

Validity of Repeating Patient Origin Studies for Rural Hospitals

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PATIENT ORIGIN studies are common in hospital research due to the variables influencing changes in the spatial patterns of hospital service areas. For example, one might conclude that a sudden influx of population or physicians into an area would have some effect on the hospital's service area pattern. Similarly, changes in the area's complement of hospital beds may lead to the same conclusion. Few would disagree that an administrator or planner needs to know the extent of a facility's outreach to the potential patient population. Conversely, few people engaged in the business would argue with the fact that patient origin studies, valuable as they may be, are expensive.

This paper conveys some recent research findings indicating that hospital service areas in rural localities may not change appreciably over time. Thus, the need for an up-to-date study of patients' origin may be avoided in some rural areas. The obvious result is an increase in planning efficiency and a corresponding decrease in hospital costs.

Method

The area selected for study consists of 12 counties—10 counties in southwest Idaho and 2 in adjacent southeast Oregon. The 41,706-square mile area is roughly the size of the State of Tennessee. However, unlike Tennessee which has 3,923,780 people, the study area contains only 265,491 (1).

I selected the study area because of three factors: (a) the needed data were easily obtainable, (b) my familiarity with the area, and (c) previous research had indi-

cated that this rural area is comprised of several distinct hospital service areas (2).

Patient Origin Concept

There are various ways in which hospital service or trade areas may be delineated, but the most accepted means is to search hospital admittance records for patients' places of residence. Such a search is known as a patient origin survey. After the record survey is completed, the patients' residences in relation to the hospital are mapped. The hospital planner then has an accurate pattern of that specific hospital's trade area.

First Data Source

The data used for this report came from two sources. The first source was my doctoral thesis (2). Data were collected from eastern Oregon's and southeastern Idaho's hospitals. The sample included all patients discharged from each State's hospitals from September through November 1967. It is believed that in most locations, discharges for these 3 months are indicative of what one could expect under normal conditions throughout the year. However, there may be exceptions. For instance, the Snake River Valley during harvest time has an unknown number of migrant farm workers whose presence might not be fully reflected by data for these 3 months.

For the sake of simplicity, only general hospitals were studied. Specialty hospitals were excluded because they do not necessarily admit all types of patients.

The data were derived from patients' zip code addresses. There-

fore, it was necessary to establish a scale to represent patient flow from one zip code area to different hospitals. For example, Homedale, Idaho (zip code 83628) has no hospital; therefore, it is a patient supply center for nearby cities that have hospitals. The data indicated that Homedale supplies patients to Caldwell (335 patients—13 miles from Homedale), to Nampa (43 patients—24 miles from Homedale), and to Boise (40 patients—44 miles from Homedale). Clearly, the majority of Homedale patients go to Caldwell, the nearest medical center for hospital care.

The criterion selected to determine which hospital service area a place without a hospital was assigned to follows:

A place that supplies 60 percent of its patients or more to one hospital is considered as part of that hospital service area.

Normally, patients in rural areas go to the closest hospital; however, the 60 percent figure was chosen because a physician referral, an irrational choice, or an attractive amenity may cause them to go to a hospital farther away. At any rate, 60 percent is larger than a simple majority and it seemed to be an acceptably large figure.

A data matrix, showing on one axis the hospital centers and on the other, places without hospitals, supports the 60 percent figure. Figure 1 shows the location of hos-

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Second Data Source

pitals, patient supply centers, and hospital service areas derived from the 1967 patient origin study; table 1 shows the patient flow in percentages between places with and without a hospital.

In more than 75 percent of the localities, (16 of 21 places selected) patients did go to the closest hospital (table 1). Five places did not fit this pattern (Glenns Ferry, Horseshoe Bend, New Meadows, Murphy, and Midvale); in three places—Glenns Ferry, New Meadows, and Murphy—simple majorities of the patients went to the closest hospital. However, with the single exception of New Meadows, all showed a tendency for patients

to go to Boise. This situation is not surprising since Boise is the largest center in the area and also has more medical facilities and physician specialists than any other place in the region. To obtain equal or greater facilities or the services of physician specialists, patients would have to travel 428 miles to Portland, Oreg., or 349 miles to Salt Lake City, Utah. The chances that patients would travel this distance are remote, although some do. More important is the fact that the data in most instances supported the contention that a majority of patients in the study area did go to the closest center for hospital care.

The second data source was a health survey conducted in the 12-county study area in January 1973. In that survey, a 2 percent random sample of the population was selected to be interviewed. Ninety-three percent of the households selected participated in the survey, and corresponding checks with the 1970 U.S. Census reports as to age, sex, income, and education indicate the sample population was closely aligned with the actual population.

In the survey, respondents were asked where they went for medical care, how far they traveled, and where they lived. Additionally, the

Figure 1. Hospital and patient supply centers in southwest Idaho and southeast Oregon

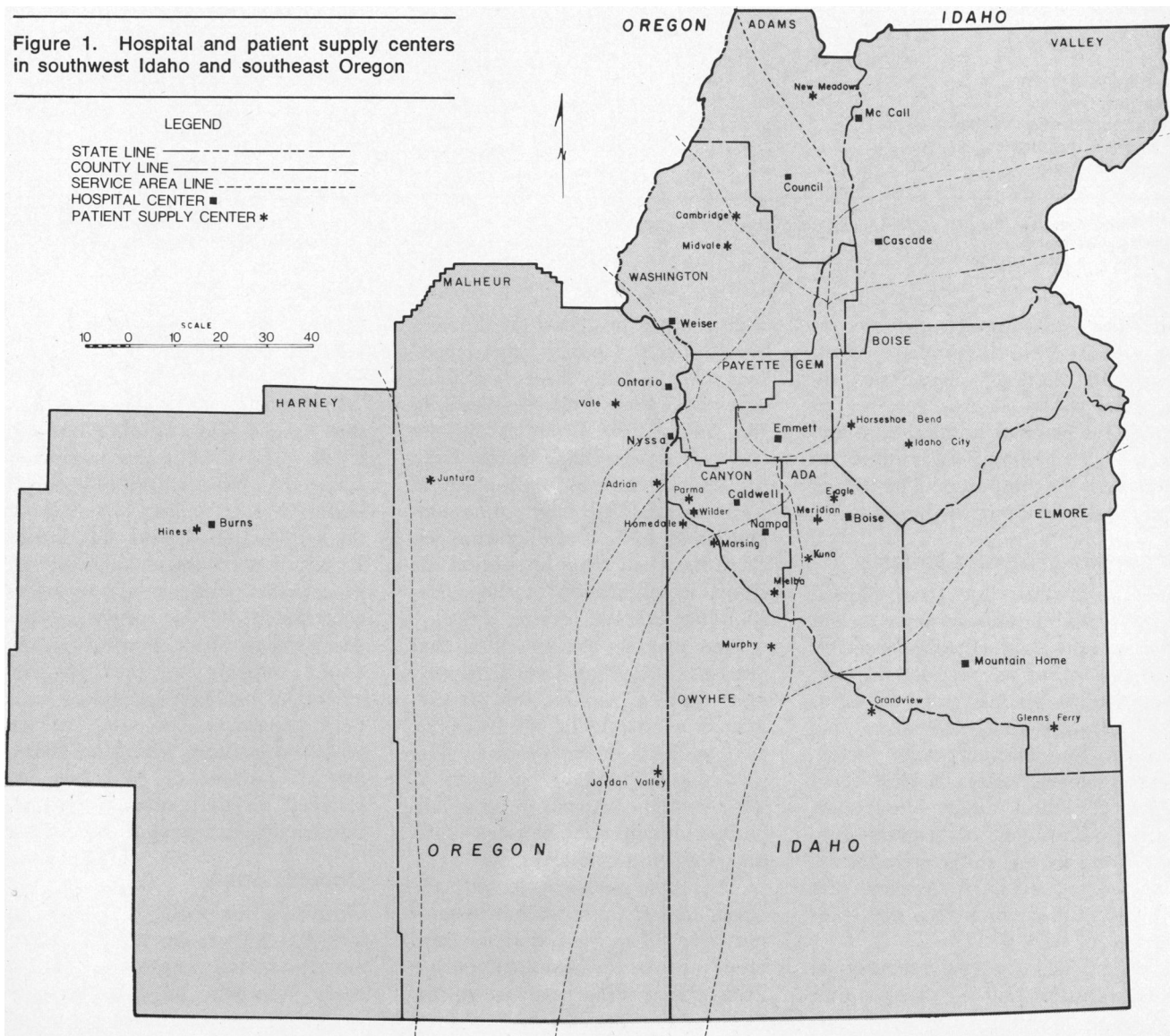


Table 1. Hospital-nonhospital patient flow, September-November 1967, in percentages

No hospital (county and place)	Idaho places with hospitals								Oregon places with hospitals			
	Boise ²	Nampa	Caldwell	Weiser	Emmett	McCall	Council	Cascade	Mt. Home	Ontario	Nyssa	Burns
<i>Idaho</i>												
Ada, Eagle	70.4	4.4	20.1		1.8	3.3						
Elmore, Glenns Ferry ¹	39.6	5.0	2.1									
Owyhee, Grandview	10.1	7.5	6.3							53.3		
Owyhee, Homedale	9.5	10.2	79.1			1.2				76.1		
Boise, Horseshoe Bend ¹	39.3	2.2	5.5		48.1	2.7						
Ada, Kuna	15.6	60.0	22.0			2.4		2.2				
Owyhee, Marsing	6.2	20.2	73.6									
Canyon, Melba	4.6	86.8	8.6									
Ada, Meridian	68.9	24.3	6.8									
Owyhee, Murphy ¹	34.8	43.5	21.7									
Canyon, Parma	14.3	2.9	81.2	0.7		0.9						
Canyon, Wilder	1.6	4.0	94.4									
Washington, Cambridge	6.3			29.2		2.0	62.5					
Boise, Idaho City	76.2				23.8							
Adams, New Meadows ¹	17.8		2.8		2.8	46.1	28.3	2.2				
Washington, Midvale	37.8			26.0			36.2					
<i>Oregon</i>												
Malheur, Adrian		1.1	3.9						10.6	84.4		
Harney, Hines												100.0
Malheur, Jordan Valley		1.4	77.0						6.3	7.4		
Malheur, Juntura									88.4	10.4	1.2	
Malheur, Vale									84.6	15.4		

¹ Places with less than 60 percent of the total patients not going to the nearest hospital.

² Major regional hospital center.

SOURCES: Patient-origin study, unpublished data; Idaho Hospital Association; and Washington-Alaska Regional Medical Program, 1968.

surveyors determined where respondents were hospitalized when inpatient hospital care was required. Thus, it was possible to pinpoint place of hospital care and residence. Distance was used to validate the response. The travel patterns are shown in figure 2.

Changes in Service Areas

In the 6 years that have elapsed since the initial patient origin study, numerous changes occurred in the area in population size, number of hospital beds, or number of physicians. Obviously, the reason for selecting these factors and ignoring others is that these have the most direct bearing on the establishment of hospital service areas in the study area (2-4). The data necessary to assess the changes that occurred are presented in table 2.

Significant changes occurred in each variable, and the changes that

occurred are not constant. For example, Ada County experienced increases in all three variables, whereas Valley, Elmore, Washington, and Adams Counties did not have a similar experience. Even so, several changes took place in each county. One might then conclude that, in light of these changes, there has been some impact on the spatial configuration of the corresponding hospital service areas.

One way to test the idea that changes in significant variables may alter hospital service area boundaries is to match the results of the two patient origin studies. This matching is presented in figure 2. The spatial pattern of hospital-patient interaction between 1967 and 1973 has not changed.

The explanation as to why the boundaries of the service areas have not changed may be that, in rural areas, the prospective patient has little choice of where to go for

hospital care. In reality, he is confined to one hospital by the pressures of time and money. His "confinement" is rather loose in that he can go to another hospital if he wishes, but in southwest Idaho the average distance between hospitals is 40 miles. The bulk of the population would not travel 40 additional miles. Moreover, the prospective patient is probably constrained by his physician because the physician would typically admit patients to the hospitals where he has staff privileges, and most physicians live close to the places where they practice. Therefore, a number of restraints are imposed on the potential patient, influencing his choice of a hospital.

Conclusions

Obviously, the variables selected to indicate changes in hospital service areas were not appropriate in this study. It is quite possible that other

variables, such as change in transportation routes or the building of an additional hospital would have a decided impact; however, these are the recognized factors that alter service areas, and neither occurred in the study area (5,6). It may be that planners of future hospitals should place more emphasis on the population within a service area, rather than focusing on the patient origin study as a means to some end. The data in this analysis tend to support this contention. Also, it appears that in some rural areas the changes over time in hospital service area patterns are so slight as to be imperceptible. Indeed, if the hospital

administrators want to look at potential patients, it would probably be more advantageous and more economical, from the hospital's standpoint, to do a detailed census tract or block study of its known service area rather than become bogged down in another patient origin study. Certainly, the census data are easily available and are not difficult to comprehend. In addition, they, like the patient record, contain potentially valuable information for the hospital planner.

A point of caution is that this study looked only at rural hospitals. The experience of urban health care facilities may not be

similar because of the variety of choices offered to the general consumer. Further testing of the validity of repeated patient origin studies needs to be undertaken at other sites. If these studies are carried out, their results may indicate to planners of rural hospitals that updating patient origin studies produces only marginal benefits.

References

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2. Meade, J. M.: Hospital service areas in Idaho: a geographic ap-

Figure 2. Hospital service area in southwest Idaho and southeast Oregon: a comparison of 1967 and 1973 data

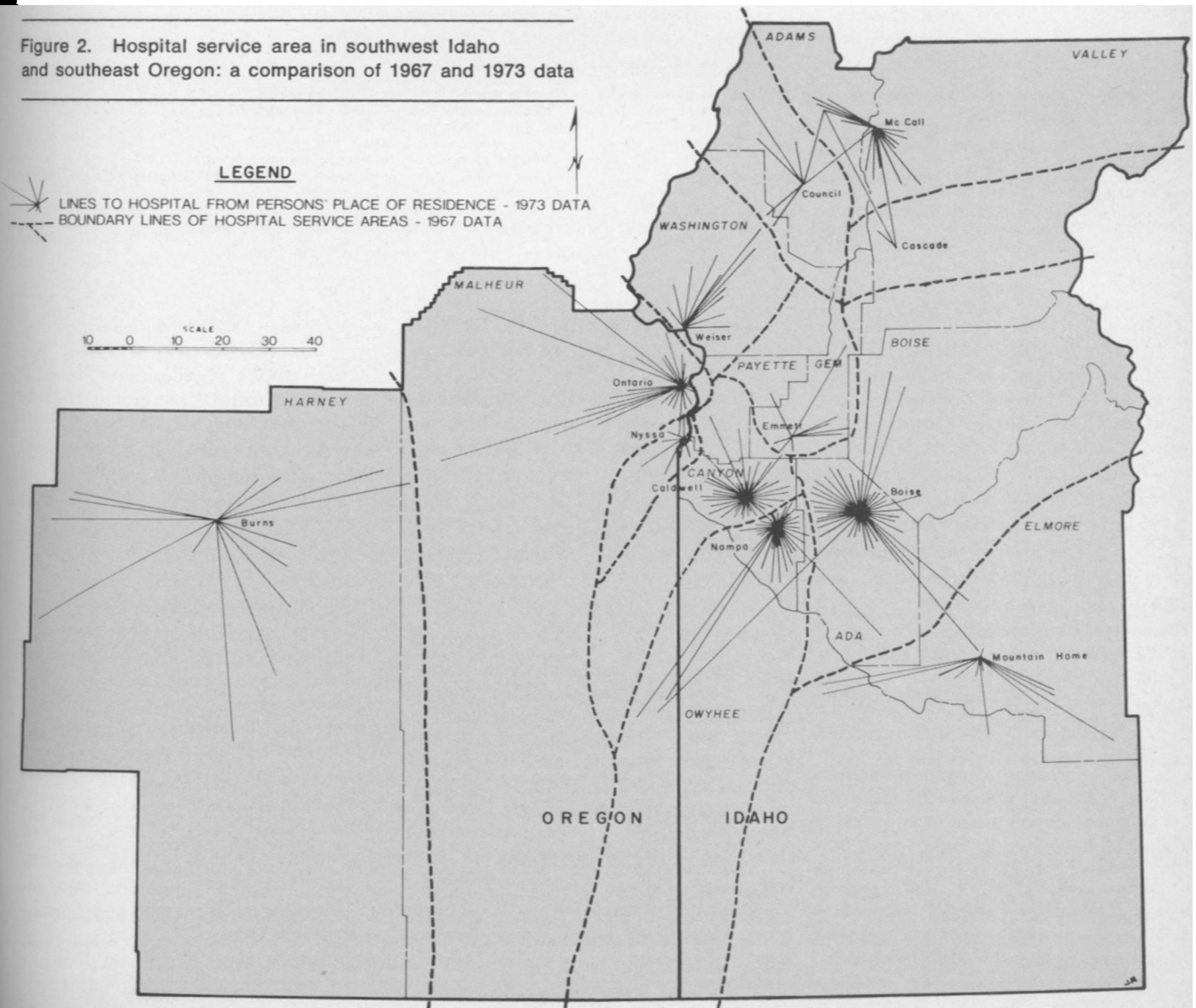


Table 2. County changes in population, number of hospital beds, and number of physicians, 1967-73

County	Population			Hospital beds			Number of physicians ¹		
	² 1967	³ 1973	Percent change	⁴ 1967	⁵ 1973	Percent change	⁶ 1967	⁷ 1973	Percent change
<i>Idaho</i>									
Ada	101,776	122,200	+20.1	304	428	+37.5	150	180	+20.0
Adams	3,192	3,000	-6.0	20	25	+25.0	1	2	+100.0
Boise	1,726	1,900	+10.1	0	0	0	0	0	0
Canyon ⁸	61,884	68,500	+10.7	151	173	+14.6	67	81	+20.1
Elmore	20,093	18,400	-8.4	130	113	-13.1			
Gem	9,704	10,000	+3.1	19	19	0	6	4	-33.3
Owyhee	6,807	7,100	+4.3	49	59	+20.4	4	4	0
Payette	13,372	13,100	-2.0	0	0	0	2	0	-100.0
Valley ⁸	3,917	3,800	-3.0	0	0	0	0	4	0
Washington	8,658	8,200	-5.3	14	9	-35.7	5	6	+20.0
				21	21	0			
				30	34	+13.3	5	3	-40.0
<i>Oregon</i>									
Harney ⁹	22,274	24,000	+8.0	96	148	+54.1	21	26	+23.3
Malheur ¹⁰	6,440	7,120	+9.5	57	49	-14.1	6	6	0
Total	259,843	287,320	+10.6	891	1,069	+19.9	267	316	+18.4

¹ Physicians in active practice, excludes those involved in administration.

SOURCES

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⁴ Health profile: Idaho, 1969. Mountain States Regional Medical Program, Boise, 1969, pp. 269-271.

⁵ Guide issue. Hospitals 47: 63-65 (1973).

⁶ Health profile: Idaho, 1969. Mountain States Regional Medical Program, Boise, 1969, pp. 243-248.

⁷ Idaho Medical Association.

⁸ 2 hospitals in county with separate service areas.

⁹ Health facts: State of Oregon. Office of the Governor, Salem, 1969, pp. 134-146.

¹⁰ Personal communication from Julia A. James, director, Comprehensive Health Planning Association of Portland, Oreg.

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SYNOPSIS

MEADE, JAMES M. (Idaho Department of Health and Welfare): *Validity of repeating patient origin studies for rural hospitals. Public Health Reports, Vol. 91, January-February 1976, pp. 62-66.*

Recent research in southwest Idaho and southeast Oregon indicates that hospital service areas in this rural locality have not changed over time. The 12-county study area includes approximately 42,000 square miles inhabited by only 265,491 people. The focal point of hospital care in this re-

gion is Boise, Idaho, with adjacent smaller centers.

Data used in the paper came from two sources—a patient-origin study completed in 1968 and a health interview survey completed in 1973. In both studies information was collected on patients' places of residence and where they went to receive hospital care.

Because of the 6-year timespan between the studies, it was suspected that there may have been changes in the hospitals' service areas. An ex-

amination of some variables that customarily influence hospital service areas, such as number of physicians, number of hospital beds, and size of population, revealed that, despite sizable changes in all these variables, no appreciable changes were noted in the spatial patterns of the hospitals' service areas.

This result was unexpected, but it may indicate to others engaged in planning for rural hospitals that updating patient origin studies in their areas may produce only marginal benefits.