflow percentages vary considerably, ranging from 1.28% to 59.12%. In 15 of the 28 urbanized areas, outflows exceed 10%. The 10% figure is particularly noteworthy, because this is the standard figure used by the Department of Justice in defining markets for anti-trust analysis. Not surprisingly, multiple regression (not reported) shows that outflow percentages decline as local population and distance to other urbanized areas increase.

As one might expect, flows out of smaller cities are even more substantial than flows out of urbanized areas. We calculated outflows for fifteen cities in California with the following characteristics: (1) Each city has between 10,000 and 50,000 residents; (2) Each city has at least one community hospital; and (3) Each city is at least fifteen miles from any other city over

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[5] We restrict our analysis to admissions to community hospitals.

[6] The reported figure may over or understate actual outflows. On the one hand, some outflows are not tabulated because they are to unurbanized areas or out of state: On the other hand, reported residence zip codes may be incorrect or inappropriate (e.g., out-of-town college students).

10,000 population with a community hospital.[7] According to the UCSF market definition, these should all be clearly defined markets. The magnitude of mean outflow percentages for these smaller cities, reported on the last line of Table 1, shows that they are not clearly defined markets and that a simple a priori market definition criterion is bound to mislead.

The high percentage of outflows suggests that in many areas, local "capacity" (i.e., as reflected in the personnel, equipment, supplies, etc., necessary to provide service) is insufficient to meet local demand. This is highlighted in column four of Table 1, which gives the ratio of the total number of local residents receiving treatment in any urbanized area to the total number of individuals residing in any urbanized area in the state, who were treated in local hospitals. As, this ratio becomes larger than one, local "capacity" does not meet local demand; i.e., there is "excess local demand" that is being met by distant capacity. Most areas, especially the smaller urbanized areas, have "excess local demand".

In summary, Table 1 shows that, for many areas, large numbers of local patients travel in excess of fifteen miles to receive hospital care, thus reducing the demand for local hospital services. The importance of this finding is that "fringe" capacity (i.e., capacity at distant hospitals) can not be excluded from an analysis of local market structure and performance, especially since the importance of fringe capacity may vary systematically with other market characteristics, such as size and distance. The importance of size and distance for understanding market structure is further evidenced by regression results that we present below.

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[7] For this calculation we included all individuals who were (a) residents of one of these cities or an urbanized area, and (b) hospitalized at a community hospital in one of these cities or an urbanized area.

Consider next the argument that the fifteen mile measure is acceptable because it generates empirical results that are frequently consistent with alternative measures. This is unsatisfying, in part because it flips around null and alternative hypotheses. It is also not clear to us that the bases for the alternative measures (these include the county, and an ad hoc definition based on flows) have been adequately established. We find the UCSF conclusion, that "choosing an appropriate definition of hospital market area depends on the purpose at hand," to also be problematic. We certainly recognize that reasonable people can disagree as to how markets should be defined, but whatever definition one employs should be consistently employed and motivated by a theory that is consistent with casual empirical evidence.

The above concerns about limiting market definitions to fifteen mile radius circles would be merely nuances if the distance to other markets had no discernable influence on local market structure; e.g., the Herfindahl index. An analysis of local market structure based on simple supply and demand concepts shows, however, that distance matters. Numerous theories come to mind as to why this might be so. For example, the availability of fringe substitute supply may affect the number of hospitals in a market, the number of full-service hospitals, the distribution of services across hospitals, etc. It is easy to extend these theoretical considerations to issues of market conduct and performance. As we explain below, disentangling these theories is not an easy task, and it is not our purpose to do so here.

Table 2 presents the results of a regression in which the dependent variable is the Herfindahl index in each market. The predictors are (1) log of local population (POP), which serves as a simple proxy for local demand; and (2) log of distance to the nearest larger (by population) urbanized area

(DISTANCE). While other distance measures may also be useful, ours is plausible and appropriate for our purposes.[8]

The first regression includes only urbanized areas (excluding Los Angeles, for which there is no larger area). If UCSF's definition is to be meaningful, it should apply to smaller cities as well as urbanized areas, since most smaller cities outside of urbanized areas are at least fifteen miles from other cities. We therefore report a second regression that adds all cities outside of urbanized areas with populations exceeding 10,000. The coefficients on POP and DISTANCE are nearly identical in the two models; sample size explains the greater predictive power of DISTANCE in the second regression.[9]

Taken together, our results suggest that distance matters. This is reflected by the substantial number of outflows, and by the significant explanatory power of distance in a predictive model of the Herfindahl index. The implication is that a local market cannot be defined in isolation; one must consider its location relative to other markets.

Concluding Thoughts

Our analysis shows the importance of distance and fringe supply in analyzing the structure of local hospital markets, and by implication, the

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[8] This exogenous measure of distance seems more appropriate than actual distances travelled, which are endogenous. With this definition we make a simplifying assumption that patients who travel are usually travelling to more populous areas, where presumably a broader range of services are available. This assumption is supported by an examination of the flow data. This suggests to us the possibility that market definitions may vary by service.

[9] In unreported regressions, we find that outflows are also significantly predicted by population and distance.

conduct and performance of such markets. While our analysis focused specifically on urbanized areas, we would argue more generally that distance and fringe supply must be considered regardless of the proposed market definition, including but not limited to the UCSF fifteen mile criterion. We suppose that if one chose broader market definitions (i.e., larger geographic expanses), such as the SMSA, or the strict application of Justice Department criteria, then fringe supply would decline in importance (cf. Morrisey, et al., 1989). Such broad definitions are objectionable on other grounds, however, and it is not clear that expanding distance criteria is a way to eliminate the problems discussed above (cf. Werden, forthcoming, and Zwanziger, forthcoming).

Our results also point out the powerful effect of local demand, as represented here by local population, on market structure. In unreported regressions, in which we have tried to more fully explain local market structure and performance, local demand overwhelms other variables, making it difficult to sort out alternative explanations.

Further work is needed to appropriately define markets as a basis for understanding their structure, conduct and performance. Our analysis points out the importance of considering distance, fringe supply, and local demand in such work.

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Table 1

Urbanized Areas: Distances, Outflows, and Capacity Ratios

Urbanized Area	Distance to Nearest Area	Percentage Outflows	"Excess Local Demand" Ratio
Antioch/Pittsburgh	31	59.92	2.39
Bakersfield	107	5.96	1.05
Chico	72	8.46	1.06
Fairfield	15	24.65	1.28
Fresno	47	2.37	.99
Hemet	37	30.39	1.41
Lancaster	60	22.78	1.19
Los Angeles	59	3.01	1.01
Modesto	29	5.23	1.04
Napa	15	13.51	1.10
Oxnard/Ventura	20	28.12	1.22
Palm Springs	37	12.87	1.09
Redding	72	6.74	1.05
Sacramento	42	2.38	1.00
Salinas	15	12.20	1.08
San Bernardino/Riverside	60	8.22	.92
San Diego	124	1.28	.97
San Francisco	44	6.89	1.00
San Jose	27	6.01	.85
Santa Barbara	31	4.35	.93
Santa Cruz	27	11.75	1.10
Santa Maria	58	13.31	1.13
Santa Rosa	52	12.27	.91
Seaside	15	15.08	1.00
Simi Valley	20	50.75	1.82
Stockton	29	6.60	1.06
Visalia	47	12.03	1.13
Yuba City	42	11.04	1.11
Cities 10,000-50,000	>15	37.57*	--

* Unweighted average of fifteen cities.

TABLE 2

Regression Results: Market Structure; Population; Distance

Model 1: Urbanized Areas (N=27; excludes Los Angeles)

HERFINDAHL = 1.86 - .181 POP* - .117 DISTANCE** Adjusted R^2 = .62

Model 2: Urbanized Areas and Cities over 10,000 (N=54; excludes LA)

HERFINDAHL = 1.76 - .171 POP* - .104 DISTANCE* Adjusted R^2 = .66

* $p < .01$

** $p < .07$