THE ECONOMIC STRUCTURE AND PERFORMANCE OF THE MEDICAL INDUSTRY IN MICHIGAN'S GRAND TRAVERSE REGION

by

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ABSTRACT

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The objective of this study is to contribute to the search for solutions to inadequate medical care in rural areas. Inadequacy is seen as a lower output of services than needed to meet a population's health care needs; changes in the need for medical care aside, solutions involve increasing the supply of services, or increasing the demand, or both.

The study examines the financial and institutional structure of a rural economy's medical service sector. Four specific questions are asked: What is the cost of providing medical care in a region? How is this expenditure distributed from purchases of medical goods and services to producers and ultimately to input suppliers? Are there excessive earnings of doctors and drug and medical equipment manufacturers as well as inefficiencies in hospital services? What additional expenditures would be needed to increase the supply of services to fulfill the region's needs?

The Grand Traverse Region, the area studied, comprises eight rural counties in northwestern lower Michigan. Supported by fruit and vegetable agriculture and the tourist trade, the region displays outward signs of rural prosperity. Actually this prosperity is only relative; for while the region compares favorably with other rural areas, per capita incomes are quite low and unemployment quite high.

In and around Traverse City a medical service industry of unusual size and scope for a rural area has developed. A major feature is a state

mental hospital that serves a large area and provides employment for many of the region's 100,000 people.

In 1967 medical expenditures in the region were $33.5 million; consumers spent 60.1 percent and government, 38.4 percent; philanthropy and other sources contributed the remaining 1.5 percent. Of the expenditures, 50.1 percent came from sources outside the region. Major recipients were hospitals, 46.3 percent, and professional services, 28.1 percent. Drug stores accounted for 12.9 percent; nursing homes, eyeglass and appliance stores, the public health service, net insurance costs, and miscellaneous items accounted for the remaining 12.7 percent.

When health care expenditures were respent by producers, labor received 62.7 percent and other inputs, 37.3 percent.

The medical industry employed 3,214 people, 8.4 percent of the region's labor force; labor expenditures were $21 million, or 13.1 percent of total labor expenditures. The industry also affected the economy through interregional trade. Payments from nonregional sources for medical services produced in the region exceeded the value of nonregionally produced inputs by $9.5 million--28.0 percent of the region's total medical income.

These findings cast the medical industry in a role previously paid scant attention--as a distinct regional economic force, and in this region, a leading economic force. Also, the findings refute the notion that large medical complexes cannot be economically viable in rural areas.

The average net income of the region's medical doctors was $35,363--36 percent more than that of its dentists. About 17 percent of the difference was attributed to extra costs incurred by doctors, and the rest, to controls of entry into medicine. Excess incomes resulting from these controls were estimated at between $134,000 and $620,000.

Drug manufacturers earned an estimated excess profit rate of 3.88 percent of sales. This rate was calculated by comparing average returns on equity earned by drug manufacturers and all manufacturers and converting to a percentage return on manufacturers' sales revenue. Applied to earnings from drug sales in the Grand Traverse Region, the formula showed excess earnings of approximately $92,000.

A sample of firms producing medical equipment was selected; profit rates were analysed using techniques similar to those used for drug manufacturers. No significant evidence of excess profits was found.

The region's general hospitals operated as a reasonably efficient group. There was approximately the correct number of beds to handle current and expected needs. Average costs were constant, indicating no economies of scale; lower average costs than in comparable hospitals elsewhere indicated relatively efficient, productive techniques. Greater rates of use of the larger hospitals confirmed that the number of services and the quality of care usually increase with hospital size; but advantages were also found in small hospitals, for they can treat simple matters and offer greater convenience for many rural people.

Overall, the region's medical complex performs well and offers more services than often found in a rural area. Nevertheless, the concentration of professionals in Traverse City could mean that some isolated population groups were rather removed from convenient professional help.

It was estimated that an additional 5 general practitioners, 3 dentists, and 45 nurses should be located in the six isolated rural counties to provide an adequate number of professional services. The cost of providing these services was estimated at $666,000. Potential financial sources considered include private consumers, philanthropy, and government. Consumers were an unlikely source because additional services were

needed mainly for the poor; the role of philanthropy in financing health care has been declining; and taxes might have to be raised for government financing. The latter approach, particularly if it were adopted at the federal level, would benefit the region economically because taxes collected would probably be less than expenditures needed for the additional services. Another potential source, government taxation on the excess earnings of doctors and drug manufacturers, would have yielded just about the revenue needed.

The important variables in this study are a region's medical income and its medical needs; in rural areas these are generally low and high, respectively. The Grand Traverse Region is exceptional. In terms of both real and economic contributions, its medical sector could provide policy makers with an additional dimension in their struggle for a reasonable share of health planning funds for rural areas.

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To Glenn Johnson, Clark Edwards, Allan Schmid, Rita Zemach, Al House, Bob Coltrane, and many others from the academic communities at Michigan State University and the U.S. Department of Agriculture; to William Hanson, Kathleen Putnam and others from the Grand Traverse medical community; to all anonymous contacts: American Indians, Congressmen, Migrant Workers, Court House Clerks, People in taverns, People in hospitals, People, whose contributions, big or little, always helped; to "Sam" Sarkar, Barbara Cooper and Angela Wray, who can never know the value of their help; to Otelia Ann Quarles, my typist; to my wife, Barbara, whose endearment, courage and confidence, though sorely tested, prevailed — my sincere thanks.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter I

INTRODUCTION

Some twenty years ago two medical doctors wrote:

> Against a background of unmet medical needs and burdensome medical costs, people are thinking things through and seeking solutions. The majority have lost faith in palliatives, they want concrete results through bold action.[1]

The doctors were writing about a problem which still exists: the inability of many people in rural areas to transform their medical needs into effective demand.

The reason the problem exists is essentially the same now as it was 20 years ago and the same as it was 30 years ago, when an American Medical Association board member noted, "The most important factor determining the character and extent of medical services in a community is the economic one."[2]

Just as a family's income is a major determinant of the medical services it purchases, a region's income level sets bounds on the quantity, quality, and variety of medical services available to its population. Shortages of medical services, in turn, influence the amount of health care received and in rural areas this situation is often aggravated by inaccessibility of services. High incomes can obviate much of

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[1] Frederick D. Mott, M.D., and Milton I. Roemer, M.D., D.P.H., Rural Health and Medical Care (New York: McGraw Hill Book Co., Inc., 1948), p. 557.

[2] R. G. Leland, "Medical Care for Rural America," Rural Medicine, Proceedings of the Conference held at Cooperstown, New York, October 7 and 8, 1938 (Springfield, Illinois: Charles G. Thomas, 1939), p. 228.

the inconvenience associated with inaccessibility, but there are many rural areas characterized by low family incomes. In such areas, poor families may spend a high percentage of their income on medical care yet total area medical spending will be low.[3] The result is that the levels of available services are low quantitatively and usually qualitatively as well.[4]

The preceding comments view regional and personal medical problems from the same angle: from the relationship between affluence and availability of health care. Yet it is frequently argued that access to adequate health care is a social right, akin to access to education, and that, consequently, the distribution of health services and the ability of people to receive care should not be dependent on the rigors of an enterprise market system. Much has been done in recent years to protect certain sectors of the population from the market for health care. Medicare, Medicaid, and preschool health programs are examples of such efforts conducted by public authorities; privately, there has been a large increase in the use of medical insurance plans. Even so, to be aware of current commentary is to be aware that there is widespread public dissatisfaction with both the cost and the uneven distribution of medical care.

The present study is the second in a series which examines the aforementioned problems from a regional perspective.[5] The studies are

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[3]Ronald Andersen and Odin W. Anderson, A Decade of Health Services (Chicago: The University of Chicago Press, 1967), p. 56.

[4]President's National Advisory Commission on Rural Poverty, Rural Poverty in the United States (Washington: U.S. Government Printing Office, 1968), p. 315.

[5]The first study, The Copper Country Medical Industry of Michigan as It Serves Rural People, was the subject of Dr. Shyamalendu Sarkar's

primarily concerned with investigating the economic structure of a region's health care delivery system in order to determine the extent to which the region's health needs are fulfilled, the efficiency with which this is achieved, and the possibilities that exist for improvements that could either reduce costs, increase the availability of medical services, or both.

Objectives

Specific objectives of the present study are:

1. To develop and apply a framework for describing the income and expenditure accounts of a region's medical industry.

2. To investigate the possibility of and quantify the extent of excessive medical spending attributable to inexplicably high incomes of medical doctors, excessive profits in the drug and medical equipment industries, and inefficiencies in hospital organization.

3. To relate income and expenditure patterns and excessive spending to the region's medical needs in terms of fulfilling these needs either with the present, or the addition of extra health resources.

Hypotheses

A basic proposition is that in any given region there exists imperfections in the health care delivery system which are evident in terms of unnecessarily high expenditures for given amounts of care, or in an inadequate supply of medical services to meet the region's needs, or in both.

Ph.D. dissertation at Michigan State University. Reference: No. 1969-5, Michigan State University, East Lansing, Michigan, 1969.

The validity of the proposition will be investigated with respect to four sectors of the medical industry: medical doctors, general hospitals, the drug industry, and the medical equipment industry.

Hypotheses are that: (1) medical doctors' incomes are greater than other professionals' by more than can be explained by income equalizing differentials, the greater difference resulting from restrictions on the supply of medical doctors; (2) noncompetitive practices pervade the markets for products of the drug and medical equipment industries, and consequently these industries earn abnormally high profits; and, (3) the spatial organization, rates of use, and cost structure of the general hospitals are distorted, consequently hospital services are produced inefficiently.

Method of Analysis

Descriptive and analytical methods will be used to develop the income accounting framework of a regional medical economy and to investigate the sources of imperfections affecting that economy.

The income accounting framework will be based on estimated gross incomes of the various medical sectors and will be developed to show the sources from which incomes are derived and the subsequent expenditure patterns. Income sources include the major purchasers of health services: consumers, governments, and philanthropists. Subsequent expenditures involve the allocation of these incomes by their recipients to factors of production: labor, land, and capital.

An addition to the framework will be the division of the income and expenditures according to their regional orientation. That is, funds from sources outside the region will be regarded as payments for exports of medical services and funds subsequently spent outside the region will

be regarded as payments for imports. The utility of this approach lies in its pointing the way to evaluating the relevance of the medical industry to regional economic performance.

The income data developed in the accounting framework are necessary for the analysis of market imperfections in that they provide the raw material for quantifying the findings. The initial examination of the imperfections hypotheses, however, will bear little relation to the regional income and expenditures analysis. That is, it is desired to develop general methods of testing that do not depend upon the region. Once this is accomplished the results can be quantified with regional data and evaluated from the regional perspective.

An analysis of doctors' incomes will be based on the work of Friedman and Kuznetz.[6] They showed that medical doctors' incomes are approximately 32 percent higher than dentists', yet only 17 percent is explainable by greater training costs. They attribute the balance to the power of the profession to control the supply of physicians. The author's findings, modified by current conditions, will be used to evaluate the incomes of the region's physicians to determine the amount, if any, that can be attributed to market controls.

An analysis of the drug industry will be based primarily on evidence presented at congressional inquiries into the monopolistic status of the industry. Data will be presented which show that the industry has successfully exploited its market power to enable it to earn excessive profits. Profit differentials attributable to the industry's market control will be analyzed with the use of methods developed by

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[6]Milton Friedman and Simon Kuznetz, Income From Independent Professional Practice (New York: National Bureau of Economic Research, 1949).

Bain for comparing profit rates among different industries.[7] These differentials will then be applied to the industry's regional earnings to determine excessive spending on drug products.

Paralleling the examination of the drug industry's profits will be an examination of the medical equipment industry's profits. But since there is no previous research into the competitive structure of this industry, the hypothesis is based on the observation that it serves somewhat similar market needs as the drug industry, and that a large share of the market is concentrated among a few firms. Given the rapid increases in medical spending that have occurred in recent years, it is a matter of interest to determine whether the medical equipment industry has been able to derive benefits by way of high profits. Accordingly, a representative sample of the firms in the industry will be selected. Their average profit rate will be calculated and used as an estimate of the industry profit rate. This rate will be compared with profit rates in other industries to determine whether or not evidence of excess earnings is present. Should such excesses be found, an approach similar to that used for the drug industry will be used to determine the regional implications.

An analysis of sufficiency and efficiency in organization and utilization of a region's hospital facilities will be based on tests to determine how closely the actual number of hospitals and the distribution of hospital beds conform with optimum regional needs. Three regional hospital planning criteria will be used. Each considers optimum bed needs under a distinct organizational system: the first with autonomous hospitals

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[7]Joe S. Bain, "Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-1940," Quarterly Journal of Economics, LXV (August, 1951), 293-324.

the second with fully cooperative hospitals, and the third with semi-cooperative hospitals. The long-run cost structure of the hospitals will be examined for evidence of increasing returns. A positive finding in this respect would indicate the possibility of lower costs, were hospital facilities consolidated in larger plants. Also, average costs of the hospitals will be compared with costs for similar hospitals elsewhere to determine whether there is a reasonable likelihood of effecting savings through modification of production techniques.

Finally, attention will be paid to the quantity and quality of services provided by the hospitals to determine whether they indicate the necessity for modifications in the previous findings.

A synthesis will be made of the income status of the region's medical industry and the areas in which potential savings exist. The relationship of this synthesis to the region's unmet health needs will be explored. These needs will be expressed in terms of services needed to bring the region up to national adequacy standards. Costs of providing additional services will be calculated and alternative financial sources will be considered. Due consideration will be given to the medical industry's income to determine what, if any, relationship exists between excessive incomes and the need for more services.

Geographic Area of Study

The criterion governing the selection of the study region was that it be composed of a relatively homogeneous group of rural counties in Michigan. The definition of rurality was to be based on some widely

accepted classification. It was decided to use a grouping, based on population and proximity to densely populated areas, developed by the U.S. Public Health Service.[8]

Five types of counties have been delineated, the first two being determined by the standard metropolitan statistical areas established by the Bureau of the Budget. The counties that constitute the SMSA's with populations of 1 million or more inhabitants are called greater metropolitan; the counties that constitute the SMSA's with populations between 50,000 and 1,000,000 are lesser metropolitan. Counties contiguous to the SMSA counties are called adjacent; although they may be sparsely populated, they are nevertheless relatively close to metropolitan areas and to the health facilities ordinarily available in such centers. All other counties are called isolated--isolated semirural if they contain at least one incorporated place of 2,500 or more persons; otherwise, isolated rural.

The 3,081 counties in the United States are thus classified as 109 greater metropolitan (group 1), 301 lesser metropolitan (group 2), 889 adjacent to metropolitan (group 3), 1,024 isolated semirural (group 4), and 758 isolated rural (group 5). About two-thirds of the U.S. population live in metropolitan counties. An additional 16 percent live in counties contiguous to metropolitan counties. Counties to be studied were chosen from the fourth and fifth, or predominantly rural groups.

It was decided to select a number of counties located in the northwestern part of Michigan's lower peninsula which could be visualized as

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[8] M. Y. Pennel and M. E. Alrenderfer, Health Manpower Source Book 4, County Data for 1950 Census and Area Analysis, Public Health Service Publication No. 263, Sec. 4 (Washington: U.S. Government Printing Office 1954).

an identifiable multicounty region. That is, a region composed of counties relatively similar in physical, social, and economic characteristics, and containing at least one city or town that could be regarded as a development center. The region selected is known as the Grand Traverse Region. It is composed of Antrim, Benzie, Crawford, Grand Traverse, Kalkaska, Leelanau, Missaukee, and Wexford Counties; the development center is Traverse City.

Selection of Time Period

The period chosen for study is the calendar year 1967. In some respects more accurate and complete data are available for 1965 and earlier years. But these years were prior to the advent of Medicare and Medicaid. These programs have had a substantial impact on medical expenditures, thus the loss in relevance would be greater than the gain in accuracy were 1965 or an earlier year chosen. The year of transition was 1966, when many public and private sectors of the medical industry were adjusting to the impact of government programs. Spending represented only a half a year of operation and Medicaid was in its infancy. Thus, it was felt that 1966 data would be quite unrepresentative and lead to inaccurate interpretations. However, 1967 saw the completion of the first full year of Medicare and greatly increased participation in Medicaid. It was, furthermore, the latest year for which reliable data were available and the first year for which reliable data were available regarding new public expenditures.

Thus, the period relevant to this study is the calendar year 1967. Where data are only available for earlier years or on a fiscal year basis, the necessary imputations will be made explicit.

Plan of Work

Chapter two is a review of problems and research pertaining to the adequacy of health care in rural areas. Some of the crucial problems are explained and the medical industry is discussed from the perspective of the cost of medical care and the industry's economic structure.

Chapter three describes the Grand Traverse Region's major economic and geographic characteristics with emphasis on the rurality of the area.

Chapter four, which describes the region's medical industry, includes an account of the available medical services and facilities and looks at them in terms of their quantitative and qualitative reflections of the area's needs. The chapter intends to show what is available to the population, how the region compares with other rural areas, and what potential problems exist relative to the availability of services and the actual and potential needs of the population.

The basic accounting framework is presented in chapters five through eight. Chapters five and six examine the flow of funds between consumers and producers of health services. Chapter seven considers the redistribution of these funds from producers to input suppliers. The findings of these three chapters are consolidated in chapter eight and some special attention is paid to the economic consequences of the inter-regional trade induced by the medical industry.

The following three chapters--nine, ten, and eleven--involve chapter-by-chapter development and analysis of the hypotheses regarding excess incomes earned in the area by medical doctors, the drug industry, and the medical equipment industry. In each case the excess income concept is developed in general and accepted or rejected on the basis of the available evidence. High and low estimates are than made of regional medical expenditures dissipated in excessive income. Chapter 12 investigates the

impacts of the relationship between potential organizational deficiencies and hospital costs.

The concluding chapter reviews findings of the preceding chapters and relates the findings to unmet needs and to transformation of felt needs into effective demands. The capacity of the region's medical industry to fulfill these demands is evaluated both in terms of its existing organization and financial structure and in terms of an optimum organization and financial structure.

Chapter II

RURAL HEALTH AND THE MEDICAL INDUSTRY

The purpose of this chapter is to expand introductory statements about unfulfilled health needs and the market structure of the health care delivery system. Economic characteristics of the demand for health care are first examined. This is followed by a discussion of how these characteristics create special difficulties in rural areas and how these difficulties are complemented by the distribution of medical services. Then some pertinent, economic characteristics of the medical industry are reviewed.

The Demand for Medical Care

In 1967, the American public spent $33 billion on medical care--$18 billion more than in 1957. During the 10-year period, the amount of money spent for medical bills more than doubled; there was a 40 percent increase in real expenditures as medical expenditures increased from 5 to 10 percent of disposable personal income; and medical costs increased faster than any other major category of personal expense shown in the Consumer Price Index.[1]

From a 1957-59 base period to 1967, expenditures for hospital care rose 174 percent to a total of $10 billion; expenditures for physicians' services rose 129 percent to $9 billion; and expenditures for appliances

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[1] 1968 Source Book of Health Insurance Data (New York: Health Insurance Institute, 1969), p. 53.

and medicines rose 86 percent to $7 billion. Individual services with the greatest increase in costs were hospital room rates and physicians' fees.

The simple economic explanation of these increasing expenditures may be found in the forces of demand and supply. The demand for medical care is relatively inelastic with respect to price.[2] Thus, an increase in the price of medical care relative to the prices of other goods and services means that the decrease in the quantity demanded will be relatively less than the increase in price. The exact value of the elasticity coefficient is unknown; it has been suggested that it may be as low as 0.2 percent.[3] This implies that if prices rise by 10 percent, the quantity demanded decreases by only 2 percent, ceteris paribus. Other researchers investigating the demand for individual medical services found elasticities of 0.0 for hospital care and 0.2 for physicians' services.[4]

A second component of the price of medical care is the consumers' opportunity cost. Depending on factors such as a person's type of employment and his age, sex, and distance from medical facilities, the real price may vary substantially from the actual medical fee. Thus, the price for the unemployed and the retired, for example, is actually lower than for those who must forego income to receive care. The real cost to

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[2]Paul J. Feldstein and Ruth M. Severson, "The Demand for Medical Care," in Report of the Commission on the Cost of Medical Care, I (Chicago: American Medical Association, 1964), 57-76.

[3]Victor R. Fuchs, "The Basic Forces Influencing Costs of Medical Care," in U.S. Department of Health, Education, and Welfare, Report of the National Conference on Medical Costs (Washington: U.S. Government Printing Office, 1967), pp. 16-31.

[4]Feldstein and Severson, Report of the Commission on the Cost of Medical Care, I, 76.

farmers may be higher than for any other large group of workers. Not only is the farmer often relatively isolated from the sources of care so that he, and maybe his family, incur high traveling expenses, but he is frequently an independent operator for whom incapacity at crucial times, such as harvest, could involve the loss of a large share of his annual income.

Income is a major factor influencing the demand for medical care. While the demand can usually be reckoned to increase with income, what is unclear is the degree of elasticity. That is, does a percentage increase in income lead to a greater, smaller, or equal percentage increase in the demand for care? Stigler, using pre-1965 data, calculated urban families' income elasticities for some medical services. He found that income elasticity was less than one for physician services and more than one for dental services. He also calculated income elasticities for physician services by income class for 1935-36. The elasticity in each class was less than one, but rose with income from 0.52 at $1,000 to 0.81 at $6,000.[5] In a more recent study using 1917-60 data, Feldstein and Carr found the estimated average income elasticity of demand for medical care to be 0.7.[6] They also approximated income elasticity, from city averages and subset cross sections, as greater than one in 1950 and less than one in 1960. The latter estimate may be biased downwards, however, by the exclusion of third party payments.[7] Furthermore, all of these

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[5]George J. Stigler, The Theory of Price (rev. ed.; New York: Macmillan Co., 1952), pp. 50-52.

[6]Paul J. Feldstein and W. J. Carr, "The Effect of Income on Medical Care Spending," paper presented at the meetings of the American Statistical Association, December 1964. Reprinted in: American Statistical Association Journal, LX (June, 1965), 658.

[7]Note: Insurance coverage has grown substantially in the past 20 years. Studies have shown that the demand for health care increases with

estimates may be too low because the measure of income is current income rather than permanent income. Inclusion of health insurance and permanent income would increase the elasticity, so a realistic estimate is that, in general, the demand for medical care increases approximately proportionately to income. This means that increases in the share of total expenditures accounted for by medical care cannot be attributed to growing incomes alone.

Other factors related to the demand for health care are sex, age, and locality. The first is irrelevant to this study, though it should be noted that, except as young children, women consistently demand more health care than men do.[8] Age and locality are relevant, however, and the next section will show how they, along with income, interact to the detriment of rural health needs.

Utilization of Health Services in Rural Areas

Other factors notwithstanding, income is usually singled out as the major determinant of both the demand for medical care and the supply of medical services. This factor is effective at the individual level in terms of the individual's ability to obtain the health care he wants or needs, and it is effective at the regional level in terms of an area's ability or inability to finance an adequate health delivery system. People living in rural areas tend to be disadvantaged in both respects because per capita incomes and population densities are, relative to urban areas, generally low.

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insurance; also that the more insured a person is, the more unresponsive he is to increases in medical prices. Feldstein and Severson, Report of the Commission on the Cost of Medical Care, I, 57-76.

[8] Ibid., p. 28.

Results of surveys conducted a few years ago show that most people in the United States relied on medical doctors for their regular source of care, and that 87 percent of the population had a regular source. Twelve percent of the people surveyed had no regular source of care and 10 percent relied on clinics. These latter characteristics and low rates of insurance coverage were most prominent among low-income families (Table 1). Furthermore, variations by type of service have been maintained through time despite increases in the absolute use of health services by the poor.[9]

Income differentials are particularly pronounced in the incidence of chronic activity-limiting conditions. The percentage of people with chronic conditions increases markedly as family incomes decrease (Table 2). Part of this result is explained by high incidences of illness among older people and the fact that a disproportionate number of oldsters live in low-income families. However, when the figures in Table 2 are corrected for age differentials, the results show that regardless of age, relatively low family incomes are associated with relatively high incidences of chronic activity-limiting conditions (Figure 1). There can be little doubt that restrictions on the amount or kind of work that can be performed by poor people are major factors in this relationship.

Income and age are not alone in their relationship to expenditures and the incidence of illness. Urban families spend more for health care than do rural families; yet the latter have more chronic illnesses (Tables 3 and 4). Higher urban prices and incomes and greater rates of use of medical services by urban families account for some of the differences. But for the most part, this serves to emphasize the fact that incomes are

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[9]Andersen and Anderson, p. 151.

TABLE 1.--Percentage distribution of regular health care and insurance coverage, by family income, 1963-65

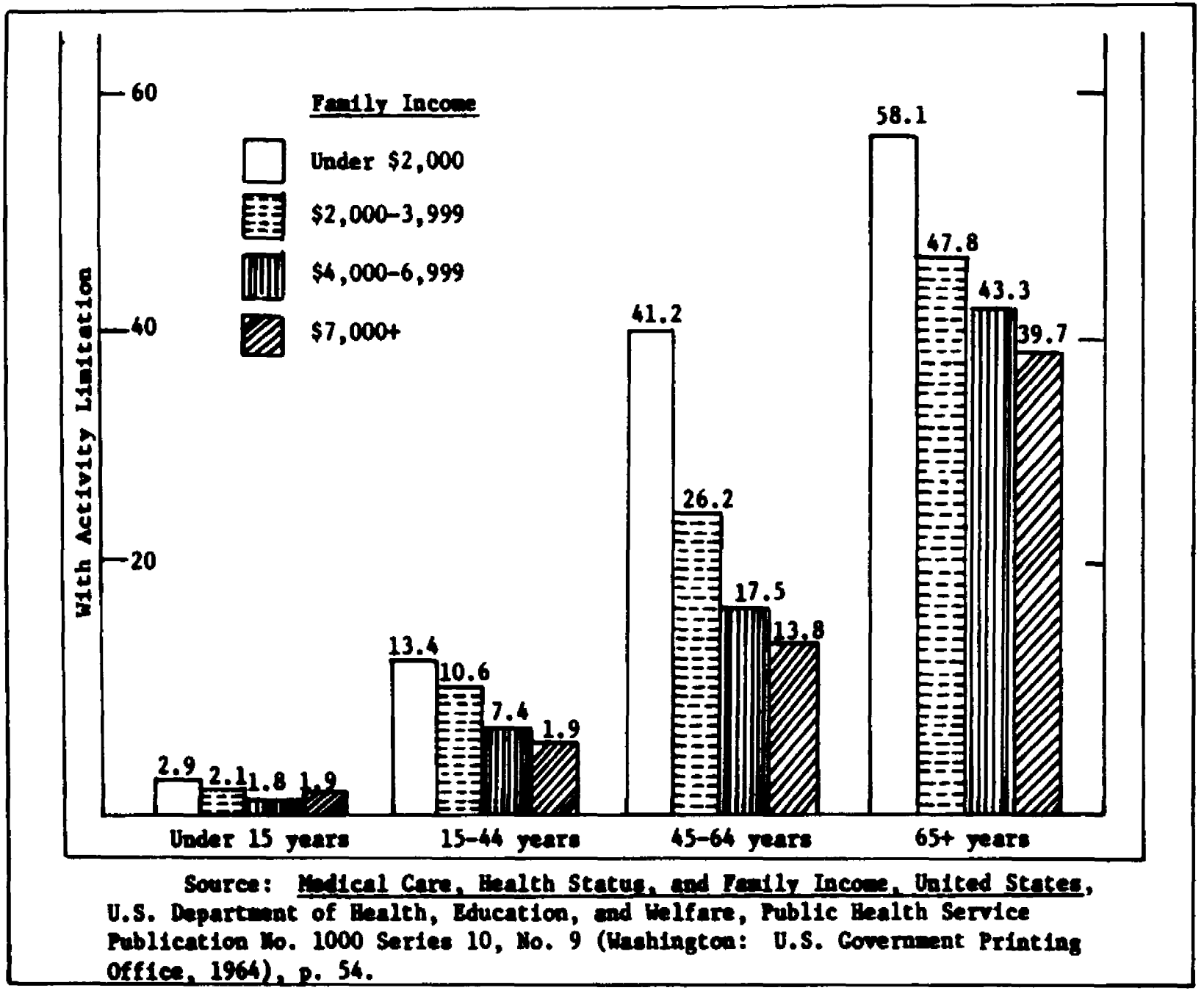
Family income	Specialist	General practitioner	Clinic	Osteopath	None	Insured
	Percent					Percent
Under $3,999. . .	20	43	17	4	16	51
$4,000-$6,999 . .	29	46	10	4	11	78
$7,000-and over .	38	37	7	6	12	89

Source: Ronald Andersen and Odin W. Anderson, A Decade of Health Services (Chicago: The University of Chicago Press, 1967), p. 14.

TABLE 2.--Percentage of persons with activity limitation attributable to chronic conditions, by family income, July 1962-June 1963

Income	Percentage
	Percent
All incomes.	12.4
Under $2,000	28.6
$2,000-$3,999.	16.0
$4,000-$6,999.	8.9
Over $7,000.	7.9

Source: Health Characteristics by Geographic Region, Large Metropolitan Areas, and Other Places of Residence, U.S. Department of Health, Education, and Welfare, Public Health Service Publication No. 1000, Series 10, No. 36 (Washington: U.S. Government Printing Office, 1967), p. 5.



Source: Medical Care, Health Status, and Family Income, United States, U.S. Department of Health, Education, and Welfare, Public Health Service Publication No. 1000 Series 10, No. 9 (Washington: U.S. Government Printing Office, 1964), p. 54.

FIGURE 1.--Percentage of persons with one or more activity-limiting chronic conditions, by family income, July 1962-June 1963

TABLE 3.--Mean expenditure for all personal health services per family by residence, 1963

Residence	Mean expenditure
	Dollars
Large urban.	404
Other urban.	373
Rural nonfarm.	353
Rural farm	302

Source: Ronald Andersen and Odin W. Anderson, A Decade of Health Services (Chicago: The University of Chicago Press, 1967), p. 55.

TABLE 4.--Percentage of persons with chronic-activity limitations, by place of residence, 1963-1965

Residence	Unadjusted for age	Age adjusted[a]
	Percent	
Large urban.	9.8	9.8
Other urban.	11.4	11.9
Rural nonfarm.	14.6	14.1
Rural farm	16.5	15.4

[a]Age adjusted means that the effects of uneven age distribution among residences have been removed.

Source: Health Characteristics by Geographic Region, Large Metropolitan Areas, and Other Places of Residence, U.S. Department of Health, Education, and Welfare, Public Health Service Publication No. 1000, Series 10, No. 36 (Washington: U.S. Government Printing Office, 1967), p. 5.

lower in rural areas than in urban areas; consequently, rural people lack the means with which to fulfill their health needs and hence reduce the incidence of illness.

So far this discussion has dealt mainly with individuals and how their income or residence may be related to the use of health services. It was shown that, in general, low incomes and rural residency are likely to be associated with inadequate health standards. To see why this should be a particularly pressing problem in rural areas relative to urban areas where low-income families also exist, it is necessary to consider the relative availability of health services.

The Location of Medical Services

Prominent among factors influencing the location of medical facilities and personnel are population densities and regional incomes. Tables 5 and 6 show the relationship between these factors and the distribution of medical doctors and hospital facilities in the United States and in county groupings.

The county groups range from the most urban and densely populated (group 1), to the most isolated and sparsely populated (group 5). Income levels decline as rurality increases from group 1 to group 5. The ratios of physicians to population and to income decline as rurality increases. Much of this decline is accounted for by the concentration of specialists and hospital-based physicians in urban and high-income areas. General practitioners are evenly distributed by population density and distributed "favorably" towards low-income counties. Sparsely populated and low-income counties have relatively more hospitals, but that they tend to be smaller and less adequately staffed than hospitals in urban, high-income counties is shown in Table 7.

TABLE 5.--Medical doctors and hospital facilities per 100,000 population, United States and county groups, 1966[a]

Personnel and facilities	U.S.	County group				
		1	2	3	4	5
		Percent				
Distribution of population by county groups	100	35.8	30.5	15.7	14.7	3.2
		Number				
Physicians in patient care	125	171	123	73	81	43
General practitioners	33	34	28	35	36	35
Specialists, plus hospital-based physicians	92	137	95	38	45	8
Hospitals	2.9	1.8	1.9	4.0	5.3	6.3
Hospital beds	381	401	381	323	412	209

[a]The county group classification is explained on page 8.

Source: See Table 6.

TABLE 6.--Medical doctors and hospital facilities per $100 million personal income after tax, United States and county groups, 1966

Personnel and facilities	U.S.	County group				
		1	2	3	4	5
		Dollars				
Income per household	7,990	9,346	8,082	6,687	6,302	5,032
		Number				
Physicians in patient care	52.7	59.5	52.0	38.1	44.9	30.0
General practitioners	13.9	11.8	11.9	18.3	19.7	24.4
Specialists, plus hospital-based physicians	38.8	47.8	40.2	19.9	25.3	5.6
Hospitals	1.2	0.6	0.8	2.1	2.9	4.4
Hospital beds	160.9	139.8	160.7	167.9	227.7	144.9

Source: American Medical Association, The Distribution of Physicians, Hospitals, and Hospital Beds, in the United States, 1966 (Chicago: American Medical Association, 1967).

TABLE 7.--Distribution of beds per hospital and specialists and hospital-based physicians per 100 beds, United States and county groups, 1966

Item	U.S.	County group				
		1	2	3	4	5
		Number				
Average number of beds per hospital.	133	227	197	81	78	33
Specialists, plus hospital-based physicians, per 100 beds.	24.1	34.2	25.0	11.8	11.1	3.8

Source: American Medical Association, The Distribution of Physicians, Hospitals, and Hospital Beds, in the United States, 1966 (Chicago: American Medical Association, 1967).

Tables 4-7 present more evidence for believing that with respect to medical services, the rural environment has special problems. The low income and sparsity problems that limit use of health services in rural areas also make rural locations unattractive to doctors and nurses. Not only is the supply of medical personnel in relation to population lowest in rural areas, but to make matters worse, physicians have been redistributing themselves towards urban areas.[10]

Additional insights can be gained by considering the relative qualifications of rural physicians. There are few specialists, urbanization being a much stronger factor in the location of specialists than in the location of general practitioners. This means that immediate health needs of rural people are in the hands of general practitioners or, sometimes, paramedical substitutes. While the general practitioner may have certain humanistic advantages, he is often required to refer patients to

[10]Gaston V. Rimlinger and Henry B. Steele, "An Economic Interpretation of the Spatial Distribution of Physicians in the U.S.," Southern Economic Journal (July, 1963), pp. 1-12.

specialists to provide sound medical service for serious illnesses. This may be particularly true of the rural practitioner who, because of the isolation of his location and his tendency to be older than his urban counterpart, may be deprived of opportunities to keep up with advances in medical care.

In terms of facilities, it is noticeable that while bigger hospitals are located in urban areas, the actual bed supply in rural areas is not dissimilar from the urban supply. But bed quantities indicate little about the adequacy of hospital care. Small hospitals cannot offer the quality or quantity of services large ones can, and it is to small hospitals that rural people must usually go. Small hospitals are more often inadequately staffed and poorly equipped, and frequently lack out-patient and extended care facilities. They seldom have rigorous policies for medical staff organizations so they are less likely to meet quality standards needed for accreditation.

The preceding paragraphs suggest that the supply of medical services is concentrated in urban, high-income places and that simple urban-rural comparisons hide variations in quality. While quantitative differences are important, very serious problems are related to qualitative differences. Attempts that have been made to measure qualitative differences in medical care indicate that it declines with regional per capita incomes and population densities.[11]

The picture has now been presented from two sides: unmet health needs of rural people and the concentration of supply of health services in urban areas. Were incidence of sickness alone to determine the

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[11]David S. Ball and Jack W. Wilson, "Community Health Facilities and Services: The Manpower Dimension," American Journal of Agricultural Economics, L (December, 1968), 1217.

demand for medical care, more medical services would locate in rural areas. Sickness, however, only expresses itself in a need for care. Income and accessibility do much to determine how these needs are transformed into a person's effective demand. These conclusions follow from a simple interpretation of economic laws of supply and demand. But the interpretation is too simple. If supply and demand were operating unencumbered, in a relatively open market, it would be hard to understand why so much of the adjustment to increasing demand has occurred through price increases and so little in supply increases. A look at the structure of the medical industry may clarify the paradox.

The Economic Structure of the Medical Industry

The major factors of production in the output of medical services are labor and capital. The supply of labor in many sectors of the medical industry is elastic; the industry does not have to pay unusually high wages in order to attract a larger fraction of the labor force. Since World War II, medical care employment has increased by about 5 percent annually, compared with a total employment increase of about 1 percent annually. Yet medical wages have been increasing at about the same rate as wages in other industries.[12] Nevertheless, manpower inputs have not increased as fast as the demand for services. While consumer spending more than doubled between 1957 and 1967, the number of physicians increased only 20 percent, the number of nurses, by about 65 percent, and the number of medical aides and technicians, by about 63 percent. The gap between the supply of manpower and the demand for services has been closed somewhat by increased medical technology and by substitution of lesser trained for higher trained medical personnel. But at the same

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[12] Fuchs, p. 23.

time there have been longer delays in receiving services and the prices of most medical services have been rising rapidly.[13]

Nonhuman capital flows mainly into hospitals. But because most hospitals are nonprofit-oriented and do not compete with other institutions for customers, capital expenditures are usually financed from taxation or donations rather than loans. As a result, until recently, hospital administrators have often distinguished operating expenditures from capital expenditures; the latter being treated as free goods. In consequence, hospital charges have not necessarily reflected the costs of capital and hospitals have not been operated at rates of output that would economize on the use of capital resources.[14]

Productivity

Increases in productivity mean increases in output that exceed those of the input factors. Changes in the supply of medical services in terms of changes in price-quantity relationships depend largely on increases in productivity. It has been argued that productivity in medical care has advanced slowly relative to other sectors in the economy. Wasteful practices are usually cited as the cause, with hospitals invariably used as examples of big wasters.[15]

The development of productivity measures for medical services, however, is beset with unsolved problems. For one thing, the real

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[13] Report of the National Advisory Commission on Health Manpower, I (Washington: U.S. Government Printing Office, 1967), 10.

[14] Millard F. Long, "Efficient Use of Hospitals," in The Economics of Health and Medical Care (Ann Arbor, Michigan: University of Michigan, 1964), p. 213.

[15] Seymour E. Harris, The Economics of American Medicine (New York: Macmillan Co., 1964, p. 34; Fuchs, p. 24; and E. Richard Weinerman, "Trends in the Economics and Organization of Medical Care," The Yale Journal of Biology and Medicine (August, 1963), pp. 53-74.

contribution of medical attention to health is unknown; for another, hospital productivity measures derived by dividing expenditures by the hospital components of the consumer price index are likely to be low because the output of hospitals includes items such as hotel services that do not necessarily contribute directly to improved health.[16]

A visit to a physician or a day spent in the hospital is undoubtedly more productive now than it was several years ago. But there may be some modern techniques with a low marginal contribution in terms of curative value, but whose cost is so high that a greater contribution could be obtained were the resources to be used in alternative ways; heart transplants and artificial kidney devices are two techniques against which such criticisms have been levied.[17]

Market Imperfections

Lack of competition among producers of services and products is commonly asserted as a major cause of the dramatic increases in the price of medical care. Physicians, drug manufacturers, and hospitals have borne the brunt of the assertions.

Reuben Kessel, drawing on a wide array of sources, has prepared a persuasive indictment of physicians' ability to use price discrimination and other monopolistic practices to further their monetary gain.[18] The drug industry, probably the most thoroughly and frequently attacked of

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[16]Howard Lee Bost, "An Analysis of Charges Incurred for Inpatient Care in General Hospitals" (unpublished Ph.D. dissertation, University of Michigan, 1955), p. 48.

[17]Henry K. Beecher, "Scarce Resources and Medical Advancement," Daedalus, Journal of the American Academy of Arts and Sciences (Spring, 1969), pp. 275-313.

[18]Reuben A. Kessel, "Price Discrimination in Medicine," The Journal of Law and Economics, I (October, 1958), 20-53.

all American industries with respect to noncompetitive behavior, has been the subject of major congressional inquiries. Price fixing, multiple pricing, and other restrictive market practices have been shown as common behavior in the industry.[19] Hospitals have come under attack most frequently for operating inefficiently and maintaining a price structure which reflects numerous significant departures from norms of competitive pricing.[20]

These sectors will be analyzed individually later in this study. It may be helpful, however, to introduce at this stage some of the theoretical reasons behind the implication that noncompetitive behavior can lead to higher medical prices. As Hicks has indicated, firms which have some influence over the prices at which they sell are, to some extent, monopolistic.[21]

Situations giving rise to influence on prices and, hence, monopoly include lack of substitutes, collusion among producers, institutional actions and devices such as barriers to entry, and economies of scale. The last situation is more properly a result of bigness rather than some inherent badness of monopoly. It often leads to the creation of a natural monopoly and probably regulation to ensure that the public benefits from

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[19]U.S., Congress, Senate, Subcommittee on Anti-trust and Monopoly of the Committee on the Judiciary, Hearings, Administered Prices in the Drug Industry, 86th and 87th Cong., 1960-61.

[20]The literature on this subject is substantial. Examples are: Walter E. Landgraf, "Needed: New Perspective on Health Services," Harvard Business Review (September-October, 1967), pp. 75-83; H. E. Klarman, "The Increased Cost of Medical Care," in The Economics of Health and Medical Care, pp. 244-245; Herman M. Somers and Anne R. Somers, Medicare and Hospitals, Issues and Prospects, Studies in Social Economics (Washington: The Brookings Institution, 1967), p. 233 et seq.; Kong Kyun Ro, "Incremental Pricing Would Increase Efficiency in Hospitals," Inquiry, VI (March, 1969), 28-36.

[21]J. R. Hicks, Value and Capital (2nd ed.; Oxford: Clarendon Press, 1946), p. 83.

the firm's ability to supply the market at a lower average cost than could several competitors.

Partial monopoly of an industry whereby some, but not all, of the conditions or consequences of monopoly exist is, with natural monopolies excepted, said to be inferior to competition because it leads to higher prices and lower outputs.

In competition, consumers have access to market information, products are relatively homogeneous, and prices are controlled by the forces of supply and demand. Consumers are less well informed in purchasing medical services and producers are able to set prices and discriminate among consumers. Particularly in the medical professions, where price competition and advertising are stigmatized as unethical means of attracting additional customers, producers are selected according to necessity or subjective criteria. Once the selection is made the consumer is rarely able to bargain on price, additional services to be purchased, or to whom referral will be made for additional services. Furthermore, medical services lack the homogeneity of competitively produced services. Each demand for medical care is individually treated with the result that differences in the quality and quantity of services provided are commonplace.

In competition there is relative ease of entry into an industry. The medical industry has erected barriers to entry into some of the professions and the hospital business. It has been charged that these barriers operate nationally through the educational process, at the state level through licensing procedures, and at the local level through medical societies and hospital staffs.[22]

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[22]D. R. Hyde et al., "The American Medical Association: Power, Purpose and Politics in Organized Medicine," Yale Law Journal, LXIII (May, 1954), 938-1022.

Economic theory suggests that the consumer bases his purchasing decisions on rational criteria that enable him to maximize utility. By implication, medical services are just another item in the consumer's market basket. Under most circumstances a consumer may or may not purchase medical services. Were he to enter the market in a setting where resources were allocated efficiently, there would be reason for encouraging producers to act in their own best interests, safe in the knowledge that consumer satisfaction is being achieved.

If it is true, however, that there is a lack of competition in medical production, it is hard to conclude that consumers benefit when producers act in their own self interest. Services may not be purchased if consumers lack knowledge or income, or feel that the price is too high. Furthermore, some services may not even be offered if producers do not envisage a profitable market for them.

It is evident, therefore, that medical producers are in a strong bargaining position relative to consumers. Because of this relationship producers have not been fully subjected to competitive pressures to increase the efficiency of their operation. Furthermore, as demand for medical care has increased over the years, and though there have been substantial productivity increases in some areas, it has been relatively easy for producers to adjust by increasing prices. It does not seem unreasonable to conclude with Baily, that, under a more competitive structure the incentive to increase productivity would have been greater than it has, and that had this happened prices would have risen less than they have and a greater volume of medical services would have been available to consumers.[23]

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[23]Richard M. Baily, "An Economist's View of the Health Services Industry," Inquiry, VI (March, 1969), 3-18.

Proposals are frequently being made whose purpose, whether stated explicitly or implicitly, is to lower the price of medical services. Suggested methods can usually be reduced to three broad criteria: increasing the supply of services, increasing the productivity of present services, and regulating prices.[24] To some extent efforts are being made to apply all these methods. There are movements towards increasing the supply of health personnel both at the professional and sub-professional levels. Productivity gains have resulted from new methods of treatment and reorganization of health facilities. Recent statements from the U.S. Department of Health, Education, and Welfare indicate that some controls are being applied with respect to fees charged for publicly insured medical services. But these are only beginnings. Noticeable differences in the medical market will not become evident until some major policy decisions are made which will have far-reaching implications with respect to changing the health care delivery system. A full analysis of the decisions that have to be made, if indeed the medical systems does need changing, is beyond the scope of this paper.[25] What is intended here is to examine four sectors of the industry as they relate to the Grand Traverse Region's medical economy: to ascertain whether or not they act non-competitively, to determine whether or not they are able to translate their actions into excessive earnings, and to obtain estimates of such earnings if they occur. In doing this the real objective is to determine the extent to which the industry itself contributes to imperfections in

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[24] See such studies as: Report of the National Advisory Commission on Health Manpower, I and II; and U.S. Department of Health, Education, and Welfare, Report of the National Conference on Medical Costs.

[25] Note: The interested reader may read a scathing indictment of some sectors of the medical industry in U.S., Congress, Senate, Committee on Finance, Report of the Staff, Medicare and Medicaid, Problems, Issues, and Alternatives, 91st Cong., 1st Sess., February 9, 1970.

the health delivery system. Excessive profits, where they are found, would suggest that output is probably less and prices are probably higher than they would be in the absence of the factors giving rise to excessive profits. As a result, some consumers' needs are not met, but their real needs, assuming no subsidies and a fixed demand curve, could be transformed into effective demand through increases in the supply of medical services.

The analysis of excess earnings is concerned with four sectors: physicians, the drug industry, the medical equipment industry, and hospitals. The first three are hypothesized to act monopolistically and thereby earn excessive profits. The hospitals of concern in this study are the region's general hospitals. As nonprofit institutions they cannot be charged with earning excessive profits. They may, however, be subject to organizational deficiencies or operational inefficiencies so that average costs and, therefore, charges are higher than they would be were the deficiencies eliminated.

Excess profits that are of concern here fall into two categories, those earned from professional practice by physicians and those earned from manufacturing and retailing by the drug and medical equipment industries. Consequently, while the basic definition of excess profits is similar in each case, the approach used to identify profits will differ.

In theory, given the demand curve and the cost structure of the industry, prices are higher and profit margins wider under monopoly than under competition. If total costs are defined to include normal profit, revenue-cost ratios would have a minimum value of one for competitive industries and reach an upper bound in monopoly. Excess profits, therefore, are returns greater than all costs, and firms or industries with a high degree of monopoly power will tend to earn higher profit rates than

others. This excess rate should be persistently higher among industries with a relatively greater degree of monopoly power than others, so long as the average relationship of industry demand to cost and conditions of entry are stable.[26] The purely competitive condition, whereby the ratio of total revenue to total cost approaches unity, is a rare phenomenon in American industry. It would therefore, be unrealistic to use the competitive ideal as the yardstick against which to measure excess profits. A more reasonable approach is to use rates of returns in other industries as the yardstick. Were resources relatively free to move among industries, resources would move from the relatively low profit industries to those with higher profits. In the long run these movements would be reflected in adjustments towards greater equality among industries.

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[26]Bain, Quarterly Journal of Economics, LXV, 295.

CHAPTER III

THE GRAND TRAVERSE REGION

Physical Setting

The Grand Traverse Region upon which this analysis is based is composed of eight counties in the northwestern part of Michigan's lower peninsula. The counties are: Antrim, Benzie, Crawford, Grand Traverse, Kalkaska, Leelanau, Missaukee, and Wexford (see Figures 2 and 3).

The region forms the larger part of the Northwest Michigan Economic Development District. In addition to the eight counties, the Development District includes Emmet, Charlevoix, and Manistee Counties. The eleven counties are linked not only by geographic proximity but also by common history, economic problems, and an economic future.

Water and related resources are important natural assets of the region. Along with a large expanse of Lake Michigan shoreline, the region possesses many inland lakes and streams. Other natural resources include thousands of acres of pine and hardwood forests that abound with wildlife; large stretches of clean fine sand; and deposits of gravel, limestone, and salt.

These natural resources are enhanced by favorable physical features. The region is composed of glaciated land with high rolling hills, and broad valleys and plateaus that provide attractive views. The climate is tempered by the lakes and is marked chiefly by warm, comfortable summers and cold, snowy winters.

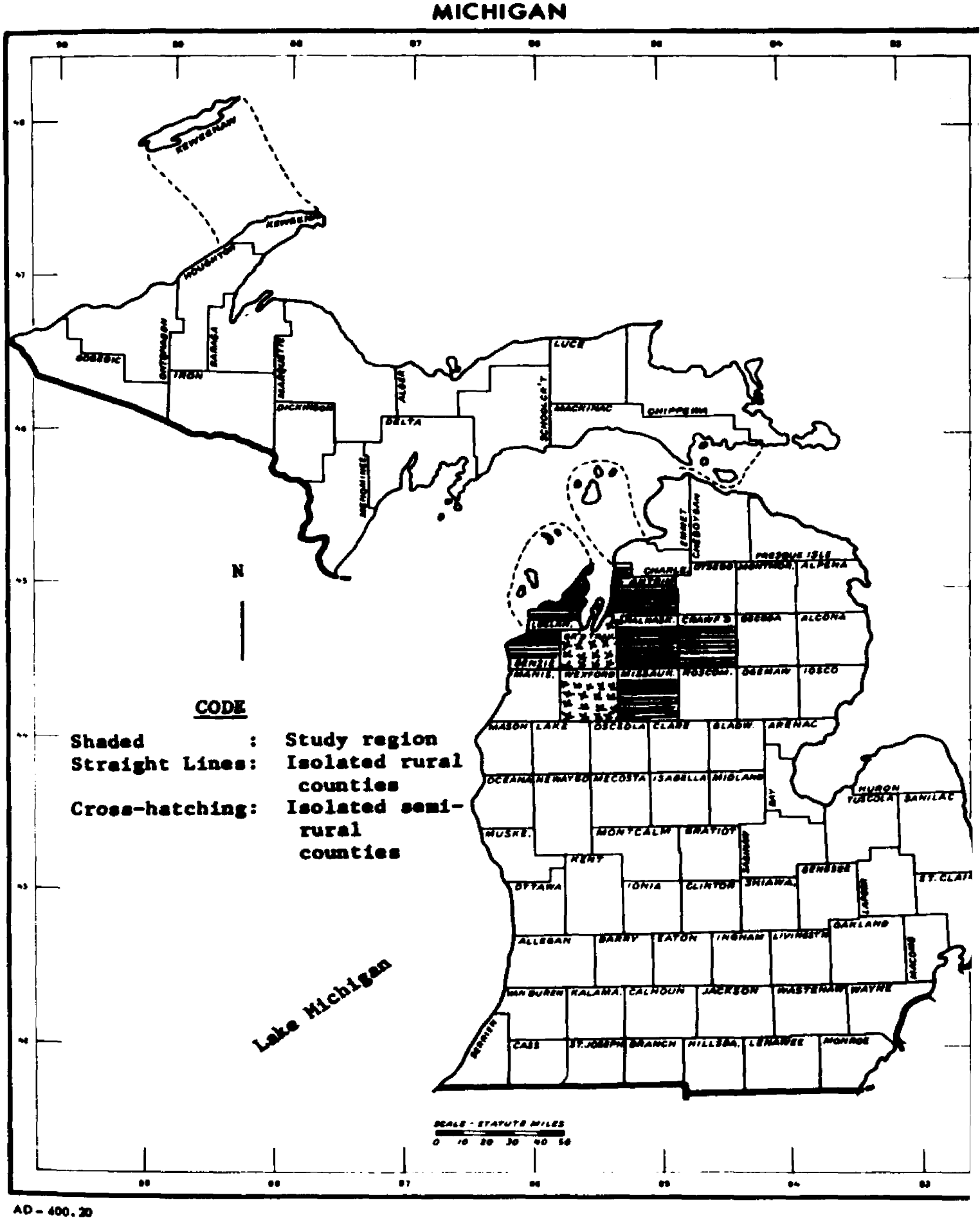

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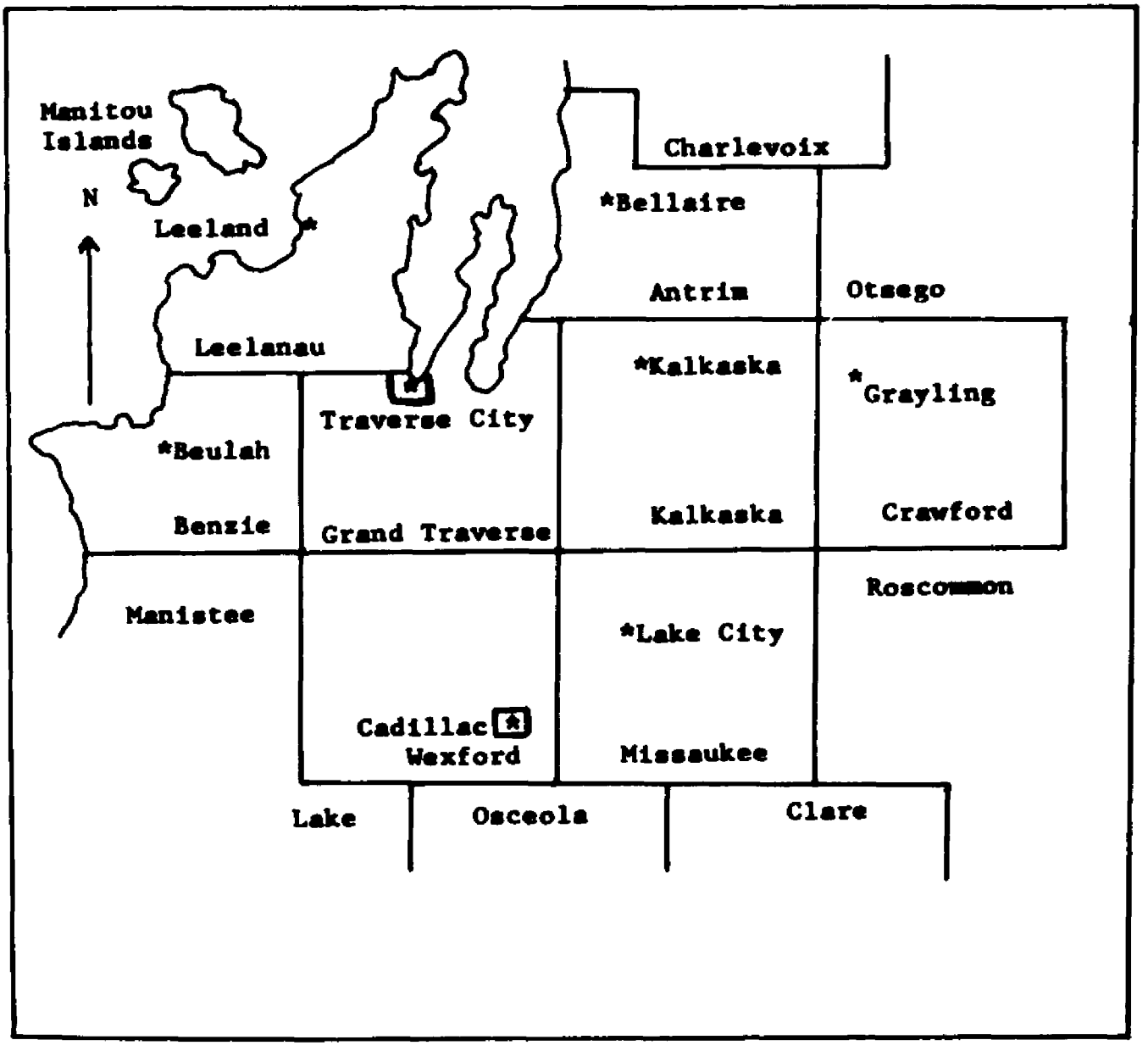
FIGURE 2.--Michigan and the Grand Traverse Region



KEY

* County Seats
Cities with 3,000 or more population

FIGURE 3.--The Grand Traverse Region

As a result of these geographical characteristics the region has evolved as a vacationers' paradise, and one of the largest industries is the production of leisure services. Activities include touring, boating, fishing, swimming, camping, hiking, hunting, skiing, and snowmobiling.

There are two large towns in the region: Traverse City and Cadillac. Cadillac has a population in excess of 6,000 people and Traverse City has approximately 20,000 people. All other towns in the region have populations of less than 3,000. These smaller places serve primarily as shopping centers for local inhabitants and tourists.

Income

Family incomes are indicative of a population's ability to support itself within an existing economic structure. Comparisons of family incomes in the region with family incomes in all of Michigan and the United States (Table 8) show that in 1967 the region had a higher proportion of its population with incomes under $3,000 per annum. The rates were 27.9 percent, 15.2 percent, and 21.5 percent, respectively, for the region, the state, and the nation. The same relative pattern held for families with incomes between $3,000 and $5,000 per annum. In the higher income ranges the proportion of regional families drops below the state and national levels.

Individually, none of the counties is as well off in terms of family income as the state, and only Grand Traverse County has an average family income greater than the nation's. Cost of living data for the region are unavailable. Local people believe, however, that especially during the tourist season, the cost of living is higher than in other parts of Michigan.[1]

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[1]Conversation with Mr. Hal Van Sumeren, Assistant Manager, Traverse City Area, Chamber of Commerce, August, 1968.

TABLE 8.--Effective buying income and percentage distribution by households, 1967

Area	Effective buying income		Distribution of household income groups				
	Per capita	Per household	$0 $2,999	$3,000 $4,999	$5,000 $7,999	$8,000 $9,999	$10,000 and over
	Dollars		Percent				
Michigan.	2,839	9,885	15.2	11.1	27.8	16.9	29.0
United States . . .	2,543	8,532	21.5	15.4	28.1	13.5	21.5
Region.	2,009	6,858	27.9	19.0	29.5	10.6	12.7
County:							
Antrim.	1,871	6,237	30.8	21.1	29.2	8.7	10.2
Benzie.	2,034	6,426	25.7	17.9	33.0	11.1	12.3
Crawford.	1,948	7,014	27.3	19.0	32.2	10.7	10.8
Grand Traverse. .	2,449	8,971	23.1	13.9	30.0	14.1	18.9
Kalkaska.	1,836	6,032	30.6	21.7	27.0	10.7	10.0
Leelanau.	2,015	6,672	29.2	20.5	28.9	8.8	12.6
Missaukee	1,770	6,196	32.6	22.4	25.3	8.4	11.3
Wexford	2,150	7,318	24.6	15.9	31.0	12.8	15.7

Source: "Northwest Michigan Economic Development District--Overall Economic Development Program," prepared by the Northwest Michigan Economic Development District for the Economic Development Administration, U.S. Department of Commerce, Washington, D.C., July 1, 1968, unpublished draft copy.

Demography

Demographic information often provides useful insights into the economic standing of a region. During 1960-67, the Grand Traverse Region had a population growth rate below that of Michigan and the nation (Table 9). Grand Traverse and Crawford Counties grew faster than the state, but the other six counties grew sufficiently slowly or negatively, so that the overall average went down.

Migration is a useful indicator of population stability. An economically stable area provides sufficient employment to cover employment needs generated by the natural increase in population. If employment expands at the same rate as population, then one of the incentives for migrating is removed. The region had a net out-migration of 9.4 percent in the decade 1950-60 (Table 10). This is typical of rural areas where per capita incomes are relatively low. In the 1960's, however, the rate fell to 1.7 percent. Only Grand Traverse and Kalkaska showed a net in-migration in this decade, but all of the counties except Missaukee showed an improvement over the earlier period. Nevertheless, people are still leaving the region to find employment elsewhere. Since most of the migrants are young people, the pattern of net out-migration represents a cost to the region in terms of its investment in education that is unlikely to be recouped unless other young people move in.[2]

The population's age distribution is indicative of the fact that people of the most productive ages have been leaving the region. The proportion of the population aged 25-44 is about 4.4 percent lower than state and about 3.4 percent lower than national averages; the region's

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[2]"Northwest Michigan Economic Development District--Overall Economic Development Program," prepared by the Northwest Michigan Economic Development District for the Economic Development Administration, U.S. Department of Commerce, Washington, D.C., July 1, 1968, unpublished draft copy, p. 13.

TABLE 9.--Population trends, Michigan, the U.S., and the Grand Traverse Region, 1950-67

Area	Population			Average annual absolute change		Average annual percentage change	
	1950	1960	1967	1950-60	1960-67	1950-60	1960-67
	Mil.	Mil.	Mil.	Mil.	Mil.	Pct.	Pct.
Michigan.	6,372	7,823	8,199	0.15	0.54	2.3	4.8
United States	151,326	179,323	193,818	2.8	2.9	1.85	0.81
	No.	No.	No.	No.	No.	Pct.	Pct.
Region.	90,506	95,621	97,500	512.0	268.0	0.57	0.20
County:							
Antrim.	10,721	10,373	9,000	-34.8	-19.6	-0.32	-1.30
Benzie.	8,306	7,834	7,900	-47.2	9.4	-0.57	0.10
Crawford.	4,151	4,971	5,400	82.0	53.6	1.98	0.90
Grand Traverse. . .	28,598	33,490	37,000	498.2	501.4	1.71	1.05
Kalkaska.	4,597	4,382	4,600	-21.5	31.1	-0.47	0.50
Leelanau.	8,047	9,321	9,600	127.4	39.9	1.58	0.30
Missaukee	7,458	6,784	6,300	-67.4	-69.1	-0.90	-0.71
Wexford	18,628	18,466	17,700	-16.2	109.4	-0.09	-0.41

Source: "Northwest Michigan Economic Development District--Overall Economic Development Program," prepared by the Northwest Michigan Economic Development District for the Economic Development Administration, U.S. Department of Commerce, Washington, D.C., July 1, 1968, unpublished draft copy, p. 26.

TABLE 10.--Rates of migration for the Grand Traverse Region, 1950-60, 1960-66

County	Rate of migration	
	1950-60	1960-66
	Percent	Percent
Antrim	-12.0	-1.8
Benzie	-15.0	-4.0
Crawford	5.3	-1.4
Grand Traverse	0.6	1.0
Kalkaska	-12.6	7.6
Leelanau	-6.4	-5.2
Missaukee	-7.1	-7.2
Wexford	-14.1	-2.8
Region	-9.4	-1.7

Source: "Northwest Michigan Economic Development District--Overall Economic Development Program," prepared by the Northwest Michigan Economic Development District for the Economic Development Administration, U.S. Department of Commerce, Washington, D.C., July 1, 1968, unpublished draft copy, pp. 26 and 27.

population 65 and over is higher than state and national proportions by almost the same percentages. All eight counties have an age distribution that is high in retired people and low in productive workers when compared with age distributions in Michigan and the nation; yet children in the 0-16 age group comprise about the same proportion of the population in the region as the state and nation.[3] In effect then, the region has a typical rural problem of an insufficient work force to support its older and younger population groups.

Employment

The decline in the population in the productive age bracket, the seasonal nature of the labor market, and the employment of many people at or below minimum wage levels are symptoms of a labor problem which has plagued the region ever since the timber industry declined at the end of the last century.

The problem is emphasized by the region's persistently high and growing rate of unemployment (Table 11). In 1950, 5.5 percent of the labor force were unemployed; by 1967 unemployment had risen to 7.8 percent. This high rate may seem surprising for a region that is acknowledged for its bountiful agricultural industry and rapidly growing tourist trade. The explanation lies in the seasonal variation, the size of the work force, the number of unemployed, and the rate of unemployment. Table 12 shows, rather startlingly, how dependence on seasonal industries can lead to a large number of unemployed for much of the year, with the result that the annual rate of unemployment is also high. Of the top four sources of employment in the region--manufacturing, wholesale and retail trade, services, and agricultural--all but the first are

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[3] Ibid., p. 14.

TABLE 11.--Average annual rates of unemployment in the Grand Traverse Region, 1950-1967

Area	Rate of unemployment		
	1950	1960	1967
	Percent	Percent	Percent
County:			
Antrim	4.9	10.3	6.1
Benzie	5.4	8.9	11.2
Crawford	8.5	7.5	6.7
Grand Traverse, Kalkaska, and Leelanau	5.9	8.8	6.9
Missaukee	2.7	4.0	(a)
Wexford	5.7	6.5	8.1[b]
Region	5.5	7.7	7.8

[a]Included in Wexford.

[b]Includes Missaukee and Osceola, a nonregional county.

Source: "Northwest Michigan Economic Development District--Overall Economic Development Program," prepared by the Northwest Michigan Economic Development District for the Economic Development Administration, U.S. Department of Commerce, Washington, D.C., July 1, 1968, unpublished draft copy, p. 31.

TABLE 12.--Seasonal patterns of employment and unemployment in the Grand Traverse Region, 1967[a]

Month	Size of work force	Number of unemployed	Percentage of work force unemployed
	Number	Number	Percent
February.	39,050	3,550	9.1
April	39,525	3,750	9.5
June.	42,075	3,650	8.7
August.	43,525	2,700	6.2
October	40,450	1,975	4.9
December.	39,775	2,850	7.2

[a]These figures exclude Crawford County and include Osceola County.

Source: "Northwest Michigan Economic Development District--Overall Economic Development Program," prepared by the Northwest Michigan Economic Development District for the Economic Development Administration, U.S. Department of Commerce, Washington, D.C., July 1, 1968, unpublished draft copy, p. 40.

responsive to the seasonal activity of tourists and harvests.

Besides suffering a reduction in income due to seasonal employment, workers in the region tend to work on a pay scale that is lower than for workers in corresponding trades in Michigan.[4] Consequently, even though there are good bases for steady employment, many workers earn smaller returns than are received elsewhere for a comparable investment. Furthermore, it is inevitable that some of the people are without work for at least part of the year.

The severe effect of these conditions was implied in Table 8, which showed that 27.9 percent of the Grand Traverse Region households had incomes of less than $3,000 in 1967, compared with 15.2 and 21.5 percent for the state and nation, respectively.

Unemployment information suggests that there are too few jobs to employ the entire work force of the region at any time. Yet, paradoxically, employers report that there are plenty of available jobs, and that they often want employees and cannot get them. Some of the explanations for this situation are: (1) required skills are beyond the capacity of the unemployed, (2) salaries are too low to entice the unemployed, (3) communication between employers and potential employees is inadequate, or (4) the unemployed prefer not to work.[5]

Summary

The Grand Traverse Region's economic viability rests primarily on its ability to make full use of its natural resources and to attract more industry. The physical setting creates advantages for agriculture and tourism. These seasonal industries have the capacity for greater

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[4] Ibid., p. 19.

[5] Ibid., p. 21, et seq.

development, but there is also a need to attract other, year-round industries.

Although Traverse City and Cadillac are potentially attractive for industrial development, neither community is large enough or financially strong enough to create new industries unaided. Thus, it seems likely that any major expansion would be heavily dependent on the investment of outside capital.

Services are major sources of employment. Often, in small area studies, services are either conglomerated or at best separated into governmental and nongovernmental sectors. Part of the purpose of this study is to isolate one service sector, the medical sector, and in so doing, to develop a method for analyzing it as an individual component of a region's overall economic structure. Beyond some work on the relationship between health and human productivity, little attention has been paid to the medical field in a developmental context. This may be because the sector is usually an insubstantial element in a region's economy and also because of the scarcity and inadequacy of medical data. An attempt will be made in the next few chapters to show how the medical sector can be isolated and the data problem managed by integrating local and national sources.

CHAPTER IV

THE GRAND TRAVERSE REGION'S MEDICAL SECTOR

It will be helpful to think in terms of a medical sector. That is, a sector of the local economy composed of a complex of public and private firms, institutions, and individuals whose primary function is furnishing medical, surgical, and other health services to people, either directly or indirectly.

Every multicounty region has a medical sector. Its complexity and size are likely to vary with the physical and economic characteristics of the region in question. A few regions contain all, but most contain some of the following components: hospitals; nursing homes; medical and dental laboratories; offices and other establishments providing the services of physicians, dentists, optometrists, and others; publicly operated offices, clinics, and laboratories; retailers of drugs and health sundries, prosthetic appliances, eyeglasses, and medical equipment; financial intermediaries such as insurance offices; and manufacturers and distributors of medical supplies.

The full complement of these components is rarely found outside large, industrial urban centers. Nevertheless, inasmuch as the residents of a particular region purchase the products and services of any component, that component exerts some economic influence on the region.

The emphasis of this study is on the economic structure of the medical sector in the Grand Traverse Region. At the same time it is desired to develop an analytical framework for use in other regions. Thus,

there is need for a structural classification that will be amenable to both goals. A useful start can be made by adopting a classification, developed by the U.S. Department of Health, Education, and Welfare, which forms the framework for national health expenditure estimates. HEW's format and estimates for the nation for 1967 are shown in Table 13.

The first major objective of this study is to relate parts of the table to the Grand Traverse Region. This will give a framework within which to express the structure and income of the region's medical sector and a base from which to branch off to prepare the analysis of excess expenditures.

All Medical Facilities

Working in cooperation with the U.S. Public Health Service, the Michigan Department of Public Health has delineated the state according to hospital service areas. The areas are based on trade patterns, and take into account population distribution, transportation and trade patterns, travel distance, and information about the residence of patients using an area's hospitals. Boundaries of each area are drawn so that no person in Michigan is more than 30 minutes traveling time from an acute care hospital. There is at least one general hospital in each area. It serves as the primary health care facility for the area's population. With patient referral patterns as the base, service areas are grouped to form regional areas. These areas have a medical center hospital which serves as the referral hospital for the other general hospitals in the region.

To be a regional medical center, a hospital must have more than 100 beds, a teaching program for interns and nurses, staff members with training in major specialities, and a pattern of referral for patients from adjacent areas.

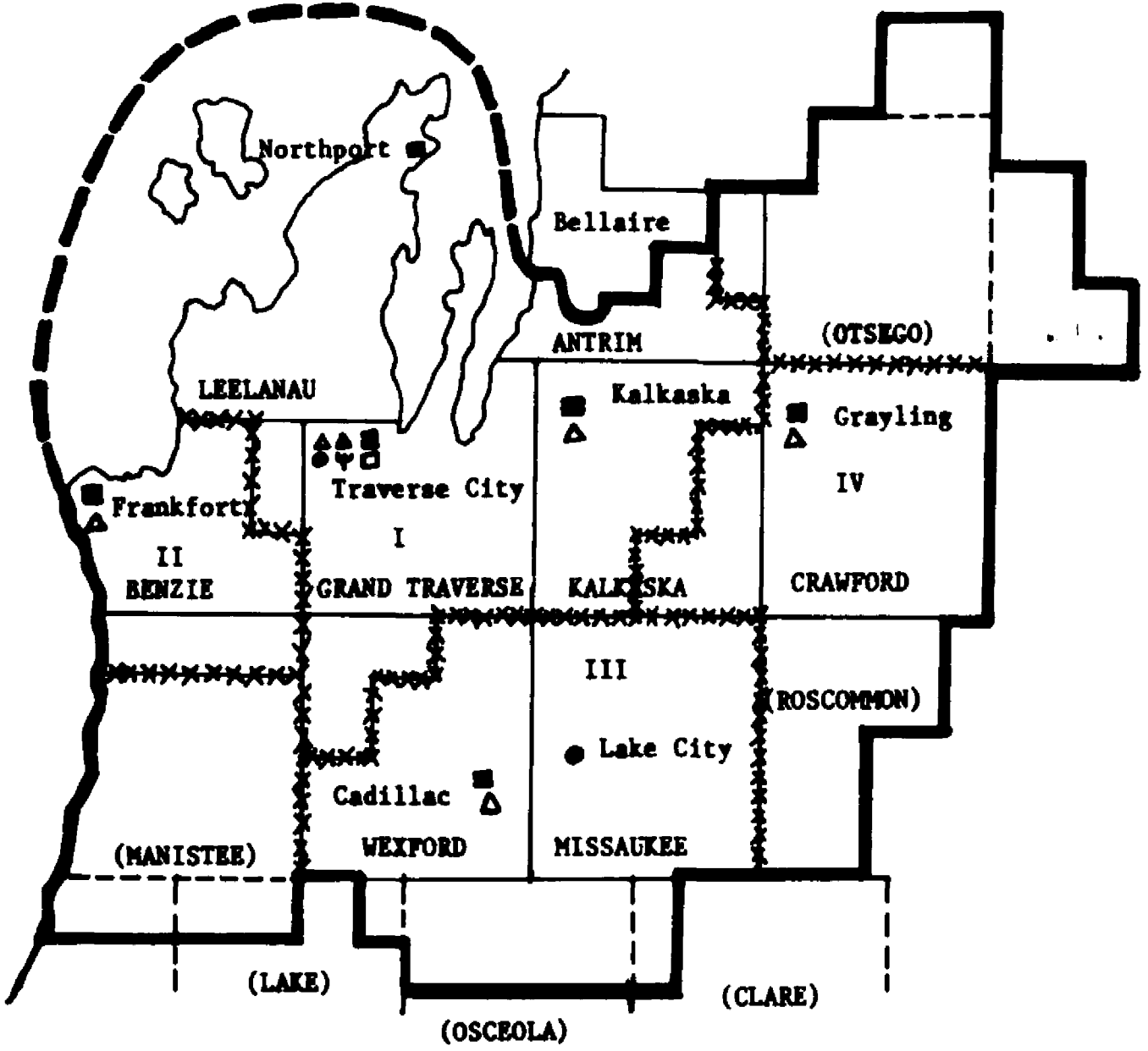
TABLE 13.--National health expenditures, by type of expenditure and source of funds, 1967

Type of expenditure	Total	Source of funds						
		Private				Public		
		Total	Consumers	Philanthropy	Other	Total	Federal	State and local
	Million dollars							
Total	50,655	32,833	30,417	1,467	949	17,822	11,825	5,999
Health services & supplies	46,885	31,497	30,417	710	370	15,388	9,863	5,527
Hospital care	17,946	9,092	8,752	340	--	8,854	5,549	3,306
Federal services	1,877	177	177	--	--	1,700	1,677	23
State & local facilities	5,054	1,728	1,728	--	--	3,325	634	2,691
Nongovernmental facilities	11,016	7,187	6,847	340	--	3,829	3,238	591
Physicians' services	10,163	8,201	8,191	10	--	1,962	1,375	587
Dentists' services	3,186	3,063	3,063	--	--	124	68	55
Other professional services	1,447	1,348	1,323	25	--	98	60	39
Drugs and drug sundries	5,569	5,337	5,337	--	--	232	120	112
Eyeglasses & appliances	1,584	1,545	1,545	--	--	39	19	20
Nursing-home care	1,858	666	646	20	--	1,192	775	418
Expenses for prepayment and administration	1,777	1,560	1,560	--	--	217	217	--
Government public health activities	914	--	--	--	--	914	268	646
Other health services	2,441	685	--	315	370	1,756	1,412	344
Research and medical facilities construction	3,770	1,336	--	757	579	2,434	1,962	472
Research	1,775	178	--	178	--	1,597	1,530	67
Construction	1,995	1,158	--	579	579	837	432	405
Publicly owned facilities	628	--	--	--	--	628	235	393
Privately owned facilities	1,367	1,158	--	579	579	209	197	12

Source: U.S. Department of Health, Education, and Welfare, Social Security Administration, Social Security Bulletin (January, 1969), p. 4.

Traverse City has one of the 14 regional medical centers in Michigan--the James Decker Munson Memorial Hospital. The Traverse City Hospital Region includes the service area of Traverse City and four other service areas, all of which have small acute general hospitals. The Traverse City Hospital Region, with Munson Hospital as the regional medical center, serves all of eight counties and parts of several others. Of the eight counties totally served, seven--Benzie, Crawford, Grand Traverse, Kalkaska, Leelanau, Missaukee, and Wexford--are in the Grand Traverse Region, the focal point of this study. Parts of Antrim County are served; other counties served by the Traverse City Hospital Region, but outside the region of this study, are Manistee, Mason, Lake, Osceola, Clare, Roscommon, and Otsego. The boundaries of the hospital region are shown in Figure 4.

Traverse City, the regional center for specialized services, has practically all the major medical specialities represented on the staffs of its hospitals. Location of a State Mental Hospital in Traverse City makes it the focal point for mental health services in the northwest portion of the lower peninsula. In addition to Munson Hospital and the State Hospital, there are an osteopathic hospital and two long-term facilities. One of these, the Grand Traverse County Medical Care Facility, is constructed adjacent to Munson Hospital, which provides dietary, laboratory, pharmacy, laundry, and boiler plant services to the County Facility. Other general hospitals in the study region are located in Leelanau, Kalkaska, Wexford, Benzie, and Crawford Counties. With the exception of the 128-bed Mercy Hospital in Cadillac, in Wexford County, these hospitals are relatively small and are, essentially, community oriented. Long-term facilities are located in Antrim, Benzie, Kalkaska, and Wexford Counties in addition to Grand Traverse County. Tuberculosis



Key

▬ = Traverse City Hospital Region

xxx = hospital service areas, denoted as:

I Traverse City
II Frankfort
III Cadillac
IV Grayling

Names of counties outside the study region are in parentheses.

△ Nursing Home
■ General Hospital
● Public Health Center
Ψ Psychiatric Hospital
□ Osteopathic Hospital

FIGURE 4.--Traverse City Hospital Region, hospital service areas, and location of facilities in the Grand Traverse Region

in-patient needs are provided mainly by TB hospitals in Saginaw and Grand Rapids, both of which are outside the region. Public health services are located throughout the region on a district basis. Leelanau, Grand Traverse, and Benzie Counties are served by a health department with central offices in the Grand Traverse Medical Care Facility in Traverse City. Crawford, Kalkaska, Missaukee, and Wexford Counties form another public health district; its central office is in Lake City, Missaukee. Antrim is included in a four-county district with its central office in Charlevoix, Charlevoix County.

This section can be summarized by noting that the Grand Traverse Region is served by a complex and complete set of major medical facilities. Location of these facilities is shown in Figure 4 and data on the region's hospitals and nursing homes is presented in Table 14.

General Hospitals

A widely used indicator of the adequacy of a region's medical facilities is the population-to-general hospital bed ratio. A limitation on this approach is its exclusion of admissions from outside a region, and the use by a region's population of facilities elsewhere. A study of the hospital needs in the Grand Traverse Region indicated that the region's population relies almost 100 percent on local facilities, but that there are also many admissions from outside the region. Most of these nonregional patients are attracted by Traverse City's reputation as a center for high quality medical care, but many are also drawn from the tourist and migrant worker populations. While similar patterns may well be observable in other rural regions, it seems reasonable to expect that the Grand Traverse Region would, because of its special medical and environmental characteristics, have a relatively low regional population-

TABLE 14.--The Grand Traverse Region's hospitals and nursing homes, 1967

County	Facility	Number of facilities	Number of beds	Patient days
		Number		Days
Antrim.	Nursing home	1	58	25,162
Benzie.	General hospital	1	43	12,342
	Nursing home	1	42	9,373
Crawford.	General hospital	1	68	20,561
Grand Traverse	General hospital	1	250	73,730
	State hospital	1	2,825	934,856
	Osteopathic hosp.	1	73	22,643
	Nursing home	2	154	53,643
Kalkaska.	General hospital	1	20	4,259
	Nursing home	1	12	3,650
Leelanau.	General hospital	1	29	6,995
Missaukee	None	--	--	--
Wexford	General hospital	1	128	37,946
	Nursing home	2	87	24,111
Total		15	3,789	1,229,271

Sources: Michigan State Plan for Hospital and Medical Facilities Construction 1968-69 (Lansing, Michigan: Michigan Department of Public Health, 1969); Hospitals, Journal of the American Hospital Association, XLII (August, 1968).

to-bed ratio. As Table 15 shows, this is the case. The region has a lower population-bed ratio than any other county group in the nation. While there are limitations to the approach, it is indicative of a relatively adequate standard of hospital facilities.

Reference has been made to Traverse City's reputation as a center for high quality care. Some of the factors assisting this are: (1) the osteopathic and the general hospital are accredited by their respective accrediting bodies;[1] (2) the relatively recent construction or remodeling of the hospitals, which means, for the most part, that they are able to offer up-to-date treatment facilities; and (3) there is a high proportion of specialists on the hospital staffs.

Considerable space has been devoted to the region's hospital system. The reason is that a region's hospitals form the core of its health care delivery system, and as may have been gathered from Table 13, they are the major economic force of its medical sector.

Professional Services

Professional medical services have been becoming increasingly specialized and concentrated in urban and high income areas. This nationwide pattern is evidently true of the eight-county Grand Traverse Region. Professionals are concentrated in the two relatively urban counties, Grand Traverse and Wexford (Table 16). Also, the region's major medical facilities are located in Traverse City, and to a lesser extent, in Cadillac in Wexford County.

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[1]This also applies to other hospitals in the region, except the Kalkaska Memorial Hospital. Hospitals, Journal of the American Hospital Association, XLIII (August, 1969), 112.

TALBE 15.--Population per general hospital bed for the United States, county groups, and the Grand Traverse Region, 1966[a]

Area	Population per hospital bed
United States.	263
County groups:	
1.	249
2.	249
3.	309
4.	243
5.	479
Grand Traverse Region.	192

[a]The county grouping is discussed on page 8.

Source: American Medical Association, The Distribution of Physicians, Hospitals, and Hospital Beds in the United States, 1966 (Chicago: American Medical Association, 1967).

TABLE 16.--Number of medical professionals in the Grand Traverse Region, 1967

Area	Active physicians (M.D.'s) in patient care[a]				Active dentists[b]	Active osteopaths[c]	Active registered nurses[d]
	Total	General practitioners	Specialists	Hospital-based			
Isolated rural counties:							
Antrim.	4	4	-	-	3	5	9
Benzie.	4	4	-	-	7	1	13
Crawford.	5	2	3	-	2	1	12
Kalkaska.	3	3	-	-	2	-	13
Leelanau.	4	4	-	-	4	-	25
Missaukee	2	2	-	-	1	-	7
Isolated semi-rural counties:							
Grand Traverse. . . .	90	13	37	40	27	17	191
Wexford	16	5	10	1	5	3	46
Region total. . . .	128	37	50	41	51	27	316

[a]Excludes Federal and retired physicians. American Medical Association, The Distribution of Physicians, Hospitals, and Hospital Beds, in the United States, 1967 (Chicago: American Medical Association, 1968).

[b]"Dentistry" (Lansing, Michigan: Michigan State Board of Education, May, 1967), unpublished mimeograph; American Dental Association, The Distribution of Dentists in the United States by State, Region, District and County, 1968 (Chicago: American Dental Association, 1969).

[c]Data are for 1966. American Osteopathic Association, Yearbook and Directory of Osteopathic Physicians, 1966 (Chicago: American Osteopathic Association, 1967).

[d]"Professional Nurses" (Lansing, Michigan: Michigan State Board of Education, February, 1967), unpublished mimeograph. Data based on 1964-65 Annual Report of the Michigan Board of Nursing (Lansing, Michigan: Michigan

Medical Doctors

The pull exerted by urban areas and their concomitant medical facilities is most pronounced in the location of specialists and hospital-based physicians. The intensity of the pull in the Grand Traverse Region can be roughly gauged from data in Table 17 regarding population-to-medical doctor ratios. As the data show, in 1967 the Grand Traverse Region had lower population-to-medical doctor ratios than did other rural areas, the United States as a whole, and, in some categories, urban areas. This is one indication that the region is well provided with specialists and hospital-based physicians.

The low ratios are almost exclusively attributable to Traverse City's influence. It should be noted that the city's medical hinterland does extend beyond the eight-county region. But so far as the eight counties are concerned, these are the relevant ratios. Furthermore they are the ratios commonly employed to effect rudimentary indices of health service sufficiency. Nevertheless, as the American Medical Association cautions, "The use of ratios alone does not constitute an adequate measure of the quantity or quality of health care received by the American public."[2] The Association points out that there is no nationally applicable or commonly accepted standard for evaluation of health care requirements. Most attempts that have been made to refine population-to-physician ratios do so by considering variables such as proportion of specialists, age of doctors, supporting services, and accessibility. Were such variables applied, the Grand Traverse Region could be expected to score at least as well and probably better than with the simple ratios used above.

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[2]American Medical Association, The Distribution of Physicians, Hospitals, and Hospital Beds in the United States, 1966 (Chicago: American Medical Association, 1967), p. 18.

TABLE 17.--Number of persons per nonfederal medical doctor, by region and type of practice, 1967

Type of practice	U.S.	County groups				
		1	2	3	4	5
General practice. .	3,047	2,959	3,562	2,844	2,810	2,842
Specialties	6,743	1,148	1,451	3,238	2,774	14,535
Hospital-based practice	3,471	2,006	3,812	13,478	10,325	87,211
All practices . .	802	586	812	1,361	1,230	2,314

	Grand Traverse and Wexford	Other six counties	Region
General practice. .	3,050	2,316	2,673
Specialties. . . .	1,168	14,667	1,978
Hospital-based practice	1,339	--	2,412
All practices . .	518	2,000	773

Source: American Medical Association, The Distribution of Physicians, Hospitals, and Hospital Beds in the United States, 1967 (Chicago: American Medical Association, 1968).

Dentists

In 1967, there were 1,714 people per dentist in the United States; the Michigan ratio was 1,899 people per dentist. The Grand Traverse Region ratio, 1,912 people per dentist, and those for the individual counties are shown in Table 18.

The distribution of dentists is important in relation to the availability of dental care. Dentists, like medical doctors, tend to locate where economic and cultural advantages are greatest, and there is generally a substantial divergence between urban and rural areas.

The range of population-to-dentist ratios is wide. But individual county ratios must be considered in a regional context and particularly in relation to the position of Grand Traverse County as a trade and medical center. Thus, although Missaukee County had only one dentist, it is reasonable to suppose that many patients used dentists in Grand Traverse and Benzie counties where there were, respectively, 1,370 and 1,141 people per dentist.

Osteopathic Physicians

The distribution of osteopathic physicians' services in the United States depends partially on legislation governing the practice of osteopathy in individual states, and partially on attitudes of patients towards osteopaths as qualified medical practitioners. Michigan osteopaths enjoy a favorable legal and social climate, thus they make an important addition to the supply of medical personnel. This is especially true in the Grand Traverse Region. Interviews with consumers and with medical personnel indicated that for many services, there is a high degree of substitutability between the use of osteopathic physicians and medical doctor[3]

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[3]These views were gained by the author during visits to the region.

TABLE 18.--Persons per active dentist, Grand Traverse Region, 1967

County	Population per dentist
Isolated rural counties:	
Antrim.	3,000
Benzie.	1,141
Crawford.	2,700
Kalkaska.	2,300
Leelanau.	2,400
Missaukee	6,300
Isolated semi-rural counties:	
Grand Traverse.	1,370
Wexford	3,540
Average for region.	1,912

Source: Tables 9 and 16.

There were 27 osteopathic physicians practicing in the Grand Traverse Region in 1967 (Table 16, page 55). The large proportion of osteopaths in the Grand Traverse Region can be attributed to Traverse City's role as the economic and medical center of the region, and associatively, with the presence of an osteopathic hospital in the city.

Professional Nurses

Table 16 shows that there were 316 registered professional nurses practicing in the region in 1967.[4] Seventy percent of the nurses in Michigan are employed in hospitals. Hence, the relative concentration of nurses in Grand Traverse County and, to a lesser extent, in Wexford County, is to be expected.

Estimates of desirable nurse-to-population ratios vary from a 1963 U.S. Surgeon General's figure of 350 nurses per 100,000 people to a 1964 Michigan survey figure of 327 nurses per 100,000 people.[5] According to the Michigan Board of Nursing there were, in 1964, only 238 nurses per 100,000 people in the state, and 319 per 100,000 in the Grand Traverse Region. The regional ratio is close to the desired state ratio, is significantly greater than the actual state ratio, and slightly greater than the actual national ratio of 306 per 100,000.[6]

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[4]Since this estimate is based on data in the 1964-65 Annual Report of the Michigan Board of Nursing, it may be low.

[5]U.S. Department of Health, Education, and Welfare, Health Resource Statistics, 1968, Public Health Service Publication No. 1509 (Washington: U.S. Government Printing Office, 1968), p. 138; and "Nursing Needs in Michigan" (Lansing, Michigan: Michigan Board of Nursing, 1967), unpublished mimeograph.

[6]U.S. Department of Health, Education, and Welfare, Toward Quality in Nursing: Needs and Goals, Report of the Surgeon General's Consultant Group on Nursing, Public Health Service Publication No. 992 (Washington: U.S. Government Printing Office, 1968); and "Nursing Needs in Michigan," 1967.

Assuming that these ratios have remained substantially unchanged, they provide a basis for concluding that the region is relatively well situated regarding its nursing needs even though the number of nurses may be less than optimum.

Summary

This concludes the survey of major medical facilities and professional health manpower located in the Grand Traverse Region. There are other facilities, such as laboratories, drug stores, and other medically-oriented retail stores and manufacturers, and other professionals such as chiropractors and sanitarians that are found in most areas, as indeed in this one. These facilities and professionals are mostly supportive of the major medical complex. Their variety and quantity can be related to the size and comprehensiveness of the complex, and the characteristics of the population it serves. Their importance to this study will be revealed in the following chapters in which their income will be estimated. A detailed description of the quantities of these auxiliary services would add little to the picture of the region's medical structure.

The region has been shown to be unusually well provided for in terms of the major medical services available to the population. The quantity and quality of medical services often greatly exceed the norm for rural areas in the United States, and in most cases, are closely comparable with standards found in well served urban areas. This is due, almost exclusively, to the exceptional medical complex that has been developed in Traverse City, and which has given the city a reputation as a focal point for the provision of high quality medical care.

Any comparative inferences that might be drawn from indications of the adequacy of medical facilities in the area are incidental to the

objectives of this study. The latter are concerned with whether the population is adequately served in terms of actual fulfillment of health service needs, and the comparison of the cost of providing unfulfilled needs with the excess income, if any, of the region's medical sector. Nevertheless, it should be noted that the region is an example of an isolated rural area that is excellently served in terms of available medical services. Were the region used as a standard by which to judge the adequacy of medical services in other isolated rural areas, it seems probable that most would be woefully lacking.[7]

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[7]Dr. Shyamalendu Sarkar's study, footnoted on p. 2 as the first study in a series of which the present study is a part, provides an excellent contrasting example of an inadequately serviced region.

CHAPTER V

INCOME AND EXPENDITURE ACCOUNTS--HOSPITALS

The primary objective of this and the following two chapters is to estimate medical spending and income in the Grand Traverse Region for the year 1967. This is to be accomplished in a way which will show the total dollar value of medical services produced in the region in the year; the distribution of this amount as income among the components of the medical sector; the sources from which it originates; the primary disposition of the income by the sector components; and, finally, the balance between external expenditures and externally originating income.

A guiding criterion in these chapters is that the method used shall be so developed that a similar method could be used in analyzing other multicounty regions. This will be accomplished by constructing a framework and set of accounts that are based mainly on nationally available secondary data, but which can be modified so as to accommodate primary data or special regional information when they are available.

Framework for Analysis

The market for a region's medical industry can, for the purposes of these chapters, be regarded as composed of three sectors: producers, consumers, and input suppliers. Producers are firms, institutions, and persons whose primary function is producing medical services for the consuming sector. The consuming sector is composed of institutions and people who pay the cost of maintaining the producing sector. The input supply sector is composed of firms and individuals that sell inputs to

the producing sector and not directly to consumers; this sector can also be thought of as the primary recipient of the income the producing sector spends.

The relationship among the three sectors is shown in Figure 5.

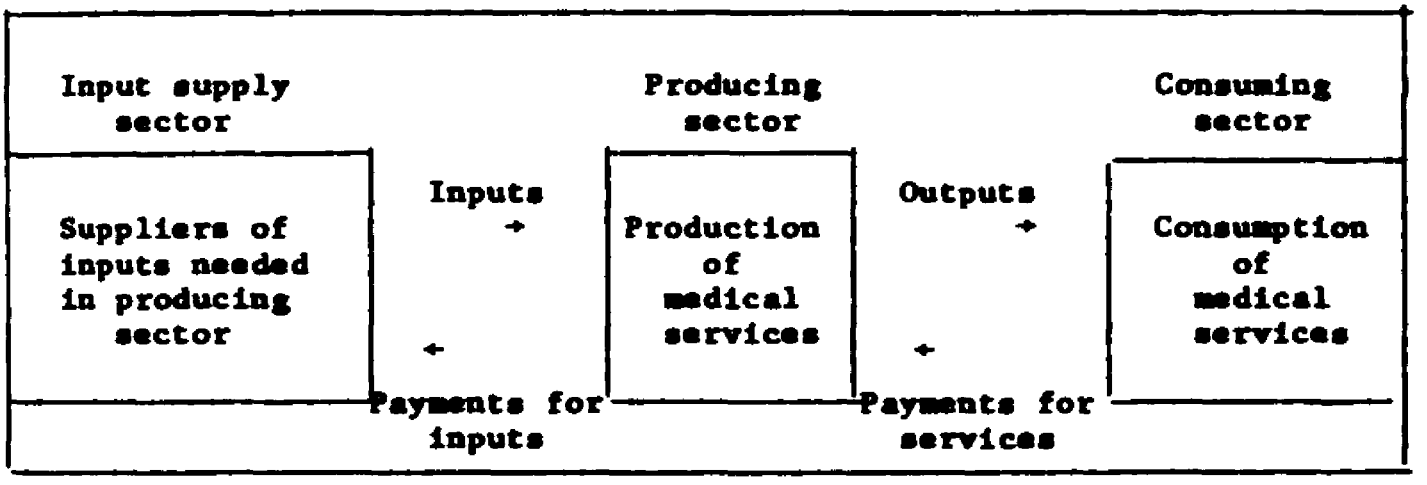

FIGURE 5.--Structure of the market for medical services

To show how the payments mechanism operates among the three sectors, it is necessary to decompose each into its components. The Department of Health, Education, and Welfare's method for distributing national health expenditures provides a starting point.[1]

Several advantages are to be gained from using HEW's breakdown. In the first place, it is an instantaneous source of estimates of per capita spending, so it can be used for approximations of regional spending when no better data are available. Secondly, it covers all health services; consequently, the only modifications that might be needed on the producing side are those which provide more detail about specific components. The same is true of the consuming sector; the various sources of funds are conveniently presented, and are amenable to modifications to suit regional analyses.

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[1]The distribution of total national health expenditures for 1967 is shown in Table 13, p. 48.

The type of modifications to be used will be ones that make the HEW breakdown relevant to the analysis in general. In the producing sector, physicians' services will be divided into services of medical doctors and osteopathic physicians. Federal hospital services, research, and medical facilities construction will not be used. There are no federal hospitals in the Grand Traverse Region, and research and construction expenditures are only incidentally relevant to a study of the cost of providing the received level of care in a given year.

In the consuming sector, state and local expenditures will be shown separately and private consumer expenditures will be divided into those originating within and without the region. These modifications will assist in the development of estimates of the value of medical services produced in the eight-county region and, inasmuch as some services are paid for by nonresidents, the value of medical services exports.

For the input supply sector, the analysis is more complicated because there exists no ready-made listing of how the productive components spend their income. Nevertheless, the main concern is to isolate three aspects of this expenditure: (1) the amount leaving the region, in effect, money spent on imports of medical supplies; (2) the amount spent on wages and salaries, and (3) so as to lay the groundwork for future chapters, the net incomes of medical doctors and drug and hospital equipment manufacturers.

The approach adopted is to take each producer individually and estimate its income and income distribution according to the type of consumer and region of origin. Only incidental attention is paid to the input supply sector during the income analysis; the distribution of incomes to the input sector is taken up separately in chapter seven. Finally, in chapter eight, the complete income-expenditure framework is

presented for the three sectors. Since the analysis is rather lengthy the remainder of this chapter will be devoted to the largest component of the health industry, the hospital. Chapter six will contain the analysis of the other producing components, and then the input sector and the summarizing framework will be presented in chapters seven and eight.

Hospitals

Hospitals of concern in this section are: the general hospitals in Benzie, Crawford, Grand Traverse, Kalkaska, Leelanau, and Wexford Counties, and the osteopathic and psychiatric hospitals in Grand Traverse City. By combining information from different sources it is possible to obtain detailed medical and economic data about most hospitals in the United States. Two major sources are Hospitals (the Journal of the American Hospital Association) and state plans for hospital and medical facilities construction.

Hospital Expenditures

Income and other data pertaining to the Grand Traverse Region's hospitals have been obtained from the above sources and are presented in Table 19.[2] Except for data on the osteopathic and Kalkaska hospitals on total expenditures, payroll expenditures, and number of personnel, the numbers in the table are as reported in the two sources. Unreported osteopathic and Kalkaska data were estimated according to the method outlined in Table 20.

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[2]Hospital incomes and expenditures are, unless otherwise noted, assumed equal. The assumption is based on the nonprofit orientation of the region's hospitals and the existence of only minor imbalances in available income-expenditure accounts.

TABLE 19.--Service and economic data, Grand Traverse Region hospitals, 1967

County and hospital	Control[a]	Service[b]	Stay[c]	Beds	Occupancy	Total expense	Total payroll	Personnel, full-time equivalent
					Percent	1,000 dollars		
Benzie:								
Paul Oliver Memorial	23	General	S	43	78.6	499	271	67
Crawford:								
Mercy	21	General	S	68	83.0	855	495	101
Grand Traverse:								
Munson Memorial	23	General	S	250	80.8	3,794	2,675	609
Traverse City Osteopathic[d]	23	General	S	73	85.0	1,070	617	152
Traverse City State	12	Psychiatric	L	2,610	94.8	7,555	6,089	905
Kalkaska:								
Kalkaska Memorial[d]	13	General	S	20	58.3	176	97	28
Leelanau:								
Leelanau Memorial	23	General	S	29	66.1	279	153	40
Wexford:								
Mercy	21	General	S	128	81.2	2,029	1,063	260
Total								
All hospitals				3,221		16,257	11,460	2,162
General hospitals and osteopathic hospitals				611		8,702	5,371	1,257

[a]Control: Institutional arrangements governing hospital. Code: 12 = State hospital; 13 = County hospital; 21 = Church-related, voluntary nonprofit; 23 = other nonprofit.

[b]Service: Main medical orientation

[c]Stay: S = Short-term, over 50 percent of all patients admitted have a stay of less than 30 days; L = Long-term, 50 percent of all patients admitted have a stay of more than 30 days.

[d]Estimated totals: the method is explained in Table 20.

TABLE 20.--Method of estimating characteristics of the osteopathic and Kalkaska hospitals[a]

Item estimated	Method	Osteopathic		Kalkaska	
		Calculation	Estimate	Calculation	Estimate
Total expense.	Number of patient days multiplied by the average total expense per patient day in similar U.S. hospitals	22,643 x $47.24	$1,069,650	4,259 x $41.42	$176,410
Payroll expense.	Number of patient days multiplied by the average payroll expenses per patient day in similar U.S. hospitals	22,643 x $27.23	$616,570	4,259 x $22.73	$96,890
Number of personnel.	Average number of patients per day multiplied by the average number of personnel per patient days in similar U.S. hospitals	$\frac{22,643}{365}$ x 2.45	152	$\frac{4,259}{365}$ x 2.37	28

[a]Estimates of personnel and expense per patient day were based on U.S. averages for hospitals with similar size, control, service, and stay characteristics as these hospitals. Number of patient days based on data in Michigan State Plan for Hospital and Medical Facilities Construction, 1968-69 (Lansing, Michigan: Department of Public Health); Hospitals, Journal of the American Hospital Association, XLII (August, 1968).

The information in Table 19 is the first definitive insight into the region's medical economy. In 1967 the hospitals spent some $16.3 million, $11.5 million (70.5 percent) of which represented the payroll expense of 2,162 hospital personnel. The average wage for hospital personnel was $5,319. The 1967 national wage in community hospitals was $4,476.[3] The average wage in Michigan hospitals was approximately $4,000.[4] The differential can probably be most readily explained by the existence in the region of relatively high quality and comprehensive hospital services, which enable the region to attract a more productive labor force than do other regions.[5]

Income Distribution by Source of Funds

To obtain an initial approximation of the distribution of hospital incomes by source of funds, it will be assumed that the regional distribution is the same as the national one. This will provide an estimating framework that could be used in any region of the United States. However, as the chapter develops these estimates will be modified by particulars of the Grand Traverse Region. The national structure will also be modified to permit the development of a method to evaluate interregional trade in hospital services.

Trade value is defined as the difference between the hospital sector's income and the population's expenditure on hospital services.

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[3] Hospitals, Journal of the American Hospital Association, XLII (August, 1968), 445.

[4] U.S. Bureau of the Census, County Business Patterns, 1967, Michigan CBR 67-24 (1968), p. 14.

[5] These average wage figures lose some comparability as a result of the different sources in each case; the pattern, however, is expected to be valid.

A positive difference would be the value of exported hospital services, that is, hospital services supplied but not paid for locally. A negative difference would be the value of imports, that is, hospital expenditures over and above the income of the region's hospitals. The latter would doubtless be particularly relevant in analyses of regions devoid of hospitals. Judging by the evidence already presented regarding the size and scope of the hospital complex in the Grand Traverse Region, a substantial positive difference is expected.

Table 21 is a detailed account of how national hospital expenditures are distributed, both according to their source and destination. Sources are consumers, philanthropy, and government. Destinations are type of hospital (major service offered) and control (type of ownership). In 1967 consumers and government contributed $8.8 billion and $8.9 billion, respectively, of the nearly $18 billion national expenditures on hospital services. Federal funds provided 63 percent of the public share, and local governments provided 37 percent. This marks a significant increase from 1966, when the federal government spent $6.2 billion, or 40 percent of the total. Consumer spending, on the other hand, decreased from 58 percent of the total in 1966 to 49 percent in 1967. This change is largely the result of Medicare having taken over a substantial portion of hospital bills for people 65 years old and over. The change shows up particularly strongly in nongovernment hospitals where government expenditures jumped from $1.6 billion or 17 percent of total expenditures in 1966, to $3.8 billion or 35 percent in 1967. Over the same period, consumer spending in these hospitals declined from $7.3 billion, or 79 percent, to $6.8 billion, or 62 percent.

This information can now be applied to the region's hospitals. Incomes from Table 19 are multiplied by the appropriate percentages shown

TABLE 21.--Hospital income by hospital control, service, and source of funds, Grand Traverse Region, 1967

Source of funds	Unit	All hospitals	Type of hospital		
			General	Tuberculosis	Psychiatric
		All hospitals			
Consumers.	Mil. dol.	8,752.0	8,439.8	10.5	301.1
	Percent	48.8	54.2	13.2	13.1
Public	Mil. dol.	8,854.2	6,790.2	69.0	1,995.0
	Percent	49.3	43.6	86.8	86.9
Federal.	Mil. dol.	5,548.7	5,257.8	1.5	289.4
	Percent	30.9	33.8	1.9	12.6
State and local.	Mil. dol.	3,305.5	1,532.4	67.5	1,705.6
	Percent	18.4	9.8	84.9	74.3
Philanthropy . . .	Mil. dol.	340.0	340.0	--	--
	Percent	1.9	2.2	--	--
Total.	Mil. dol.	17,946.2	15,570.0	79.5	2,296.7
	Percent	100.0	100.0	100.0	100.0
		Federal hospitals			
Consumers.	Mil. dol.	176.7	176.7	--	--
	Percent	9.4	11.3	--	--
Public	Mil. dol.	1,700.2	1,386.0	1.5	312.7
	Percent	90.6	88.7	100.0	100.0
Federal.	Mil. dol.	1,676.9	1,386.0	1.5	289.4
	Percent	89.3	88.7	100.0	92.5
State and local.	Mil. dol.	23.3	--	--	23.3
	Percent	1.3	--	--	7.5
Total.	Mil. dol.	1,876.9	1,562.7	1.5	312.7
	Percent	100.0	100.0	100.0	100.0

Continued--

TABLE 21.--Hospital income by hospital control, service, and source of funds, Grand Traverse Region, 1967 --continued

Source of funds	Unit	All hospitals	Type of hospital		
			General	Tuberculosis	Psychiatric
		State and local government hospitals			
Consumers.	Mil. dol.	1,728.4	1,568.6	7.5	152.3
	Percent	34.2	49.9	10.0	8.3
Public	Mil. dol.	3,325.3	1,575.5	67.5	1,682.3
	Percent	65.8	50.1	90.0	91.7
Federal.	Mil. dol.	634.3	634.3	--	--
	Percent	12.6	20.2	--	--
State and local.	Mil. dol.	2,691.0	941.2	67.5	1,682.3
	Percent	53.2	29.9	90.0	91.7
Total.	Mil. dol.	5,053.7	3,144.1	75.0	1,834.6
	Percent	100.0	100.0	100.0	100.0
		Nongovernmental hospitals			
Consumers.	Mil. dol.	6,846.9	6,694.5	3.0	149.4
	Percent	62.1	61.6	100.0	100.0
Public	Mil. dol.	3,828.7	3,828.7	--	--
	Percent	34.8	35.2	--	--
Federal.	Mil. dol.	3,237.5	3,237.5	--	--
	Percent	29.4	29.8	--	--
State and local.	Mil. dol.	591.2	591.2	--	--
	Percent	5.4	5.4	--	--
Philanthropy . . .	Mil. dol.	340.0	340.0	--	--
	Percent	3.1	3.2	--	--
Total.	Mil. dol.	11,015.6	10,863.2	3.0	149.4
	Percent	100.0	100.0	100.0	100.0

Source: Social Security Bulletin, XXXII (January, 1969), 7.

in Table 21 for state and local government and nongovernmental hospitals. The results are shown in Table 22. These are estimates of the distribution of the region's hospitals' incomes by source of funds, under the assumption that the regional and national distribution are similar.

These are initial estimates. Some modifications will become apparent as the study proceeds and particular information about individual hospitals is brought out. Nevertheless, for the most part, the estimates of the distribution by source will be assumed essentially correct. One of the major innovations in succeeding sections will be to subdivide these sources further by considering their location.

Regional Distribution of Hospitals' Incomes

Now that the initial hospital incomes have been distributed by type of payer, the next step is to uncover the geographic location of these payers and subsequently, to find out the proportions of the income originating from within and outside the region.

Patient origin data are available for most of the regions' hospitals. This will simplify estimating the geographic source of consumer payments. Philanthropic payments are assumed to originate with the region or with the state for the psychiatric hospital. The amount of these donations is relatively small. Furthermore, it seems reasonable to expect that most or all donations to local hospitals come from local sources.

Public payments present greater analytical problems than consumer and philanthropic payments. For federal funds, the bulk of which are Medicare reimbursements, it is necessary to estimate a net figure that represents the difference between total reimbursements received by the hospitals and Medicare premiums paid by the region's population. A

TABLE 22.--Income and source of funds, Grand Traverse Region hospitals, 1967

County and hospital	Total income	Source of funds							
		Private				Public			
		Consumer		Philanthropy		Federal		State and local	
	Thou.	Thou.	Percent	Thou.	Percent	Thou.	Percent	Thou.	Percent
Benzie:									
General.	499.0	307.4	61.6	16.0	3.2	148.7	29.8	26.9	5.4
Crawford:									
General.	855.0	526.7	61.6	27.4	3.2	254.8	29.8	46.1	5.4
Grand Traverse:									
General.	3,794.0	2,337.1	61.6	121.4	3.2	1,130.6	29.8	204.9	5.4
Osteopathic.	1,070.0	659.1	61.6	34.2	3.2	318.9	29.8	57.8	5.4
Psychiatric.	7,555.0	627.1	8.3	--	--	--	--	6,927.9	91.7
Kalkaska:									
General.	176.0	87.8	49.9	--	--	35.6	20.2	52.6	29.9
Leelanau:									
General.	279.0	171.9	61.6	8.9	3.2	83.1	29.8	15.1	5.4
Wexford:									
General.	2,029.0	1,249.9	61.6	64.9	3.2	604.6	29.8	109.6	5.4
Total.	16,257.0	5,967.0	36.7	272.8	1.7	2,576.3	15.8	7,440.9	45.8
General hospitals and osteopathic hospitals	8,702.0	5,339.9	61.4	272.8	3.1	2,576.3	29.6	513.0	5.9

Detail may not add to totals due to rounding.

positive difference will represent a net transfer of funds into the region, and vice versa.

State and local funds are aggregated in Table 22. These will be separated and, as with federal funds, a net movement will be attributed to state funds.

The analysis will follow three steps: (1) the value of services paid for from nonregional sources will be estimated; (2) the value of services purchased outside the region and paid for with regional funds will be estimated; and (3) these two estimates will be used to obtain an estimate of the net value of interregional trade in hospital services.

Regional Distribution of Patients

Residential origins of patients receiving hospital services in the region in 1967 are shown in Tables 23 and 24. The information for general hospitals (Table 23) is drawn from a 1967 hospital patient census.[6] Psychiatric data (Table 24) are estimates based on a 1965 census. Both show the regional origin of the patients and clearly indicate that the region's hospitals are providing a substantial amount of hospital services to people from outside the eight counties. The next few sections of this chapter will be concerned with placing a value on this and related trade.

Consumer Expenditures

Three assumptions are necessary if the information presented so far is to be used to estimate trade figures. The first is that the number of patient days of hospital care provided to any one county's population is

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[6]Such complete and current information is available for a few areas in the United States. Attempts to gauge the distribution of hospital patients in many other multicounty regions would probably depend on estimating procedures.

TABLE 23.--Patient discharges by residential origin, general hospitals, Grand Traverse Region, 1967

County	All discharges	Regional residents		Nonregional residents	
	Number	Number	Percent	Number	Percent
Benzie	1,109	881	79.5	228	20.5
Crawford	2,617	969	37.0	1,648	63.0
Grand Traverse[a]	11,043	9,558	86.4	1,485	13.4
Kalkaska	625	591	94.5	34	5.5
Leelanau	797	712	89.3	85	10.7
Wexford	5,206	4,084	78.4	1,122	21.6
Total	21,397	16,795	78.5	4,602	21.5

[a]Includes information for general and osteopathic hospitals.

Source: Health Planning Council of Michigan, 1967 Patient Origin Study, North Central Region (Lansing, Michigan: Health Planning Council of Michigan, 1968).

TABLE 24.--Estimated patient origin by residence, psychiatric hospital, Grand Traverse City, 1967

Patient origin	Patients
Regional	270
Nonregional	2,204
Total patients	2,474

Source: Table 22 and Michigan Department of Mental Health, Mental Health Statistics, July 1, 1964 - June 30, 1965 (Lansing, Michigan: Michigan Department of Mental Health, 1965). Patient origin data are unavailable for 1967. It is assumed that the regional distribution in 1967 was the same as in 1965.

distributed in the same proportion to total patient days as the number of discharges for one county is to total discharges. The second is that the number of patient days does not vary significantly among patients from different counties. The third is that there is no discrimination in hospital charges according to a person's residence. There is no available evidence to dispute the final assumption; the other two assumptions rest upon reasonable expectations and the improbability that hospitals take different lengths of time to provide the same services to people from different regions.

General Hospitals

With these assumptions made, it is a straightforward matter to obtain the trade patterns for consumer expenditures by applying the percentages in Table 23 to the consumer expenditure totals in Table 22. The results appear in Table 25. They show that the region's general hospitals sold, or exported, hospital services valued at $1,059,000 to nonregional consumers in 1967. This amounted to 19.8 percent of the value of general hospital services sold directly to consumers, both regional and nonregional.

Psychiatric Hospital

To estimate consumer payments to the psychiatric hospital, it is necessary to know the number of private paying patients and the cost per day. The former is estimated to have been 257 patients. It was obtained by taking the proportion of private paying patients plus half the partially publicly supported patients in 1965, and assuming that the same proportions held in 1967.[7] The assessed cost per patient day was

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[7]Patient costs are court-apportioned. A patient may be fully publicly supported, fully privately supported, or partially publicly

TABLE 25.--Regionalization of consumer expenditures on hospital services, Grand Traverse Region, 1967

Hospitals and county	Consumer expenditures				
	Total	Regional		Nonregional	
	1,000 dollars	1,000 dollars	Percent	1,000 dollars	Percent
General hospitals:					
County--					
Benzie	307.4	244.4	79.5	63.0	20.5
Crawford	526.7	194.9	37.0	331.8	63.0
Grand Traverse[a]	2,997.2	2,624.7	87.6	371.5	12.4
Kalkaska	87.8	83.0	94.5	4.8	5.5
Leelanau	171.9	153.5	89.3	18.4	10.7
Wexford	1,249.9	980.0	78.4	269.9	21.6
Subtotal	5,339.9	4,280.5	80.2	1,059.4	19.8
Psychiatric hospital	844.2	85.4	10.1	758.8	89.9
Total	6,184.1	4,365.9	71.6	1,818.2	28.4

[a]General and osteopathic hospitals combined. Expenditures have been prorated on the basis of total number of admissions, patient days, and cost per patient day.

approximately $9.00 in 1967.[8] Consumer expenditures can be estimated by expressing the cost per day or an annual basis and multiplying by the number of patients. The estimate, $844,200, is somewhat greater than the preliminary estimate of $627,100 given in Table 22.

Twenty-six of the 257 privately paying patients were residents of the Grand Traverse Region. Their expenditures, estimated by the method used above, were $85,410. Nonregional consumer payments, assumed to represent the difference between total consumer payments and regional consumer payments, were $758,835. These results are shown in Table 25.

Philanthropic Expenditures

Philanthropic payments to the general hospitals were estimated in Table 22 to be $272,800. Since no additional information is available this estimate will be used. For the psychiatric hospital, the preliminary estimates show no philanthropic income. This, however, must be refined. State financial records show that philanthropic income averaged $89,900 for the fiscal years 1967 and 1968.[9] Philanthropic income is actually the amount spent from a special maintained state account. Since it is necessarily spent in the year received, it is considered nonregional in origin.

Federal Government Expenditures

General Hospitals

It was estimated that the federal government spent $2,576,300 for general hospital services in the Grand Traverse Region in 1967 (Table 22).

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supported and privately supported. The latter proportion is assumed to be 50 percent public and 50 percent private.

[8]Actual costs were $8.55 in fiscal 1967 and $9.45 in fiscal 1968. The average is used for the 1967 calendar year.

[9]State of Michigan, Detail Financial Statements, 1966-67 and 1967-68

This however, should not be regarded as an unilateral transfer. Fifty-six percent was insurance for the aged under the Medicare program (Table 26). This program is partially financed with social security taxes. By deducting an estimated value of the region's contribution to hospital insurance from the estimate of Medicare reimbursements to the region, it will be possible to reduce the value of federal expenditures to a figure which may be regarded as a net transfer. It is realized that some proportion of the net will still be financed from the region's taxes. The adjustment, however, would be minor; consequently, it will be overlooked.

Virtually all United States residents 65 years of age and over are eligible for benefits under the compulsory program of hospital insurance, Medicare. The program is financed by a schedule of contribution rates applied to a maximum earnings base. The base was $6,700 in 1967. This income is channeled into a hospital insurance trust fund from which all benefits and administrative costs are paid. The contribution rate, 0.5 percent in 1967, applies equally to employees and the self-employed. The cost of benefits for people who are not entitled to social security or railroad retirement benefits is paid from general funds of the Treasury.[10]

Total earnings in the region, subject to social security taxes, are estimated at $98,242,000. The largest part of this sum, $97,192,000, is estimated earnings of the covered work force.[11] The difference of

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[10]U.S. Department of Health, Education, and Welfare, Social Security Programs in the United States (Washington: Social Security Administration, March, 1968), pp.43-44. Note: The earnings base and contribution rate cited in this publication are for 1968; they are $7,800 and 0.6 percent, respectively.

[11]U.S. Bureau of the Census, County Business Patterns, 1967, pp. 18-19.

TABLE 26.--Federal hospital care expenditures by program, United States, 1967

Program	Total expenditure	Percentage of total
	Million dollars	Percent
Health insurance for the aged.	3,102.0	56.0
Workmen's compensation (medical benefits).	9.8	0.2
Public assistance (vendor medical payments).	609.0	10.9
General hospital and medical care. . . .	146.9	2.6
Defense Department hospital and medical care (including military dependents) .	545.0	9.9
Maternal and child health services . . .	27.7	0.5
Veterans' hospital and medical care. . .	1,079.1	19.4
Medical vocational rehabilitation. . . .	26.2	0.5
Total.	5,548.7	100.0

Source: Social Security Bulletin, XXXII (January, 1969), 9.

$1,050,000 is an estimate of the earnings of self-employed people, based on an estimated self-employed work force of 2,250 people and the average wage in the eight-county region.[12]

The amount of Medicare reimbursements received by regional hospital patients is estimated to have been $1,849,000 in 1967. This was arrived at by multiplying the number of enrollees, people aged 65 and over, by $148.20, the annual average reimbursement per Michigan enrollee.[13] Average Michigan reimbursements were actually $154.80 in metropolitan counties with a central city, $157.08 in metropolitan counties without a central city, and $131.40 in nonmetropolitan counties. It is felt, however, that the special characteristics of the Grand Traverse Region's hospital facilities would be more accurately reflected were the state average reimbursement used rather than the nonmetropolitan county average.

Medicare reimbursements to regional patients amounted to $1,849,000 of the $2,576,300 of federal funds. The balance of $727,300 can be accounted for mainly by Medicare reimbursements to nonregional patients. A small amount, if any, may be attributed to the general hospital and medical care programs. If regional Medicare premiums, estimated at $977,000, are subtracted from the $2,576,300 total federal payments, there is a balance of $1,599,300 which may be regarded as a net transfer of federal funds into the region.[14] This is 18.4 percent of the income of all general hospitals. This transfer represents a sizable net return

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[12] Overall Economic Development Program.

[13] U.S. Department of Health, Education, and Welfare, Health Insurance Statistics, No. HI-9 (Washington: Social Security Administration, December 19, 1968), table 1.

[14] Estimation of regional Medicare Premiums: 10.0 percent of the earnings of the covered work force ($97.2 million x 0.10), plus 5.0 percent of the earnings of the covered self-employed work force ($1.0 million x 0.05) = $977,000.

from the federal government to the region's medical economy.

Psychiatric Hospital

The psychiatric hospital at Traverse City received $36,796.98 from the federal government in fiscal 1966-67 and $28,168.60 in fiscal 1967-68.[15] All State of Michigan accounts are maintained on a fiscal year basis. Where, as in this case, specific details are required, it has been decided to take a simple average of the two years' expenditures to represent the calendar year 1967 expenditure. Thus, federal expenditures on the psychiatric hospital are estimated at $33,000, a figure which represents a further refinement in Table 22.[16]

State and Local Government Expenditures

State and local governments were preliminarily estimated to have spent $7,440,900 on the region's hospitals in 1967. This is the largest quantity of funds from one source. The estimated amount for the state and local cost of maintaining the psychiatric hospital was $6,927,900 or 93.1 percent of the total. The financial significance of this institution requires that it receive special attention; accordingly its source of funds will be analyzed before a movement is made to the relatively smaller state and local financing of the general hospitals.

Psychiatric Hospital

The 1967 income of the psychiatric hospital was estimated as $7,555,000 (Table 22). Actual expended appropriations in the two fiscal

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[15] State of Michigan, Detail Financial Statement.

[16] Some privately paying patients may be on Medicare. Medicare support of mental patients is slight however. There are no data to indicate the age distribution of the patients in the psychiatric hospital. Since the proportion of privately paying patients is relatively low anyway, no allowance will be made for Medicare payments.

years 1966-67 and 1967-68 were $7,750,415.81 and $8,141,834.52.[17] An analysis of the accounts reveals that these relatively high reported expenditures include sums for forwarded unexpended balances. However, if these balances are deleted for 1966-67 and prorated for 1967-68, the average expenditure over the two year period is approximately equal to the estimated $7,555,000.

Actual state and local payments are estimated to be $6,587,900. This was obtained by taking the difference between total payments and the sum of the payments attributed to other sources. To separate the region's contribution to state and local payments, the total can be divided according to the proportions of regional and nonregional publicly supported patients. Out of 2,217 public patients, 1,973 (89.0 percent) were nonregional, and 244 (11.0 percent) were regional. When these proportions are applied to the total, the nonregional share of expenditures is $5,863,200, and the regional share is $724,700.

This approach is a useful first step towards regional separation of nonfederal public funds. Nevertheless, from the point of view of the eight-county region, it is insufficient because the regional total overstates the actual regional contribution. The reason lies in the method of financing. A publicly supported patient is paid for by the county for the first year and by the state thereafter. In looking at regional expenditures, therefore, allowances must be made for two things that reduce the region's share and increase the state's share. These are the state's payment for long-term patients and the state's reimbursement to counties for health expenditures. Assuming that half the regional patients had been in the hospital for more than a year, half the bill for publicly

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[17] State of Michigan, Detail Financial Statements, 1966-67, p. 63, and 1967-68, p. 60.

supported patients automatically falls on the state. The other half is paid by the county, but the state pays an average of 50 percent of the region's health expenditures. Therefore an additional quarter of the cost falls on the state. In all, given the assumptions, 75 percent of the cost of publicly supported regional patients is borne by the state and not by the region at all.[18]

Using this analysis, it can be assumed that the state automatically pays the full bill for half of the 244 publicly supported patients, and an additional half the bill for the remaining 122. Thus, the state pays for the equivalent of 183 patients, the counties for 61, and 26 are private paying.[19]

The economic effect of shifting payments from regional counties to the state is that it increases exports of medical services. Table 27 shows that the estimated cost of maintaining the 270 regional psychiatric patients was $810,000. It also shows that dividing maintenance costs according to the criteria outlined above shifts $524,305 to the state, thereby reducing the effective regional expenditure to the sum of private and residual county expenditures: $285,795.

The complete distribution of the psychiatric hospital's income is presented on a regional basis (Table 28). It attributes $7,269,205 or 96.2 percent of the hospitals' total income to nonregional sources. This is a substantial interregional transfer of funds which must have a significant economic impact on the region.

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[18]Indirect regional payments through state taxes are not being taken into account. The focus is upon initial transfers to and from primary recipients and payers.

[19]These estimates were also based on 1964-65 admissions data, the most up-to-date source available. Partially supported patients were equally divided between full public and full private.

TABLE 27.--Cost analysis for psychiatric patients in the Traverse City State Mental Hospital, 1967

Type of support	Average daily census	Annual patient days	Cost per patient day	Annual cost
	Number	Number	Dollars	Dollars
Private.	26	9,490	9.00	85,410
County	61	22,265	9.00	200,385
State.	183	66,795	7.85	524,305
Total. . . .	270	98,550	(a)	810,000

[a]The average cost per patient day was $8.22.

TABLE 28.--Distribution of income by source of funds, Traverse City State Mental Hospital, 1967

Source of funds	Expenditures	Percentage
	Dollars	Percent
Regional:		
County governments	200,385	2.7
Consumers	85,410	1.1
Regional total	285,795	3.8
Nonregional:		
Federal government	33,000	0.4
Consumers	758,835	10.0
Philanthropy	89,850	1.2
State and local governments	6,387,520	84.6
Nonregional total	7,269,205	96.2
Total income	7,555,000	100.0

General Hospitals

There have always been the medically indigent--people who needed hospitalization or medical care but who were unable to pay for it. In some regions such people either went without attention or had their expenses paid by philanthropic or local governmental sources or assumed by the hospital, in which case they were usually paid indirectly by other patients. In the Grand Traverse Region most of these expenses were paid prior to 1966 by the county governments and the hospitals.

Since 1966, however, federal and state programs have taken much of the financial responsibility for the indigent away from local authorities. County governments, which traditionally maintained the indigents, now find that their health assistance costs have been reduced.

This does not mean these costs have been eliminated. There are still bad debts and sundry indigents who, for one reason or another, are ineligible for, or unaware of, the new programs. There are also the Indian and migrant worker populations. Federal programs have been designed to assist with these groups' medical needs, but this is a relatively recent innovation.

The Grand Traverse Region's county governments, possibly influenced by the need to attract a regular annual supply of fruit pickers, still assume most indigents' expenses that are not met by the federal or state governments.

Neither total expenditures for health care nor the distribution among health services can be ascertained clearly from county financial reports.[20] Therefore, previous estimates of state and local hospital

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[20]State of Michigan, Michigan County Government, Financial Report (Lansing, Michigan: Department of Treasury, 1968). Health expenditures are not recorded so that they can be disaggregated satisfactorily for this study.

expenditures will be used. These can be apportioned among regional counties, nonregional counties, and the state as follows. Estimated expenditures were $513,000. Approximately one fifth (21.5 percent) of the patients were nonregional (Table 23, page 76). Most of these were from surrounding counties, however, so it may be assumed they were as likely to be supported by their county governments as regional patients were. Thus, $110,300 (21.5 percent of $513,000) may be regarded as externally originating funds. Since the state contributes an average of 50 percent of the counties' revenues, the remaining $402,700 may be divided equally between state and local sources.[21]

These results are in Table 29. It shows that of the $513,000 spent by state and local governments on general hospital services, $201,000 came from regional sources and $311,600 from nonregional sources.

Interregional Trade in Hospital Services

The analysis of the interregional financing of exported hospital services is now complete. The results, summarized in Table 30, show that 69.0 cents of each dollar spent on hospital services in the region comes from a nonregional source. Total nonregional expenditures are estimated in excess of 11 million dollars. From the trade point of view, a useful way to consider the expenditures is as payments for exports and, clearly, the region is heavily engaged in exporting medical services. But before drawing any conclusions in this respect, the other components of the health industry must be analyzed.

Before moving to the other sectors, however, recognition must be given to 968 of the region's population who received hospital care

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[21] Ibid., p. 22-23.

TABLE 29.--Interregional nonfederal public financing of general hospital services, Grand Traverse Region, 1967

Item	Expenditure	Percentage
	1,000 dollars	Percent
Total expenditures.	513.0	100.0
Nonregional expenditures:		
Regional patients	201.3	39.2
Nonregional patients.	110.3	21.5
Regional expenditures:		
Regional patients	201.4	39.3

TABLE 30.--Interregional financing of hospital services, Grand Traverse Region, 1967

Item	Income	Source of funds								
		Total	Consumers	Philanthropy	Local govt.	Total	Consumers	Philanthropy	Federal govt.	State and local govt.
	1,000 dollars	Regional				Nonregional				
		1,000 dollars				1,000 dollars				
Hospitals:										
General[a] . .	8,702.0	4,754.7	4,280.5	272.8	201.4	3,947.3	1,059.4	--	2,576.3	311.6
Psychiatric.	7,555.0	285.8	85.4	--	200.4	7,269.2	758.8	89.9	33.0	6,387.5
Total . .	16,257.0	5,040.5	4,365.9	272.8	401.8	11,216.5	1,818.2	89.9	2,609.3	6,699.1
	Percent	Percent				Percent				
Percent. .	100.0	31.0	26.8	1.7	2.5	69.0	11.2	0.5	16.1	41.2

[a]Includes the osteopathic hospitals.

outside the region.[22] A number of these, 152 to be precise, were patients in the Veterans' Administration hospital at Saginaw. Their major expenses were met by the federal government. Expenses for another 100 patients were paid for under other public programs, primarily Medicare.[23] It will be assumed that any large expenditures incumbed by the remaining 700 or so patients were covered by private insurance programs. Hence the outflow of funds from the region attributable to imported hospital services is included in medical insurance. This component will be taken up in the next chapter.

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[22]Health Planning Council of Michigan, 1967 Patient Origin Study, North Central Region (Lansing, Michigan: Health Planning Council of Michigan, 1968).

[23]This assumes that the proportion of the region's population aged 65 and over (12.74 percent) is applicable for the region's population travelling outside the region.

Chapter VI

INCOME AND EXPENDITURE ACCOUNTS--NONHOSPITAL COMPONENTS

The preceding chapter described what could be the heart of almost any region's medical complex, the hospitals. This chapter will focus on the other components. Though less important than hospitals from the financial point of view, nonhospital components have an essential role in delivering medical services that supplement and complement hospital services.

Incomes estimated in this chapter are those of the region's physicians, dentists, and other medical professionals, those of its retail pharmaceutical stores and medical appliance and optical stores; and those of its nursing homes, public health services, and miscellaneous or "other" health services.[1] Detailed data of the type used in analyzing the hospitals is rarely available for any of the other components. As a result, the format will differ from that followed previously. With a few exceptions, components will be analyzed for the whole region rather than for individual counties. Each component's income will be estimated. Then an analysis of the source and interregional movement of funds will be performed on all components as a group. The results will be added to those from the preceding chapter, so that the conclusions of this chapter will show the amount, recipients, and sources of the region's

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[1]Medical and osteopathic doctors' incomes will be estimated separately. For the sake of brevity the former will be referred to as physicians and the latter as osteopaths.

total 1967 medical income. The research will still be based on the criterion of developing and using estimates which are relevant to the Grand Traverse Region, but which are based on the type of information and methodology that would facilitate the development of similar estimates for other multicounty regions.

Physicians

There were 128 practicing physicians in the region in 1967 (Table 16, p. 55). Thirty-six of these were hospital based; their salaries are a component of hospital care, and are already accounted for. Of the remainder there were 36 general practitioners, 16 medical specialists, 27 surgical specialists, and 13 other specialists.

There are significant differences in the earnings of physicians according to their major field of practice and the area in which they practice (Table 31). Midwestern physicians' incomes are relevant to this study. They will be used as estimates of physicians' incomes in the Grand Traverse Region. There are insufficient data to conduct a separate analysis of incomes of specialists who are in neither the medical nor surgical fields. Nevertheless, there is sufficient evidence to suggest that their incomes are quite close to those of medical specialists. Accordingly, the category containing 16 medical specialists will be expanded to 29, thus including the 13 other nonsurgical and nonmedical specialists.

Estimates of net incomes for physicians in the region can be obtained by multiplying the number of physicians in each field of practice by the appropriate income from Table 31 for physicians in the Midwest. Gross incomes can be obtained by dividing net incomes by 0.60, the percentage of gross income reported to the Internal Revenue Service as the

TABLE 31.--Physicians' net income by field of practice, United States, 1967[a]

Area	Net income of:		
	Solo general practitioners	Solo medical specialists	Solo surgical specialists
	Dollars	Dollars	Dollars
East.	25,560	31,600	37,670
South	31,250	33,330	38,820
Midwest	31,330	34,170	41,000
West.	32,920	33,180	32,940

[a]Net income is from practice after payment of tax deductible professional expenses, but before payment of income tax.

Source: Medical Economics (February 3, 1969), p. 95.

average net income of physicians.[2] These calculations and the resulting incomes are shown in Table 32. The total gross income of $5,376,350 will be used as the 1967 estimated gross income of the region's nonhospital-based physicians.[3]

Dentists

There were 51 practicing dentists in the region in 1967 (Table 16, p. 55). The mean net income for nonsalaried Michigan dentists was

[2]U.S. Department of the Treasury, "Preliminary Statistics of Income, 1967," Business Income Tax Returns (unpublished).

[3]Estimates of physicians' earnings are difficult to verify. Nevertheless, several medical personnel in the region indicated in conversations that these were probably sound. Sarkar estimated the net income of Copper Country physicians at over $41,000. These higher earnings may reflect the relatively lower supply of physicians in the Copper Country medical industry.

TABLE 32.--Grand Traverse Region's physicians' incomes, 1967

Field of practice	Physicians	Net income	Gross income
	Number	Dollars	Dollars
General practice.	36	1,127,880	1,879,800
Medical specialties	29	990,930	1,651,550
Surgical specialties. . . .	27	1,107,000	1,845,000
Total	92	3,225,810	5,376,350
Average		35,063	58,438
General practitioners. . . .		31,330	52,216

$25,753, or 52.2 percent of the gross income of $49,257.[4] Assuming that these incomes are reasonable estimates for the region, total regional dental incomes can be calculated by multiplying the average incomes for dentists in all of Michigan by the number of dentists in the region. The results are shown in Table 33.

The American Dental Association's 1968 survey of dental practice shows some variation in dental incomes according to the size of the city in which dentists practice. Were the present study concerned with a less medically-oriented rural area, consideration would be given to changing the estimated incomes to reflect lower than average incomes earned in rural areas. But for the Grand Traverse Region, where dentists are part of a sophisticated medical community and the quality of professional care is high, it is felt that dentists, like other medical professionals, should have no difficulty in attaining state average incomes at least.

[4]American Dental Association, "Income of Dentists by Location, Age and Other Factors," in 1968 Survey of Dental Practice, II, Report of Councils and Bureaus (Chicago: American Dental Association, 1968), 345.

TABLE 33.--Grand Traverse Region's dentists' incomes, 1967

	Dentists	Net income	Gross income
	Number	Dollars	Dollars
Total.	51	1,313,403	2,512,107
Average[a]		25,753	49,257

[a]These estimates are close to those Sarkar found for the Copper Country medical industry.

Osteopaths

The United States average gross income of osteopaths was $35,590 in 1967.[5] State estimates for 1965 show that Michigan osteopaths' incomes were 93 percent higher than national averages.[6] Assuming the same relationship held in 1967, the Michigan average gross income would have been $68,688. Net earnings for 1967 were 52 percent of gross; therefore, the average net income of Michigan osteopaths would have been $35,717. Assuming these estimates are valid for the Grand Traverse Region and multiplying by 27 (the number of osteopaths in private practice), total gross and net incomes of $1,854,576 and $964,359 are obtained.

The estimated average net earnings of osteopaths are very close to the average for all physicians; their average gross earnings, however, are higher, though approximately the same as the average gross income of surgeons.

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[5]U.S. Department of the Treasury, "Preliminary Statistics of Income, 1967."

[6]U.S. Department of the Treasury, Statistics of Income, 1965 (Washington: U.S. Government Printing Office, 1966), pp. 38 and 80.

These results may be coincidental and depend on the estimating techniques. An alternative and more positive argument is that the equality is to be expected. From the consumers' point of view the two professions provide many essentially substitutive services. Consumers are, therefore, unlikely to favor one over the other unless the prices are different. Furthermore, most of the region' osteopaths and physicians are located in Traverse City. Hence, both groups practice in a similar medical environment.

"Other" Professionals

In the HEW classifications, "other" professional medical services are those of: medical and dental laboratories, chiropractors, private registered and practical nurses, proprietary hospitals, sanatoriums, convalescent and rest homes, and a medical sector for such items as industrial and implant health services. Laboratories, nurses, and chiropractors will be focused upon in this section. The others are either nonexistent in the region or will be taken up under nursing homes.

There was one dental laboratory and one chiropractor in the region in 1967; and in 1965, the last year for which information is available, 15 of the region's 316 practicing nurses were in private practice.[7] There is no specific business denoted as a medical laboratory. Laboratory services are provided by doctors' offices, drug stores, and hospitals; it will be assumed that their incomes include the region's expenditures on medical laboratory services.

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[7] 1964-65 Annual Report of the Michigan Board of Nursing (Lansing, Michigan: Michigan Board of Nursing, 1966), pp. 11-12 and 17-18.

Annual income data for laboratories, chiropractors, and nurses are available from the Treasury Department. Data for 1967 are available on a national basis.[8] The most recent year for which state data have been published is 1965. Assuming that the proportionality between state and national incomes in 1967 was the same as in 1965, 1967 state estimates can be obtained by weighting the data by the 1965 differential. This method is used for the laboratory and chiropractor. The differential is 10.7 percent, the amount by which the average income of Michigan's "other medical services" (the relevant component of the state tax data) is greater than the United States average.[9] Nurses' incomes were not published separately in the 1967 Statistics of Income. They are available for 1966 on a national basis. To convert to 1967 Michigan estimates, the incomes will be increased by 8.0 percent, the average increase in medical professional fees between 1966 and 1967, then by 10.7 percent, the state adjustment. The calculations and resulting estimated incomes are shown in Table 34.

The estimated total gross income of $94,570 for all "other" professional medical services in the region averages out to approximately $1 per capita for the region's population. This is markedly less than an HEW national estimate of $6.76 per capita for the same period.[10] The differences is mainly attributable to an urban bias in HEW numbers. Several professional services, in addition to medical laboratories, are

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[8]U.S. Department of the Treasury, "Preliminary Statistics of Income, 1967."

[9]U.S. Department of the Treasury, Statistics of Income, 1965, pp. 69 and 80.

[10]Social Security Bulletin (January, 1969), p. 15.

TABLE 34.--Income of the Grand Traverse Region's "other" professional medical services, 1967

Services	U.S. average gross income	Estimated Michigan average gross income	Number of services in region	Total regional gross income	Total regional net income
	Dollars	Dollars	Number	Dollars	Dollars
Dental laboratories. . .	24,390	26,000.0	1	26,000.0	8,580.0
Chiropractors.	11,435	12,660.0	1	12,660.0	6,836.0
Private nurses	3,367[a]	3,727.3	15	55,910.0	47,356.0
Total.			17	94,570.00	62,772.0

[a]The 1966 average income was $3,117.

Source: U.S. Department of the Treasury, Statistics of Income, 1965, 1966, and 1967 (Washington: U.S. Government Printing Office).

independently operated in urban regions and are accounted for in HEW's "other" professional services estimates for the nation. In rural areas, such services are either unavailable, unwanted, or provided as one of many services in hospitals or other service centers. It is reasonable, therefore, to expect a rural area to exhibit relatively low expenditures for this component.

Retail Drug Stores

Standard Rate and Data Service reports retail drug store sales by county on an annual basis.[11] Drug stores are classified by their usual trade designation rather than the merchandise lines carried. The term "retail sales" is based on the Department of Commerce definition. It represents all sales and receipts of county drug stores.

The Commerce classification of drug sales is used widely, and particularly by the Department of Health, Education, and Welfare in estimating per capita drug sales. Total drug store sales include nonmedical items. The Department of Commerce has a formula, explained in Table 35, which is used to separate drug store sales according to prescription sales, proprietary and medical sundries sales, and other sales. By applying this formula to the Standard Rate and Data Service estimates, nonmedical items can be eliminated from drug store sales. This adjustment isolates those receipts solely derived from the sale of medical products.

In making these estimates it will be assumed that the population of the eight counties makes insignificant drug purchases outside the region. This conforms with observed purchasing behavior. People tend

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[11]Standard Rate and Data Service, Inc., Newspaper Rates and Data, I. (August 12, 1968), 319 et seq.

TABLE 35.--Retail drug store sales in the Grand Traverse Region, 1967

County	Total	Prescription drugs[a]	Medical sundries and proprietary drugs	Nonmedical items
	Dollars	Dollars	Dollars	Dollars
Antrim	507,000	305,975	76,050	124,975
Benzie	652,000	393,482	97,800	160,718
Crawford	400,000	241,400	60,000	98,600
Grand Traverse	2,158,000	1,302,353	323,700	531,947
Kalkaska	307,000	185,274	46,050	75,676
Leelanau	353,000	213,035	52,950	87,015
Missaukee	202,000	121,907	30,300	49,793
Wexford	1,427,000	861,194	214,050	351,756
Total	6,006,000	3,624,620	900,900	1,480,480
Percentage	100.0	60.35	15.00	24.65

[a]Derived from the Department of Commerce formula. It allows 15 percent for sundries and proprietary drugs, 71 percent of the remainder for prescription drugs, and the rest for other items. U.S. Department of Health, Education, and Welfare, Office of the Secretary, Task Force on Prescription Drugs, The Drug Users (Washington: U.S. Government Printing Office, December, 1968), p. 14.

Source: Standard Rate and Data Service, Inc., Newspaper Rates and Data, L (August 12, 1968), 319, 322, and 323.

to purchase drugs near their home or in the vicinity of where the prescription was written.

Few people leave the region for medical services. There is, on the other hand, a significant inflow of people seeking medical attention, as well as a large seasonal inflow of tourists and workers. These persons undoubtedly make a significant addition to the region's drug store sales. A method of sharing the export trade generated by these people will be developed in the section dealing with interregional transfers.

The region's total retail drug store sales and their division into prescription drugs, medical sundries and proprietary drugs, and nonmedical items is shown in Table 35. According to these figures, the total value of sales of prescription drugs, medical sundries, and proprietary drugs was $4,525,520 in 1967. This will be taken as the estimated income of the retail drug sector.

It is of more than passing interest to note that drug store sales of $4.5 million in a region with a population of 97,000 would indicate per capita sales of $46.15. The average United States per capita expenditure was $27.55 in 1967.[12] Sometimes many factors are needed to explain why a particular regional average differs from a national one. Information for 1967 is unavailable. But data for 1964 and 1965 reveal no significant differences in per capita drug expenditures regardless of a person's residence, region, or income.[13] Assuming this was true in 1967, there must be another explanation for the observed difference in the

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[12] Social Security Bulletin (January, 1969), p. 13.

[13] U.S. Department of Health, Education, and Welfare, Office of the Secretary, Task Force on Prescription Drugs, The Drug Users (Washington: U.S. Government Printing Office, December, 1968), p. 21.

Grand Traverse Region. In this case, it is believed that the impact of medical and seasonal visitors is sufficiently substantial to be the significant factor behind the difference.

Eyeglass and Appliance Stores

The basic source of expenditures for eyeglasses and appliances is the report of personal consumption expenditures in the Department of Commerce publication, Survey of Current Business. Total expenditures estimated by the Department of Health, Education, and Welfare are obtained by adjusting Commerce figures and adding expenditures under public programs. (These are the only estimates available for this study.)

Per capita national expenditures in 1967 were $7.84.[14] To obtain the income for the Grand Traverse Region, estimated national per capita expenditures must be multiplied by the relevant population. For the most part people purchase these items in their own neighborhoods or, as is often the case for appliances, through the hospital where they are treated. Thus, while it is unlikely that tourists make a significant difference in the demand for glasses and appliances, it is likely that persons who regularly use the region's medical services purchase these items in the region. Approximately 90 percent of the people using the region's general hospitals come from the region itself or nearby counties. These people regard the region's facilities as their regular source of health care. Since most of this care is provided in Traverse City or Cadillac, and since these towns are the only important sources of eyeglasses and appliances, both with respect to the eight counties and the surrounding area, it is felt that the number of regular users would

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[14] Social Security Bulletin (January, 1969), p. 13.

provide a fair estimate of the population likely to purchase eyeglasses and appliances. The relevant population is 110,400.[15] Multiplying by per capita expenditures of $7.84 gives a total of $865,536 as an estimate of regional expenditures on eyeglasses and appliances and hence, the income of this component.

Nursing Homes

Throughout this section the term "nursing home" means a facility which is designated, staffed, and equipped for the accommodation of individuals not requiring hospital care, but needing nursing care and related medical services prescribed or performed under the direction of persons licensed to provide such care or services in accordance with Michigan laws.[16]

This definition summarily excludes very small rest homes and homes for the aged. Such facilities are usually unlicensed. No information is available about the occupancy or financing of these places. Accordingly no attempt will be made to include them in this analysis beyond the present recognition that some probably exist in the region. Their economic significance is slight, and their impact on this study would be, if anything, minimal.

Information about the economic status of nursing homes is sparse. In the past, nursing homes have occupied a small role in the total medical economy; consequently, there has been little demand for specific information. Furthermore, most nursing homes are operated for profit. Thus, administrators are reluctant or unable to reveal economic details.

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[15] Health Planning Council of Michigan, 1967 Patient Origin Study.

[16] U.S. Department of Health, Education, and Welfare, Nursing Home Standards Guide, Public Health Service Publication No. 827 (Washington: U.S. Government Printing Office, June, 1961; reprinted, April, 1963).

TABLE 36.--Average nursing home cost per patient day, by region, control, and size of nursing home, 1967

Type and size of nursing home	North Atlantic	North Central	S. Atlantic and S. Central	West	U.S. average
	Dollars				
Proprietary:					
Under 50 beds. . . .	9.82	8.86	8.13	10.45	9.42
50-99 beds	13.32	9.77	9.21	8.25	9.70
100 beds and over. .	15.11	10.36	10.47	13.19	12.16
Nonprofit:					
Under 50 beds. . . .	17.78	8.42	9.03	12.06	10.50
50-99 beds	17.01	9.07	9.26	11.58	10.17
100 beds and over. .	13.39	9.09	10.33	11.71	10.60

Source: Professional Nursing Homes, IX (December, 1967).

Nevertheless, some surveys are conducted and, sometimes specific information can be obtained from nursing homes. Estimates of the income of the region's nursing homes will be derived from both secondary and primary sources.

Up-to-date economic and other data taken from sample surveys of different classifications of nursing homes are available in annual guide issue of Professional Nursing Homes.[17] Table 36 shows the magazine's data on average costs per patient day for homes classified according to location, size, and control (proprietary or nonprofit).

Estimated incomes of the region's nursing homes can be obtained by multiplying known patient days by the average costs of appropriate North Central homes. The complete framework is laid out in Table 37.

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[17] Professional Nursing Homes (Minneapolis, Minnesota: The Miller Publishing Co.).

TABLE 37.--Estimated income of the Grand Traverse Region's nursing homes, 1967

County	Control	Number of beds	Patient days	Cost per patient day	Estimated income
		Number	Number	Dollars	Dollars
Antrim	Nonprofit	58	24,966	9.07	226,442.62
Benzie	Nonprofit	42	15,292	8.42	128,759.64
Grand Traverse	Nonprofit	90	32,781	19.07	675,210.63[a]
Grand Traverse	Proprietary	65	22,995	9.77	224,661.15
Kalkaska	Proprietary	12	2,880	8.86	25,517.80
Wexford	Proprietary	25	8,395	8.86	74,380.70
Wexford	Proprietary	64	22,227	9.77	217,158.79
Total		356	129,536	--	1,572,125.33

[a]Actual income.

Source: Michigan State Plan 1968-69; and Professional Nursing Homes, IX (December, 1967).

The total figure is the region's estimated nursing home income. One remarkable point about the income figures in Table 37 is the substantial difference between the cost per patient day in the Grand Traverse Medical Care Facility, the one home where actual figures are used, and the other homes for which estimates are used. Fortunately, the apparent conflict can be resolved without discarding the estimated figures.

The Grand Traverse Medical Care Facility (MCF) is an unusual example of a nursing home. In fact, it is better described as an extended care facility than as a nursing home. That is, in addition to providing the usual, and rather minimal, services of a nursing home, it is designed and operated to care for patients requiring an extended period of hospital care. In most communities such patients are treated and kept in a hospital, thereby incurring relatively high hospital costs. Nursing homes can provide hotel-type services without incurring many of the overhead costs of hospitals; consequently, their total costs per patient day are much lower than hospitals'.

The MCF provides, partially because of its access to the adjoining Munson Hospital, a large array of medical services. The costs of these services are borne by the facility's patients. But because the demand for these services is relatively low among extended care cases, the costs, when averaged out, are spread over a relatively large number of patients. The average cost per patient day is, therefore, low relative to a hospital, but high relative to other nursing homes which cannot provide these services. This is the reason for the high per patient day costs in the MCF, relative to the costs in other nursing homes.

The availability of additional services does not mean that "regular" patients, who do not require special attention, pay a higher bill than

they would elsewhere. But if they do need hospital-type treatment, they can receive it without the necessity for transportation to a different and maybe distant facility. This is a working example of what many researchers are calling for as a means for reducing hospital costs.

Expenses for Prepayment and Administration

Prepayment

Prepayment expenses are the difference between the earned premiums or subscription charges of health insurance organizations and their benefit expenditures. That is, they are the amounts retained by insurance organizations for operating expenses, additions to reserves, and profits. These are consumer expenditures and from the regional point of view can be assumed to represent the difference between what the population paid in premiums and received in benefits. Since no insurance companies are located in the Grand Traverse Region, the sum will represent a net outflow of money, or import of medical services.

Over 90 percent of Michigan residents under 65 years old carry hospital insurance, and over 80 percent also carry surgical insurance. One of the reasons for this relatively high incidence of coverage is the ability of rural people to participate in group insurance through their membership in farm organizations, particularly the Farm Bureau.

Because of the relatively low income status and rurality of the region, and despite previous remarks discounting the latter as a negative influence on health care in this region, the 90 percent average enrollment estimate may be high. A balancing factor, however, is the purchase of supplementary private insurance by people aged 65 and over. While no estimate of the number involved is available, it is probably sufficient to temper any excess in the 90 percent estimate.

The number of enrollees, estimated as 90 percent of the population under 65 years of age, is 76,860.[18] The average premium is estimated at $7.54 per enrollee; multiplying enrollees by the premium yields $579,500 as the estimated total prepayment expenditure.

Administration

In this study the administration component represents gross expenses of federally financed health programs. Nearly all of these expenses are incurred in the operation of the hospital and supplementary health insurance programs, Medicare and Medicaid. Expenditures can be represented by the premiums the region's population pays into the two programs.

Medicare premiums were previously estimated at $977,000 (p. 83). To obtain an estimate of Medicaid premiums in the region, it was assumed that the proportion of Medicaid to Medicare enrollees in the region was the same as it was in the state. Multiplying this proportion (94.08/100) by the number of Medicare enrollees (12,000) yields 11,383 Medicaid enrollees.[19] The Medicaid premium in 1967 was $36.00; multiplying by the number of enrollees ($36.0 x 11,383) gives $40,978 as the estimated total Medicaid premium paid by regional enrollees.

Total Expenditures

Estimated total insurance expenditures are the sum of private insurance prepayment expenses and public insurance premiums:

($579,500 + $977,000 + $40,978) = $1,597,478.

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[18] There were 85,400 people under 65 years old, Northwest Michigan Economic Development District, "Overall Economic Development Program," p. 29.

[19] Health Insurance Statistics, H-9 (Washington: U.S. Department of Health, Education, and Welfare, December 19, 1968).

This approach is unorthodox in that it considers net premiums for private insurance, but gross premiums for public insurance. However, there are two reasons for adopting it. The first is that it avoids cluttering the analysis by adding the private insurance sector as a source of funds, when in reality it is only an intermediary between consumers and producers. The second reason is that the approach lends itself to the analysis dealing with the interregional movement of funds. The approach is different from the one used by HEW, which only classifies administrative expenditures under administration (hence the title). To avoid confusion this health service component will henceforth be called Medical Insurance.

Government Public Health Activities

This component consists of the expenditures of state and local health departments and intergovernmental payments to the states and localities for public health activities.

In Michigan, public health services are organized on a district health department basis (this organization of public health services is distinct from the organization of hospital service areas described in chapter 4). Most rural districts include more than one county. The Michigan Department of Public Health maintains a headquarters in one of the counties and may have branch offices in some or all of the other counties. Financial transactions for the whole district are reported in the headquarters county. As a result, individual county expenditures are not readily available. Possible sources are state public health departments, or HEW estimates of per capita expenditures.

In this case, actual 1967 expenditures are available for the Grand Traverse District. The District is composed of Leelanau, Benzie, and

Grand Traverse Counties. Expenditures for the other five counties are not available. Nevertheless, since public health services are fairly evenly distributed throughout the region, there is unlikely to be substantial variation, in per capita expenditures, among districts. Hence, to estimate total public health expenditures, the Grand Traverse District's 1967 expenditures, less special expenditures for migrant workers, will be placed on a per capita basis and used as estimated per capita expenditures for the other five counties.

Public health expenditures were $115,477.80 in the Grand Traverse District in 1967.[20] The amount allocated to migrant expenses was $25,231.93. The difference, $90,245.87, divided by the three county population of 54,500, gives a per capita expenditure of approximately $1.66. Multiplying this by 43,000, the population of the other five counties, yields $71,380 as their estimated expenditure. Total regional public health expenditures are obtained by adding the estimated five county figure to the Grand Traverse District's gross figure (including migrant expenses). The resulting estimate is $186,857.80.

The advantage of this approach over using HEW national estimates is that the latter include many items of expense that are, generally, irrelevant in this type of analysis. Had HEW figures been used in this study, the estimated per capita expenditures would have been $3.20, nearly twice the $1.66 estimated with more regionally relevant data.[21]

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[20] "1967 Financial Report for the Grand Traverse District" (unpublished)

[21] To estimate rural single county or multicounty public health expenditures using HEW data, national per capita expenditures ($4.52 in 1967) are multiplied by the nonfederal, that is the state and local components of the source of funds (71 percent in 1967). Data are available annually in January editions of the Social Security Bulletin, published by the U.S. Department of Health, Education, and Welfare.

"Other" Health Services

Items of expenditure that could not be classified elsewhere are considered in the "other" health expenditures component. In deriving estimated expenditures for this sector, the Department of Health, Education, and Welfare includes such items as industrial in-plant services, school health services, medical activities in federal units other than hospitals, and private voluntary health agencies. With the exception of the last, these services are more likely to be associated with urban than with rural communities. Such is the case in the Grand Traverse Region, where the only relevant item is the activity of voluntary health agencies.

Voluntary Health Agencies

Since no better estimates of the income or expenditure of such agencies are available, the HEW estimate will be used. Fortunately, estimated expenditures on "other" health services are compiled in such a way that the components can be separated. Total expenditures were shown in Table 13, page 48. The amount attributable to philanthropic sources is the estimated expenditure by voluntary agencies.

On a per capita basis the amount is $1.66; multiplying by 97,500 (the region's population), $161,850 is the estimated expenditure of voluntary agencies. This is probably a high estimate for a rural area. Therefore, with the exception of expenditures of the Central Michigan Children's Clinic, the $161,850 will be regarded as the expenditure of voluntary agencies plus any other small health sectors which have not been accounted for.

Central Michigan Children's Clinic

There is one major facility which was not included in the previous sections. This is the Central Michigan Children's Clinic in Traverse City. The clinic is a separately financed extension of the James Decker Munson Memorial Hospital. The clinic provides specialized pediatric services to children from a wide area beyond the eight-county region. Financial information about the clinic is available, as is the case for all sections of the Munson Hospital, from audited annual financial statements.

The clinic's operating income for fiscal 1967 was $71,704.[22] Actual income was $157,382.50. Of this $85,678.56 went for construction which was completed before the calendar year. The operating income was made up of a philanthropic grant of $64,000, a salary grant from Munson Hospital of $6,000, a rent payment of $1,650 and miscellaneous income of $54.00. In distributing this income by source of funds, the first item is allocated to philanthropy and the last three items to "other private sources."

This is the only component for which it has been necessary to utilize the "other sources" category. The HEW classification of national expenditures also utilizes "other sources" only in respect to this component; thus, the approach used here is at least consistent with HEW's.

Total income for the "other" health services component is the sum of the clinic's income ($71,704) and the estimated income of voluntary agencies ($161,850): $233,554.

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[22]"Report on Examination, Central Michigan Children's Clinic of James Decker Munson Hospital, Traverse City, Michigan, June 30, 1967" (unpublished).

This completes the income analysis of the region's medical complex. Income results for the components analyzed in this chapter are summarized in Table 38.

Sources of Funds and Interregional Trade in the Nonhospital Medical Components

The objective of this section is to take the estimated incomes of the nonhospital components and to disaggregate them according to purchasing and regional sources, in much the same manner as was done for hospital services. Only here there are more sectors and less information with which to work. This should not detract from the development of useful estimates; it may, however, result in a more generally applicable approach than was used for hospitals.

Sources of Funds

The first step is to take the incomes from the previous sections of the chapter and, starting with the framework of Table 13, page 48, distribute them according to source of funds. The regionalization of these funds will then follow in a second, trade-oriented step.

Distribution Procedure

With a few exceptions, the distribution of the nonhospital components' incomes must be based on national distributions. The reason is that the type of detailed information that would be necessary for actual distribution is rarely available to a researcher in medical economics unless he is able to conduct extensive surveys. Exceptions in this case are the medical insurance, public health, "other" health, and the nursing home components.

TABLE 38.--Estimated income of the Grand Traverse Region's nonhospital medical services, 1967

Medical component	Income	Percentage
	1,000 dollars	Percent
Physicians' services	5,376.3	28.6
Osteopaths' services	1,854.6	9.9
Dentists' services	2,512.1	13.3
Other professional services	94.6	0.5
Retail drugs	4,525.5	24.0
Eyeglasses and appliances	865.6	4.6
Nursing homes	1,572.1	8.4
Insurance prepayment expenses	1,597.5	8.5
Government public health activities	186.9	1.0
Other health services	233.6	1.2
Total	18,818.8	100.0

These exceptions apart, this section really consists of a simple application of a national distribution to regional incomes. It will probably be illustrative, therefore, to present all the results now and to consider the exceptions subsequently. For nonhospital services, Table 39 shows the percentage distribution of national health expenditures by purchasing sources. Table 40 shows the percentage distribution, and Table 41 the actual distribution, of regional expenditures by purchasing sources, resulting from estimates based on both the national figures and analyses of the exceptions.

Exceptions

Modifications in the application of national percentages were used in the distribution for medical insurance, public health, "other" health, and nursing homes.

Medical insurance.--All medical insurance expenditures are assumed to be made by consumers. The 12.2 percent federal share shown in the national distribution relates to administrative expenditures of various federal programs, consequently it is irrelevant to this analysis.

Public health.--The federal share of the region's public health expenditure was available from county data.[23] State and local expenditures were, therefore, the residual between total expenditures and the federal share. In this case the distribution turned out to be the same as it would have been had no information been available, and the national distribution been applied directly.

"Other" health services.--The distribution for "other" health services was modified in order to incorporate information about the Children's

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[23] 1967 Michigan County Government Financial Report.

TABLE 39.--Percentage distribution of national nonhospital medical expenditures, by source of funds, 1967

Medical service	Source of funds						
	Private				Public		
	Total	Consumers	Philanthropy	Other	Total	Federal	State and local
	Percent				Percent		
Physicians	81.0	81.0	--	--	19.0	13.0	6.0
Osteopaths	81.0	81.0	--	--	19.0	13.0	6.0
Dentists	96.0	96.0	--	--	4.0	2.0	2.0
Other professionals	93.0	91.0	2.0	--	7.0	4.0	3.0
Drug and drug sundries	96.0	96.0	--	--	4.0	2.0	2.0
Eyeglasses and appliances	98.0	98.0	--	--	2.0	1.0	1.0
Nursing homes	36.0	35.0	1.0	--	64.0	42.0	22.0
Medical insurance	87.8	87.8	--	--	12.2	12.2	--
Public health	--	--	--	--	100.0	29.0	71.0
"Other" health	28.0	--	13.0	15.0	72.0	58.0	14.0
Total	67.2	64.9	1.5	0.8	32.8	21.0	11.8

TABLE 40.--Percentage distribution of the Grand Traverse Region's nonhospital medical expenditures, by source of funds, 1967

Medical service	Source of funds						
	Private				Public		
	Total	Consumers	Philanthropy	Other	Total	Federal	State and local
	Percent				Percent		
Physicians	81.0	81.0	--	--	19.0	13.0	6.0
Osteopaths	81.0	81.0	--	--	19.0	13.0	6.0
Dentists	96.0	96.0	--	--	4.0	2.0	2.0
Other professionals	93.0	91.0	2.0	--	7.0	4.0	3.0
Drugs and drug sundries	96.0	96.0	--	--	4.0	2.0	2.0
Eyeglasses and appliances	98.0	98.0	--	--	2.0	1.0	1.0
Nursing homes	27.4	25.1	2.3	--	72.6	57.3	15.3
Medical insurance	100.0	100.0	--	--	--	--	--
Public health	--	--	--	--	100.0	29.1	70.9
"Other" health	50.1	--	36.4	13.7	49.9	40.3	9.6
Total	61.1	59.5	1.5	0.1	38.9	14.4	24.5

TABLE 41.--Distribution of the Grand Traverse Region's nonhospital health expenditures, by source of funds, 1967

Service	Source of funds					
	Private				Public	
	Income	Consumers	Philanthropy	Other	Federal	State and local
	1,000 dollars					
Physicians	5,376.3	4,354.8	--	--	698.9	322.6
Osteopaths	1,854.6	1,502.2	--	--	241.1	111.3
Dentists	2,512.1	2,411.6	--	--	50.3	50.2
Other professionals	94.6	86.1	1.9	--	3.8	2.8
Drugs and drug sundries	4,525.5	4,344.5	--	--	90.5	90.5
Eyeglasses and appliances	865.6	848.2	--	--	8.7	8.7
Nursing homes	1,572.1	393.6	36.6	--	901.4	240.5
Medical insurance	1,597.5	1,597.5	--	--	--	--
Public health	186.9	--	--	--	54.4	132.5
"Other"	233.6	--	85.0	32.0	94.0	22.6
Total	18,818.8	15,538.5	123.5	32.0	2,143.1	981.7

Clinic. The clinic's income of $71,704 was distributed between consumers and philanthropy in the proportions given previously. The remaining $161,850 of "other" income, attributed to voluntary agencies, was distributed according to national figures.

Nursing homes.--Approximately 43 percent of the $1.5 million nursing home income is accounted for by the Grand Traverse Medical Care Facility. Financial reports indicate the sources of the facility's income. Unfortunately, because the facility is so unlike the region's other nursing homes, it would be inappropriate to use its distribution of funds to estimate their distributions. The nursing home sector was, therefore, divided into two sections: one which shows the actual distribution of the facility's funds and another which applies national estimates to the other homes. The derivation of the estimates by this method is shown in Table 42.

Structural exceptions.--Apart from the difference noted in defining the insurance component, the framework of Tables 40-41 differs from the usual HEW framework in that physicians and osteopaths are separated, whereas HEW classifies them jointly. The separation was made to assist future analyses relating to physicians' incomes.

Interregional Trade

Some interregional movement of funds is to be expected for all components of the health industry. For the most part, a regional industry's ability to serve more, or less, than the regional population determines whether it will be a net exporter, or importer, of medical services.

The Grand Traverse Region's hospitals have already been shown to be net exporters. To obtain estimates of the nonregional population expected to use the region's other medical services, consideration must be given to

TABLE 42.--Distribution of nursing homes' income by source of funds, the Grand Traverse Region, 1967[a]

Item	All nursing homes		Grand Traverse Medical Care Facility		Others	
	1,000 dollars	Percent	1,000 dollars	Percent	1,000 dollars	Percent
Total income	1,572.1	100.0	675.2	100.0	896.9	100.0
Source:						
Philanthropic	36.6	2.3	27.6	4.1	9.0	1.0
Federal	901.4	57.3	524.7	77.7	376.7	42.0
Consumers	393.6	25.0	79.7	11.8	313.9	35.0
State and local	240.5	15.3	43.2	6.4	197.3	22.0

[a]The source of Grand Traverse Medical Care Facility information was the annual report for the calendar year 1967. Two liberties were taken in transposing data from the report. Reported patient income of $73,709.81 was increased by the amount of co-insurance receipts: $6,031.42, and reported "other income" of $27,589.22 was attributed to philanthropic sources.

the inflow of visitors and to the accessibility of the region's facilities relative to those in adjacent counties.

In rural areas most medical services are located in the central town of a county or group of counties. Hence, except for occasional visits to village doctors and druggists, rural people must travel to town for medical attention. Towns with a wide array of medical services, such as Traverse City, can attract a population from a large area. The same is true, but to a lesser extent, of other hospital towns; the presence of a hospital attracts other medical services and hence a center grows to serve the surrounding area.

For many of the people in counties adjacent to the Grand Traverse Region, the nearest medical centers are located in the region. Therefore, a reasonable estimate of the total population using the region's medical services is the population that also uses the hospitals. This approach is likely to understate the population relevant to the drug trade because visitors undoubtedly make significant purchases of nonprescription medical sundries. Therefore, a separate estimate will be developed for the drug component.

The components may be divided into four groups:

1. Medical services, which include: the professional services, eyeglasses and appliances, nursing homes, and other health services;
2. retail drugs;
3. medical insurance; and
4. public health.

Interregional trade estimates will be developed for each group independently.

Medical Services

It is assumed that the population which normally uses the region's general hospitals comprises the market for the medical services group. The size of this population was 110,400 in 1967.[24] Since 97,500 people lived in the region, the balance, 12,900, makes up the nonregional market. The proportion of regional to nonregional sub-populations, 88.3 percent to 11.7 percent, will be used in estimating the appropriate division of funds between regional and nonregional sources.

Total expenditures for the medical services group is the sum of the components' incomes. This sum and the apportionment by purchasing sources have been calculated from Table 41, and are shown in Table 43. The regional apportionment in Table 43 is based on the population ratio and other assumptions. Philanthropic and "other" expenditures are assumed to originate solely within the region. Federal expenditures originate externally. State and local expenditures are divided by the population ratio; then in accordance with the criterion established for hospitals, half of the region's share is allocated to the counties and half to the state.

Nearly 30 percent of the group income originates from nonregional sources. As with hospitals, the largest nonregional contributor is the public sector, but in this case the federal government rather than the state government pays the largest share.

Retail Drugs

The retail drug group's income was estimated to be $4,525,500. Per capita sales were $46.15. It was suggested that the inflow of medical

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[24]See p. 106.

TABLE 43.--Regionalization of expenditures for the medical services group, 1967

Source	Expenditures[a]		Regional		Nonregional	
	1,000 dollars	Percent	1,000 dollars	Percent	1,000 dollars	Percent
Consumers[b]	9,596.5	100.0	8,473.7	88.3	1,122.8	11.7
Philanthropy	123.5	100.0	123.5	100.0	--	--
Other	32.0	100.0	32.0	100.0	--	--
Federal	1,998.2	100.0	--	--	1,998.2	100.0
State and local[c]	758.7	100.0	335.0	44.2	423.7	55.8
Total	12,508.9	100.0	8,964.2	71.7	3,544.7	28.3

[a]The medical services group is composed of: physicians, osteopaths, dentists, other professionals, nursing homes, eyeglasses and appliances, and "other" health services.

[b]Consumer expenditures are divided between regional and nonregional services in the proportions 88.3 percent and 11.7 percent.

[c]The division of state and local expenditures was calculated as follows: Total expenditures = $758.7

Unadjusted regional share = ($758.7 - $88.7) = $670.0

Unadjusted nonregional share = $\frac{(\$758.7 \times \$11.7)}{100}$ = $88.7

Adjusted regional share = $\frac{(\$670.0)}{2}$ = $335.0

Adjusted nonregional share = ($88.7 + $335.0) = $423.7.

and seasonal visitors accounted for the $18.60 difference between regional and national per capita sales.[25] Assuming this is true, and converting to percentages, 59.7 percent of sales were to the regional population and 40.3 percent to the nonregional population. Consumer expenditures are divided with these population ratios. There are no estimates for philanthropic or "other" sources. As with the previous group, federal expenditures are divided by the population ratio and then the regional share is reallocated to account for state payments. The calculations and resulting regionalization of drug expenditures are shown in Table 44.

Compared with previously discussed components, the regionalization of drug expenditures depends far less on the influence of public sources. Private consumers are by far the most important purchasers and, in the Grand Traverse Region, 38.7 percent of all drug purchases are estimated to have been made by nonregional consumers.

Medical Insurance

Estimated medical insurance expenditures are $1,597,500. The only source of this expenditure is the regional consumer; none is attributed to nonregional sources.

Public Health

County public health services are financed by federal, state, and local governments. Public health offices serve the populations from the county or district in which they are located. Consequently, there would usually be no nonregional population to consider in regionalizing expenditures.

The Grand Traverse situation is a little unusual in that there is a nonregional migrant population to consider. But because funds for

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[25] See p. 104.

TABLE 44.--Regionalization of drug expenditures, 1967

Source	Expenditures		Regional		Nonregional	
	1,000 dollars	Percent	1,000 dollars	Percent	1,000 dollars	Percent
Consumers	4,344.5	100.0	2,593.7	59.7	1,750.8	40.3
Federal	90.5	100.0	--	--	90.5	100.0
State and local[a]	90.5	100.0	27.0	29.8	63.5	70.2
Total	4,525.5	100.0	2,620.7	57.9	1,904.8	42.1

[a]The division of state and local expenditures was calculated as follows: Total expenditures = $90.5

Unadjusted regional share = $\frac{(\$90.5 \times \$59.7)}{100}$ = $54.0

Unadjusted nonregional share = ($90.5 - $54.0) = $36.5

Adjusted regional share = $\frac{(\$54.0)}{2}$ = $27.0

Adjusted nonregional share = ($36.5 + $27.0) = $63.5.

migrant workers' public health services are provided by the federal government, it is a simple matter to allocate migrant expenses to a nonregional source.

State and local expenditures, all of which are assumed to be spent on the resident population, can, in accordance with the criterion previously developed, be evenly divided between the state and counties; the former being a nonregional source and the latter a regional source.

The regionalization of the estimated $186,900 public health expenditures is shown in Table 45.

Consolidation of Results for the Producing and Consuming Sectors

Results from this and the previous chapters can now be assembled. This is done: first, to demonstrate the income structure of the medical components individually, as entities within the productive complex, and collectively, as the complex itself; and secondly, with respect to the consuming sector, to show how expenditures are divided among the various consuming sources themselves and the regions in which they are located.

The results are presented in tables that summarize previously reported income and expenditure data. Table 46 shows the distribution of regional and national health expenditures for 1967. Except for some reordering of services, separation of hospitals by type (instead of control) and separation of physicians and osteopaths, the classification of medical services is similar to the standard HEW classification.[26]

The distribution of regional expenditures follows the pattern of the national distribution. Three components, hospitals, physicians and

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[26]Standard HEW classification refers to the classification of services and sources shown in Table 13, p. 48.

TABLE 45.--Regionalization of public health service expenditures, 1967

Source	Expenditures		Regional		Nonregional	
	1,000 dollars	Percent	1,000 dollars	Percent	1,000 dollars	Percent
Federal.	54.4	100.0	--	--	54.4	100.0
State and local.	132.5	100.0	66.2	50.0	66.3	50.0
Total.	186.9	100.0	66.2	35.4	120.7	64.6

TABLE 46.--Percentage distribution of national and Grand Traverse Region health expenditures, by service, 1967

Item	National	Regional
	Percent	Percent
Hospitals	38.3	46.3
Nursing homes	4.0	4.5
Physicians and osteopaths	21.7	20.6
Dentists	6.8	7.2
Other professionals	3.0	0.3
Drugs and drug sundries	11.9	12.9
Eyeglasses and appliances	3.4	2.5
Medical insurance	3.8	4.5
Public health service	1.9	0.5
"Other" health services	5.2	0.7
Total	100.0	100.0

osteopaths, and drugs accounted for more than 70 percent of both national and regional expenditures. The concentration of hospital facilities in the region is reflected by the 46.3 percent of expenditures going for hospital care compared with 38.3 percent nationally. Other major expenditure items, doctors and drugs, accounted for approximately the same percentages of expenditures at the regional and national levels. The rather large difference between national and regional percentages spent on "other" health services can best be explained by the observation that the regional estimate was based on more factual information than the national estimate, which is for the most part, of a residual nature.

Table 46 includes all expenditures for health services produced in the region, plus medical insurance expenditures. Essentially the latter are spent outside the region and then rechanneled, by third parties, to regional services. In this sense, inclusion of the item in the total figure involves double counting. However, since the insurance component is not part of the region's industry, its income is not regional income; the component must, therefore, be deleted in considering the industry's income. Also, the standard HEW distribution by consuming source is not designed to differentiate regionally. These reservations are accounted for in Tables 47 and 48, which show the actual and percentage distribution of the regional medical income.

One of the main points brought out in these tables is the relative size of the nonregional contribution to the industry's income. Because of the psychiatric hospital, the state and local governments contribute the largest share of outside income. Removal of data for this facility, as in Tables 47 and 48, shifts the emphasis to the federal government as the major source of external income. This would have been the case had this analysis been conducted for any prior year. The first full year

TABLE 47.--The Grand Traverse Region's medical industry income, by service, region, and source of funds, 1967

Medical services	Regional source of funds				
	Total	Consumers	Philanthropy	Other	Local government
	1,000 dollars				
General hospitals	4,754.7	4,280.5	272.8	--	201.4
Psychiatric hospital	285.5	85.4	--	--	200.4
Medical services group[a]	8,964.2	8,473.7	123.5	32.0	335.0
Drugs and drug sundries	2,260.7	2,593.7	--	--	27.0
Public health	66.2	--	--	--	66.2
Total	16,691.6	15,433.3	396.3	32.0	829.0
All services except psychiatric hospital	16,405.8	15,347.9	396.3	32.0	628.6
	Nonregional source of funds				
	Total	Consumers	Philanthropy	Federal government	State & local government
	1,000 dollars				
General hospitals	3,947.3	1,059.4	--	2,576.3	316.6
Psychiatric hospital	7,269.2	758.8	89.9	33.0	6,387.5
Medical services group[a]	3,544.7	1,122.8	--	1,998.2	423.7
Drugs and drug sundries	1,904.8	1,750.8	--	90.5	63.5
Public health	120.7	--	--	54.4	66.3
Total	16,786.7	4,691.8	89.9	4,752.4	7,252.6
All services except psychiatric hospital	9,517.5	3,933.0	--	4,719.4	865.1

[a]Includes professional services, eyeglasses and appliances, nursing homes, and "other" health services.

TABLE 48.--Percentage distribution of the Grand Traverse Region's medical industry income, by service, region, and source of funds, 1967

Medical services	Regional source of funds				
	Percentage of total	Consumers	Philanthropy	Other	Local government
General hospitals	54.6	49.2	3.1	--	2.3
Psychiatric hospital	3.8	1.1	--	--	0.7
Medical services group[a]	71.7	67.7	1.0	0.3	2.7
Drugs and drug sundries	57.9	57.3	--	--	0.6
Public health	35.4	--	--	--	35.4
Total	49.9	46.1	1.2	0.1	2.5
All services except psychiatric hospital	63.3	59.2	1.6	0.1	2.4
	Nonregional sources of funds				
	Percentage of total	Consumers	Philanthropy	Federal government	State & local government
General hospitals	45.4	12.2	--	29.6	3.6
Psychiatric hospital	96.2	10.0	1.2	0.4	84.6
Medical services group[a]	28.3	9.0	--	16.0	3.3
Drugs and drug sundries	42.1	38.7	--	2.0	1.4
Public health	64.6	--	--	29.1	35.5
Total	50.1	14.0	0.2	14.2	21.7
All services except psychiatric hospital	36.7	15.2	--	18.2	3.3

[a]Includes professional services, eyeglasses and appliances, nursing homes, and "other" health services.

that federal insurance programs were operating was 1967. Total income would have been less in earlier years and state and local governments would have been paying more.

Importance of External Financing

The shift in external financing towards the federal government has particular significance with respect to economic development of rural and low-income areas which have or are planning a medical services industry. For one thing, these federal funds are likely to be under-compensated in terms of tax revenues collected from rural or poor areas. For another, to the extent that a medical industry serves a population beyond the county or region where it is located, it can attract public and private funds on behalf of the nonregional population. The Grand Traverse Region apparently enjoys the best of both these situations.

In Table 49 medical income derived from nonregional sources has been isolated and called exports. Expenditures by the regional population for services purchased outside the region, which can be called imports, are assumed to be included under insurance.

The region earned a net trade surplus of nearly $15 million in 1967. This was approximately 44.0 percent of the region's medical income. The gross trade surplus, however, was nearly $17 million or, close to 50.0 percent of the medical income. From the developmental point of view, the latter is the relevant surplus because export payments constitute additions to a region's income and can, through a multiplier effect, create even more income. Imported medical services on the other hand, promote leakages from the regional income stream. One such leakage, insurance payments, has already been discussed. There are, however, others which are likely to cause a greater outflow of expenditures. These are

TABLE 49.--Exports and imports of medical services, by service and source of funds, Grand Traverse Region, 1967

Medical service	Exports[a]				Consumer imports[b]
	Total	Consumers	Philanthropy	Government	Consumers
	1,000 dollars				
Hospitals	11,216.5	1,818.2	89.9	9,308.4	--
Medical services group	3,544.7	1,122.8	--	2,421.9	--
Drugs and drug sundries	1,904.8	1,750.8	--	154.0	--
Net insurance	--	--	--	--	1,972.4
Public health	120.7	--	--	120.7	--
Total	16,786.7	4,691.8	89.9	12,005.0	1,972.4
Total exports less total imports	14,814.3				

[a]Regional expenditures by nonregional sources.

[b]Nonregional expenditures by regional consumers.

purchases by the health care producers for nonregionally produced goods and services. The greatest part of the development impact of a region's medical industry is probably its effect on local employment; the industry is highly labor intensive with payroll expenses accounting for approximately 70 percent of total expenditures. The total impact, however, is likely to be lessened by substantial outlays for imported goods and services. Furthermore, if excessive profits are earned by the producers of some imports, the cost to a region of maintaining its medical structure may also be excessive and the development impact moderated. It is not an objective of this study to pursue the relationship between employment and development at great length, but it is an objective to ascertain the costs ascribable to excess profits. Progress can be made, towards isolating expenditures giving rise to the latter, by completing the analysis of the intersectoral and interregional flows of medical incomes and expenditures. The last stage in the analysis, prior to assembling the parts of the regional medical structure, deals with the input supplies sector.

CHAPTER VII

INCOME AND EXPENDITURE ACCOUNTS-- THE INPUT SUPPLIES SECTOR

So far, the producing and consuming sectors have been considered. The income of each producer of medical services has been estimated and distributed according to its sources. This chapter examines the relationship between the producing sector and the input supplies sector. It deals with upon what and where the producing sector spends income received from the consuming sector. That is, this chapter analyzes the distribution of each medical producer's income among the various inputs it purchases and regionalizes this distribution according to whether the inputs are purchased within or without the region. In this process, consideration will only be given to one stage of spending beyond the producer.

Distribution of Medical Incomes by Input and Regional Classification

Rather than the traditional land, labor, and capital classification, inputs will be classified in a way that will best serve the specific ends of this chapter. These are to estimate the distribution of the medical incomes among professional and nonprofessional labor and medical and nonmedical supplies, and regional and nonregional expenditures. All labor is assumed to live in the region; therefore, all labor expenditures are regarded as regional. To aid in identifying the division of expenditures among different employment categories, labor is divided into three classes:

self-employed professionals, professional employees, and nonprofessional employees. Physicians, osteopaths, dentists and other professionals fall in the first class; examples of professional employees are registered nurses, medical technologists, X-ray technicians, and therapists; examples of nonprofessional employees are practical nurses, housekeepers, food service workers, clerical workers, and maintenance staffs.

This labor classification is mainly necessary for the major health facilities: hospitals and nursing homes. Some crossover and arbitrariness may be involved in the classes; it is, however, based on U.S. Department of Labor classification.[1]

The balance of producers' incomes after deducting net income and labor expenditures are assumed to be spent for nonlabor inputs. These inputs will probably account for between 30 and 40 percent of expenditures; no one input is likely to account for a substantial proportion of the expenditures. Nevertheless, where possible, inputs will be classified according to whether they are purchased from regional or nonregional sources, and whether they are for medical or nonmedical inputs.

Each component of the Grand Traverse Region's medical industry is considered individually. Labor expenditures are estimated first and categorized according to the classification outlined above. Income remaining after labor expenses are deducted will be assumed to be spent on other inputs and will be allocated both regionally and by type of input.

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[1]U.S. Department of Labor, Industry Wage Survey, Hospitals, July 1966, Bureau of Labor Statistics, Bulletin No. 1553 (Washington: U.S. Government Printing Office, June, 1967).

The availability of data for this type of analysis is sporadic. Though some specific regional information is available, reliance will be placed mainly on tax returns and other nationally available reports.

General Hospitals

General hospital expenditures in the region in 1967 were $8,702,000.[2] Of this, $5,371,000 were payroll expenditures and $3,331,000 were non-payroll expenditures.

Labor Inputs

A hospital's labor force can generally be divided into professionals and nonprofessionals. Examples of the former are registered nurses, interns, medical technicians, and administrators; examples of the latter are practical nurses, housekeepers, and maintenance and clerical workers.

According to data in Table 19, page 67, there were 1,257 hospital employees in the region in 1967. Total payroll expenditures were $5,371,000. Using the professional/nonprofessional classification of employees and the average salaries at one of the region's hospitals as proxies for all of the hospitals, it was estimated that 685 of the 1,257 employees were professionals and 572 were nonprofessionals.[3] Average professionals' salaries were estimated at $5,000 and nonprofessional salaries at $3,402.[4] Total professional salaries were $3,425,000 and nonprofessional salaries were $1,946,000.

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[2]Table 19, p. 67.

[3]Klarman, The Economics of Health and Medical Care, pp. 227-254.

[4]These estimates compared closely with estimates for the North Central Region. U.S. Department of Labor, Industry Wage Survey.

Other Inputs

Nonpayroll expenditures were estimated at $3,331,000, or 38.3 percent of total expenditures. Hospital records indicate than an approximate breakdown of nonpayroll expenditures in percentages of total expenditures is: medical supplies and services, 18.2 percent; and nonmedical supplies and services, 20.1 percent.

These expenditures can be further divided so that they may be considered from the perspective of interregional trade.

Purchases of medical inputs, 18.2 percent of total expenditures, are divided between regional and nonregional sources. Hospital records indicate that special services, such as professional consultation, may account for as much as half the expenditures on medical supplies and services. The location of highly specialized medical personnel within the region can be assumed virtually to eliminate the need for nonregional expenditures for special services. Medical supplies such as hospital equipment and pharmaceuticals are purchased largely from nonregional sources. Accordingly, it is assumed that these expenditures are evenly divided between regional and nonregional destinations. The regional half consists of special services and a small amount of supplies, the nonregional half consists solely of medical supplies.

Nonmedical expenditures (20.1 percent) are incurred largely for housekeeping supplies (12.1 percent of total expenditures) and nonoperating services (8.0 percent of total expenditures). For the most part the former are generally available goods such as food and fuel, which can be purchased locally; the latter consists of items such as social security which must be purchased nonlocally and depreciation payments which may or may not be made locally. Accordingly, it will be assumed

that housekeeping supplies are regionally purchased while nonoperating expenditures are evenly divided between regional and nonregional purchases.

Summary

The breakdown of nonpayroll expenditures suggested in the preceding paragraphs and of payroll expenditures given earlier are incorporated in Table 50. The table also shows the estimated regional distribution of the general hospitals' expenditures.

According to these estimates, regional expenditures--consisting of labor and other regional inputs--accounted for 86.9 percent of all expenditures. This outcome is effected mainly by the large proportion of hospital expenditures accounted for by payrolls for regional residents, and to a lesser degree by expenditures for nonmedical, household-type goods purchased within the region.

The framework underlying the distribution of general hospital expenditures will be used for the other health services. Modifications in the framework, such as the inclusion of self-employed professionals, will be made for individual services as necessary.

Psychiatric Hospital

Financial records for the psychiatric hospital are published on a fiscal year basis. The income expenditure accounts for 1967 and 1968 have been converted to a calendar year basis to derive estimates for 1967. These accounts have been examined and, following the procedure developed above and applied to general hospitals, expenditures have been distributed according to an input and regional classification. The results of this distribution are shown in Table 51.

TABLE 50.--Distribution of the Grand Traverse Region's general hospital expenditures, by input and region, 1967

Input classification	Expenditure	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor:		
Professional	3,425	39.3
Nonprofessional	1,946	22.4
Subtotal	5,371	61.7
Other inputs:		
Regional--		
Medical	792	9.1
Nonmedical	1,399	16.1
Nonregional--		
Medical	792	9.1
Nonmedical	348	4.0
Subtotal	3,331	38.3
Total	8,702	100.0

TABLE 51.--Distribution of the Traverse City State Hospital's expenditures, by input and region, 1967

Input classification	Expenditure	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor:		
Professional	1,770	23.3
Nonprofessional	4,319	57.2
Subtotal	6,089	80.5
Other inputs:		
Regional--		
Medical	117	1.6
Nonmedical	865	11.4
Nonregional--		
Medical	235	3.1
Nonmedical	249	3.4
Subtotal	1,466	19.5
Total	7,555	100.0

There were 905 employees at the Traverse City State Hospital in 1967. In 1965, the last year for which information about the different types of employees were available, there were 850 employees. Of these, 106 were professionals, 461 were psychiatric aides, and 283 can be assumed to have been other nonprofessionals. Thus, 744, or 87.5 percent, were nonprofessionals and 106, or 12.5 percent, were professionals.[5] Assuming the same proportions held in 1967, it is estimated that there were 791 nonprofessionals and 113 professional employees. The average wage in 1967 for nonprofessionals, obtained by adjusting the average 1966 nonprofessional wage in Detroit's state and local government hospitals, was estimated to be $5,460; multiplying by 791, the number of nonprofessionals, yields $4,319,000 as the nonprofessional payroll.[6] The professional payroll was estimated as the difference between the total and nonprofessional payrolls. The difference, $1,770,000, when divided by 113, the number of professional employees, yields an average professional wage of $15,664.

The large differenees between both professional and nonprofessional average wages in the region's psychiatric hospital and the general hospitals are explainable first, by the fact that national average earnings for most occupations are higher in psychiatric and government hospitals than in private hospitals and secondly, by the higher ratio of professional to nonprofessional employees in general hospitals. The fact that

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[5]The 1965 data is based on: Hospitals, Journal of the American Hospital Association (August, 1967), and State of Michigan, Michigan State Plan for Construction of Community Mental Health Facilities, 1965-66 (Lansing, Michigan: Michigan Department of Public and Mental Health, 1966).

[6]Ibid., p. 6.

a high proportion of these professionals are nurses effectively reduces the average professional wage in general hospitals relative to that in psychiatric hospitals.

Other Inputs

Nonlabor expenditures are largely incurred in the areas of plant maintenance, food and housekeeping supplies, medical supplies, and employee fringe items.

Most purchases of medical supplies are for special equipment and drugs used in the treatment of psychiatric patients. These, for the most part, are provided by nonregional sources. Everyday items, however, such as common drugs and medical sundries, are purchased locally. Assuming that, in fact, a third of the hospital's medical supplies are purchased locally and two-thirds nonlocally, the $352,000 spent on medical supplies can be divided into regional expenditures of $117,000 and nonregional expenditures of $235,000.

Other items, food excluded, have been divided between regional and nonregional expenditures. Food expenditures, the major nonpayroll item, were $516,000 and are assumed to be regional expenditures.

Nursing Homes

The 1967 income of the region's six nursing homes was estimated at $1,572,125. In the following analysis of input expenditures, the homes are treated as a group. Data from current national nursing home surveys and from the Annual Report of the Grand Traverse Medical Care Facility (MCF) have been combined in order to develop employment and other input estimates. The estimated distribution of expenditures is shown in Table 52.

TABLE 52.--Distribution of the Grand Traverse Region's nursing home expenditures, by input and region, 1967

Input classification	Expenditure	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor:		
Self-employed professionals	36.6	2.3
Professional	264.0	16.8
Nonprofessional	805.0	51.2
Subtotal	1,105.6	70.3
Other inputs:		
Regional--		
Medical	78.6	5.0
Nonmedical	276.7	17.6
Nonregional--		
Medical	6.3	0.4
Nonmedical	104.9	6.7
Subtotal	466.5	29.7
Total	1,572.1	100.0

Labor Inputs

Four nursing homes were proprietary. It is assumed that each was operated by a self-employed professional. Net income on proprietary earnings, estimated by multiplying the number of patient days in each home by the difference in estimated costs per day between proprietary and nonproprietary homes in the same size bracket, was $36,600.

It was estimated that there were 306 other employees: 55 professionals and 251 nonprofessionals. These figures were obtained by adding the known employment for the MCF and the estimated employment for the other nursing homes. The latter estimates and the division between professionals and nonprofessionals were based on 1967 statistics relating to the types and number of personnel in varying sizes of nursing homes in the United States.[7] Labor accounted for 68 percent of total expenditures in the MCF; the same rate was assumed to apply to all the nursing homes in the region.[8] Average professional salaries were estimated at $4,800 and nonprofessional salaries at $3,200. These averages and the ratio of professionals to nonprofessionals are lower than in the general hospitals and reflect the need for less specialized staffs in nursing homes.

Other Inputs

As with employment, the distribution of expenditures among non-labor inputs was based on MCF and Professional Nursing Homes data. Purchased medical supplies are largely pharmaceuticals and invalid equipment. These tend to be purchased in relatively small quantities and for

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[7] Professional Nursing Homes, 1968 Market Data and Planning Guide (Minneapolis, Minnesota: The Miller Publishing Co., 1968).

[8] This rate is also consistent with estimates for nursing homes reported in Professional Nursing Homes, 1968 Market Data and Planning Guide.

the most part, are obtained locally. Administrative and domestic needs account for most nonmedical expenditures. The regionalization was based on an assumed distribution of the MCF's expenditures.

Professional Services

Data limitations restrict the possibility of developing complete individual breakdowns of the expenditures of the professional medical services. Physicians, osteopaths, dentists, and other professional services are, therefore, analyzed as a group.

U.S. Treasury Department data are used for the initial classification by type of expenditure, but subsequent classifications by nonlabor input and region of purchase will be based on the assumption that the proportionat distribution is the same for each service. The estimated distribution of 1967 expenditures according to the Treasury Department classification is shown in Table 53. Where necessary, Treasury figures have been adjusted to account for differences between the Treasury's national estimates and this study's regional estimates. For the remainder of this section the individual services will be analyzed as a group; hence the relevant figures are in the "total" column in Table 53.

Labor Inputs

Three levels of labor inputs are considered in analyzing professional services: self-employed professionals, professionals, and nonprofessionals.

The income of self-employed professionals is shown as net income in Table 53. The estimated number of self-employed professionals in the region was 177, so the average net income was approximately $31,500 ($5,566,300 ÷ 177).[9]

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[9]There were 92 physicians, 27 osteopaths, 41 dentists, 15 nurses, 1 chiropractor, and 1 dental laboratory proprietor.

TABLE 53.--Distribution of expenditures for the Grand Traverse Region's professional medical services, 1967

Item	Professional service				
	Total	Physicians	Osteopaths	Dentists	Other prof. services
	1,000 dollars				
Payroll[a]	1,164.4	596.8	205.9	354.2	7.5
Purchases of medical supplies	540.9	161.3	137.2	231.1	11.3
Other business expenses	2,566.0	1,392.4	547.2	613.4	13.0
Net income[b]	5,566.3	3,225.8	964.3	313.4	62.8
Business income	9,837.6	5,376.3	1,854.6	2,512.1	94.6

[a]Payroll expenditures for hired professional and nonprofessional help.

[b]Net income for self-employed professionals.

Calculated from: U.S. Department of the Treasury, "Preliminary Statistics of Income", 1966 and 1967.

Payroll expenditures shown in the table are assumed to have been paid to hired professional and nonprofessional help. The former would largely be accounted for by registered nurses working in medical practitioners' offices and the latter by nonregistered nurses, office staff, and janitorial workers.

In 1965, 37 registered nurses were employed in offices in the region.[10] Assuming that the number had increased to 40 by 1967, and that the average salary was $5,000, the same as the average for professionals in general hospitals, professional salaries were $200,000 (Table 54).

Deducting professional salaries from the total payroll ($1,164,400 - $200,000) leaves $964,400 as the estimated earnings of nonprofessionals. Based on the average $3,400 wage of nonprofessionals in general hospitals, it is estimated that the number of nonprofessionals was approximately 283.[11]

Other Inputs

Nonlabor expenditures were $3,106,900. Apart from medical supplies purchased and re-sold to patients, the bulk of professional expenditures are for nonmedical services, such as rent, interest, and taxes. It is

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[10] 1964-65 Annual Report of the Michigan Board of Nursing, pp. 11-12.

[11] Calculated by dividing estimated nonprofessional payroll expenses ($964,400) by the average nonprofessional wage ($3,400). Surveys indicate that physicians' office salaries tend to stay in line with hospital salaries, and that, in 1966, midwestern salaries for inexperienced office help ranged from $2,500 to $3,000. Medical Economics (December 12, 1966), p. 79.

assumed that all medical supplies are purchased from nonregional sources and that this expenditure is represented in Table 53 by the "cost of goods sold" -- $540,900. Other business expenses in Table 53, $2,566,000, are assumed evenly divided between regional and nonregional items.

Summary

Results for the distribution of professional services' income by type of input and region are summarized in Table 54.

Drug Stores

The value placed on retail drug store sales of prescription drugs and sundry medical products was $4,525,500.[12] Estimates of the proportionate allocation of these sales among major expenditure items are shown in Table 55.

Labor Inputs

The region's drug stores, approximately 40 in number, are proprietarily operated and it is assumed that the proprietors are self-employed medical professionals. Consequently, as in the analysis of professional services, net income is regarded as the labor expense of self-employed professionals. Estimated total net income is $624,522; net income per store, therefore, assuming 40 stores and one proprietor per store is $15,613.[13]

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[12] See Table 35, p. 103. The sales total was obtained by adding prescription drug, medical sundry, and proprietary drug sales, and rounding to the nearest $100.

[13] The assumptions of sole proprietorship and medical professionalism are made on the expectation that the "average" owners of small town drug stores are also pharmacists. This excludes the possibility that some stores may actually be associated with chain operations.

TABLE 54.--Distribution of the Grand Traverse Region's professional service expenditures, by input and region, 1967

Input classification	Expenditures	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor inputs:		
Self-employed professionals. . .	5,566.3	56.6
Professionals.	200.0	2.0
Nonprofessionals	964.4	9.8
Subtotal	6,730.7	68.4
Nonlabor inputs:		
Regional--		
Medical.	--	--
Nonmedical	1,283.0	13.0
Nonregional--		
Medical.	540.9	5.5
Nonmedical	1,283.0	13.0
Subtotal	3,106.9	31.5
Total.	9,837.6	100.0[a]

[a]Detail does not add to 100 percent due to rounding.

TABLE 55.--Distribution of the Grand Traverse Region's drug store income, by input and region, 1967

Item	Amount	Percentage of total
	1,000 dollars	Percent
Business receipts.	4,525.5	100.0
Costs of goods sold.	2,652.0	58.6
Salaries and wages	606.4	13.4
Other business expenditures	642.6	14.2
Net income	624.5	13.8

Sources: U.S. Department of the Treasury, Statistics of Income, 1966 (Washington: U.S. Government Printing Office, 1967); U.S., Congress, Senate, Subcommittee on Monopoly of the Select Committee on Small Business, Competitive Problems in the Drug Industry, part 5, 90th Cong., December 14 and 19, 1967, and January 18, 19, and 25, 1968, p. 1744; Report of the Commission on the Cost of Medical Care, I (Chicago: American Medical Association, 1966), 35.

The estimates were derived by adjusting the Treasury Department's distribution of drug store earnings, in which nonmedical items are included, to reflect returns and expenditures incurred solely in the sale of medical items.

Payroll expenses for professional and nonprofessional employees are $606,420, or $15,160 on a per store basis. The average pay for employees in Munson Hospital's pharmacy was $5,043 in 1967.[14] If the same rate is appropriate for drug stores, the number of employees is approximately three per store, or 120 altogether. These 120 employees are divided on the assumption of one professional and two nonprofessionals per store.[15] Using the average salary for medical technologists in the Detroit area in 1966 as an estimate, professional salaries were $6,000 per employee, or $240,000 in total.[16] Nonprofessional payroll expenses, calculated as the difference between total payroll and professional salaries were $366,400 or $4,600 per employee.

Other Inputs

Merchandise purchased for re-sale accounts for 58.6 percent of drug store expenditures. It is assumed that these expenditures are nonregional and made for medical supplies.[17] "Other business expenditures"--14.2 percent of total income--are assumed to be made for nonmedical goods and services and to be evenly divided between regional and nonregional purchases.

Summary

Results for the distribution of drug store purchases by type of input and region are summarized in Table 56.

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[14]"Report on Examination," p. 12.

[15]U.S. Department of Labor, Industry Wage Survey, p. 37.

[16]The number of employees is assumed to represent the use of full-time equivalents in the sale of medical items.

[17]Items such as packaging materials are assumed to be included in "other business expenditures."

TABLE 56.--Distribution of the Grand Traverse Region's drug store expenditures, by input and region, 1967

Input classification	Expenditure	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor:		
Self-employed professionals. . .	624.5	13.8
Professionals.	240.0	5.3
Nonprofessionals	366.4	8.1
Subtotal	1,230.9	27.2
Other inputs:		
Regional--		
Medical.	--	--
Nonmedical	321.3	7.1
Nonregional--		
Medical.	2,652.0	58.6
Nonmedical	321.3	7.1
Subtotal	3,294.6	72.8
Total.	4,525.5	100.0

Eyeglass and Appliance Stores

Sales of eyeglass and medical appliances are included in U.S. Treasury statistics for retail drug and proprietary stores. In contrast to the analysis of drug stores, there is a lack of data which can be used to modify these statistics. It will be assumed, therefore, that the regional distribution of eyeglass and appliance store incomes among major items of expenditure is the same as the United States distribution of drug and proprietary store incomes. This distribution, applied to an estimated regional income of $865,600, is shown in Table 57.

Classification of Expenditures

There are approximately six retailers of eyeglasses and appliances in the region. The redistribution of their expenditures by region and input is assumed similar to that previously used in the analysis of drug stores. That is, the cost of goods is a nonregional expenditure on medical inputs; and salaries and wages and net income are regional expenditures for professional, nonprofessional, and self-employed professional labor. Also, there are, in addition to the owner who is assumed to be a self-employed professional, three employees per store: one professional earning $6,000, and two nonprofessionals earning approximately $4,600 each. "Other business expenditures" are evenly divided between regional and nonregional purchases of nonmedical supplies. The results are summarized in Table 58.

Public Health Services

Income and expenditures of the region's public health services were estimated at $186,900. Financial and employment data are available for

TABLE 57.--Distribution of the Grand Traverse Region's eyeglass and appliance store incomes, by type of expenditure, 1967

Item	Amount	Percentage[a] of total
	1,000 dollars	Percent
Business receipts.	865.6	100.0
Cost of goods sold	582.5	67.3
Salaries and wages	91.7	10.6
Other business expenditures	97.0	11.2
Net income	94.4	10.9

[a]The percentage distribution was derived from U.S. Department of the Treasury, Statistics of Income, 1966 (Washington: U.S. Government Printing Office, 1967).

TABLE 58.--Distribution of the Grand Traverse Region's eyeglass and appliance store expenditures, by input and region, 1967

Input classification	Expenditure	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor:		
Self-employed professionals. . .	94.4	10.9
Professionals.	36.0	4.2
Nonprofessionals	55.7	6.4
Subtotal	186.1	21.5
Other inputs:		
Regional--		
Medical.	--	--
Nonmedical	48.5	5.6
Nonregional--		
Medical.	582.5	67.3
Nonmedical	48.5	5.6
Subtotal	679.5	78.5
Total.	865.6	100.0

the Grand Traverse health department.[18] On the assumption of a similar pattern of expenditures, the distribution pertinent to the Grand Traverse department, which accounted for more than half the region's total public health income, is used as a framework for the region.

Classification of Expenditures

Over 70 percent of expenditures were for labor. Employment data show that there were approximately 20 professional and 12 nonprofessional public health employees in the region. Average professional salaries were $5,000; nonprofessionals earned approximately $3,000.[19] Other expenditures were largely for travel, supplies, consultations, rent, and employee fringe items. Regional medical expenditures included all clearly medical expenditures and half the expenditures on supplies. Regional nonmedical expenditures are rent, travel, and the other half of the expenditures on supplies. Nonregional expenditures are all nonmedical and are composed of employee fringe items such as social security taxes.

In Table 59, the region's public health income is distributed along the lines previously suggested. The percentages in the right hand column are derived from the Grand Traverse health district's financial statements.

Other Health Services

Approximately one third of the estimated miscellaneous sector income of $233,600 was attributed to the Central Michigan Children's Clinic. Information about the clinic's expenditures is available but there is no useful information about the other services. It is assumed, therefore,

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[18] Grand Traverse District Health Department, "Financial Statement," January, 1968 (unpublished).

[19] Information in a letter to the author from J. Cinco, Director of District Health Department No. 1, Lake City, Michigan, July 27, 1967.

TABLE 59.--Distribution of the Grand Traverse Region's public health services expenditures, by input and region, 1967

Input classification	Expenditure	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor:		
Professionals	101.9	54.5
Nonprofessionals	34.2	18.3
Subtotal	136.1	72.8
Other inputs:		
Regional--		
Medical	12.3	6.6
Nonmedical	22.2	11.9
Nonregional--		
Medical	--	--
Nonmedical	16.3	8.7
Subtotal	50.8	27.2
Total	186.9	100.0

that the distribution of the clinic's and miscellaneous services' incomes are the same and that an approximation of the correct income distribution can be obtained by prorating the clinic's distribution to the total income of this component. Results of this procedure are shown in Table 60.

Classification of Expenditures

The estimated number of employees was 15 professionals and 11 nonprofessionals; average payroll expenses were $6,100 for professionals and $4,500 for nonprofessionals. These figures were obtained by projecting the clinic's employment and payroll structure to cover the estimated total payroll expenditures of the "other health services" component.[20]

Nonmedical expenditures were evenly distributed between regional and nonregional purchases. Medical expenditures were heavily weighted towards regional purchases. At the clinic most of these expenses represent the cost of medical care which, while free to the consumer, is actually paid for by philanthropic sources. Since several of the other health services covered in this section are also likely to be charitable organizations it seems reasonable to expect that they too incur substantial regional medical expenditures. Nonregional medical expenditures represent a prorated estimate based on the clinic's expenditures on supplies and equipment.

Summary of Results for the Input Supplies Sector

Estimates of the distribution of the medical industry's income among major inputs and by region of purchase are summarized in Tables 61 and 62.

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[20]"Report on Examination." In fiscal year 1967, the clinic employed four professionals and three nonprofessionals; total payroll expenses were $38,400.

TABLE 60.--Distribution of the Grand Traverse Region's "other health services" expenditures, by input and region, 1967

Input classification	Expenditure	
	Amount	Percentage of total
	1,000 dollars	Percent
Labor:		
Professionals	91.0	39.0
Nonprofessional	50.1	21.4
Subtotal	141.1	60.4
Other inputs:		
Regional--		
Medical	55.1	23.6
Nonmedical	14.7	6.3
Nonregional--		
Medical	8.0	3.4
Nonmedical	14.7	6.3
Subtotal	92.5	39.6
Total	233.6	100.0

TABLE 61.--Distribution of the Grand Traverse Region's medical expenditures, by service, region, and type of input, 1967

Input and regional source	General hospitals	Psychiatric hospitals	Nursing homes	Professionals	Drugs and drug sundries	Eyeglasses and appliances	Public health	"Other"	Total services
	1,000 dollars								
Regional expenditures:									
Labor--									
Self-employed	--	--	36.6	5,566.3	624.5	94.4	--	--	6,321.8
Professionals	3,425.0	1,770.0	264.0	200.0	240.0	36.0	101.9	91.0	6,127.9
Nonprofessionals	1,946.0	4,319.0	805.0	964.4	366.4	55.7	34.2	50.1	8,540.8
Total	5,371.0	6,089.0	1,105.6	6,727.7	1,230.9	186.1	136.1	141.1	20,987.5
Other inputs--									
Medical	792.0	117.0	78.6	--	--	--	12.3	55.1	1,055.0
Nonmedical	1,399.0	865.0	276.7	1,283.0	321.3	48.5	22.2	14.7	4,230.4
Total	2,191.0	982.0	355.3	1,283.0	321.3	48.5	34.5	69.8	5,268.4
Regional total	7,562.0	7,071.0	1,460.9	8,013.7	1,552.1	234.6	170.6	210.9	26,275.9
Nonregional expenditures:									
Medical	792.0	235.0	6.3	540.9	2,652.0	582.5	--	8.0	4,816.7
Nonmedical	348.0	249.0	104.9	1,283.0	321.3	48.5	16.3	14.7	2,385.7
Nonregional total	1,140.0	484.0	111.2	1,823.9	2,973.3	631.0	16.3	22.7	7,202.4
All expenditures	8,702.0	7,555.0	1,572.1	9,837.6	4,525.5	865.6	186.9	233.6	33,478.3

TABLE 62.--Percentage distribution of the Grand Traverse Region's medical expenditures, by service, region, and type of input, 1967

Input and regional source	General hospitals	Psychiatric hospitals	Nursing homes	Professionals	Drugs and drug sundries	Eyeglasses and appliances	Public health	"Other"	Total services
	Percent								
Regional expenditures:									
Labor--									
Self-employed	--	--	2.3	56.6	13.8	10.9	--	--	18.9
Professionals	39.3	23.4	16.8	2.0	5.3	4.2	54.5	39.0	18.3
Nonprofessionals	22.4	57.2	51.2	9.8	8.1	6.4	18.3	21.4	25.5
Total	61.7	80.6	70.3	68.5	27.2	21.5	72.8	60.4	62.8
Other inputs--									
Medical	9.1	1.5	5.0	--	--	--	6.6	23.6	3.2
Nonmedical	16.1	11.4	17.6	13.0	7.1	5.6	11.9	6.3	12.6
Total	25.2	13.0	22.6	13.0	7.1	5.6	18.5	29.9	15.7
Regional total	86.9	93.6	92.9	81.5	34.3	27.1	91.3	90.3	78.5
Nonregional expenditures:									
Medical	9.1	3.1	0.4	5.6	58.6	67.3	--	3.4	14.4
Nonmedical	4.0	3.4	6.7	13.0	7.1	5.6	8.7	6.3	7.1
Total	13.1	6.4	7.1	18.5	65.7	72.9	8.7	9.7	21.5
All expenditures	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In the next chapter, these results will be combined with those from the producing and consuming sectors to depict the pattern of interactions resulting from the Grand Traverse medical economy's network of interindustry and interregional trade.

These tables bring together many details which have already been considered individually. They clarify the expected concentration of expenditures on labor inputs. Yet with the labor component broken down into the three categories, there appears to be a remarkably even distribution of labor expenditures in the total for all medical services. In some respects this is the result of estimating techniques, but there are sufficient factual data behind the calculations for the major services to minimize the possibility and importance of extraordinary errors.

In terms of income, the most important input was nonprofessional labor. This, of course, was strongly influenced by the psychiatric hospital's large number of workers. The second most important input was self-employed professional labor. The significance of this component is predictable and might be expected for any region's medical economy.

These figures also have meaning in terms of the numbers of people in the different occupations. In the next chapter, which deals briefly with the economic relevance of employment in the medical industry, it will be shown that the numbers of personnel in each occupational classification are disproportional to its total income. The implicit relationship between high earnings and few self-employed professionals will then be addressed, albeit indirectly, in the following chapter.

Expenditures on other inputs clearly account for a far smaller percentage of medical incomes than labor. Results show that they are almost evenly divided between medical goods and services and nonmedical goods and services. Most of the former are purchased from nonregional sources

and, here, by far the largest item is accounted for by drug store purchases. This too will be the subject of further exploration as future chapters focus on the overall interregional movement of funds and the investigation of the drug industry's profits.

CHAPTER VIII

INCOME AND EXPENDITURE ACCOUNTS--SUMMARY AND IMPLICATIONS FOR DEVELOPMENT AND TRADE

For each component of the Grand Traverse Region's medical producing sector, Tables 63 and 64 show the derivation of its income from each component of the consuming sector and the expenditure of its income on each component of the input supplies sector. The data in these tables are derived from tables in the two preceding chapters. Modifications in previous tables include merging physicians, osteopaths, dentists, and "other professionals" into "professional services;" deleting "medical insurance;" and combining regional and nonregional expenditures previously shown separately so that there is no distinction with respect to where income was earned or spent. In Tables 63 and 64 each figure in the total income row can be obtained either by adding the columnar entries above it for the consumer sector or below it for the input supplies sector.

From an overall point of view the results show the dominance of private consumers on the purchasing side and of labor on the inputs side. Government expenditures are second in magnitude to consumer expenditures. In this region the psychiatric hospital ensures significant nonfederal expenditures. Federal expenditures are most pronounced in services for which public insurance programs are operative: hospitals, professional services, and nursing homes. This relative influence is, as might be expected, greatest in the last of these. This result would not have appeared had the analysis covered a period prior to 1967.

TABLE 63.--Intersectoral distribution of the Grand Traverse Region's medical industry income, 1967

Item	General hospitals	Psychiatric hospital	Professional services	Drugs and drug sundries	Eyeglasses and appliances	Nursing homes	Public health	Other	Total
	1,000 dollars								
Consuming sector:									
Source of income--									
Private:									
Consumers	5,339.9	844.2	8,354.7	4,344.5	848.2	393.6	--	--	20,125.1
Philanthropy	272.8	89.9	1.9	--	--	36.6	--	85.0	486.2
Other	--	--	--	--	--	--	--	32.0	32.0
Public:									
Federal	2,576.3	33.0	994.1	90.5	8.7	901.4	54.4	94.0	4,752.4
State and local	513.0	6,587.9	486.9	90.5	8.7	240.5	132.5	22.6	8,082.6
Total income	8,702.0	7,555.0	9,837.6	4,525.5	865.6	1,572.1	186.9	233.6	33,478.3
Input supplies sector:									
Expenditure of income--									
Labor:									
Self-employed professional	--	--	5,566.3	624.5	94.4	36.6	--	--	6,321.8
Professional	3,425.0	1,770.0	200.0	240.0	36.0	264.0	101.9	91.0	6,127.9
Nonprofessional	1,946.0	4,319.0	964.4	366.4	55.7	805.0	34.2	50.1	8,540.8
Other inputs:									
Medical	1,584.0	352.0	540.9	2,652.0	582.5	84.9	12.3	63.1	5,871.7
Nonmedical	1,747.0	1,114.0	2,566.0	642.6	97.0	381.6	38.5	29.4	6,616.1

TABLE 64.--Percentage distribution of the Grand Traverse Region's medical industry income, 1967

Item	General hospitals	Psychiatric hospital	Professional services	Drugs and drug sundries	Eyeglasses and appliances	Nursing homes	Public health	Other	Total
	Percent								
Consuming sector:									
Source of income--									
Private:									
Consumers	61.4	11.2	84.9	96.0	98.0	25.0	--	--	60.1
Philanthropy	3.1	1.2	0.1	--	--	2.3	--	36.4	1.4
Other	--	--	--	--	--	--	--	13.7	0.1
Public:									
Federal	29.6	0.4	10.1	2.0	1.0	57.3	29.1	40.2	14.2
State and local	5.9	87.2	4.9	2.0	1.0	15.3	70.1	9.7	24.2
Total income[a]	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Input supplies sector:									
Expenditure of income--									
Labor:									
Self-employed professional	--	--	56.6	13.8	10.9	2.3	--	--	18.9
Professional	39.4	23.4	2.0	5.3	4.2	16.8	54.5	39.0	18.3
Nonprofessional	22.4	57.1	9.8	8.1	6.4	51.2	18.3	21.4	25.5
Other inputs:									
Medical	18.2	4.7	5.5	58.6	67.3	5.4	6.6	27.0	17.5
Nonmedical	20.0	14.8	26.0	14.2	11.2	24.3	20.6	12.6	19.8

As previously noted, labor is the principal recipient of income expenditures. This is heavily influenced by the earnings of self-employed professionals. It should be noted, however, that in most components these earnings include undistinguished profits.

Developmental Aspects of the Medical Industry

In terms of the medical industry's impact on development, these large labor expenditures should constitute a positive factor. It is not a major objective of this research to pursue the relationship between the medical industry and development, but the findings herein and the contemporary emphasis on new approaches in rural development are indicative of the need and timeliness of further research. Further exploration of the employment impact would, as suggested later, be a potentially valuable approach.

Data about labor expenditures were found to be specially amenable to accurate representation, particularly with respect to the large institutional employers. Among individual health services, labor expenses ranged from 80.5 percent of all expenditures in the psychiatric hospital, to 21.1 percent in eyeglass and appliance stores.[1]

Total expenditures by the producing sector were estimated at approximately $35,000,000. Labor expenses, including returns to the self-employed, were $21,000,000--62.7 percent of total expenditures. Payroll expenditures in all industries, again including estimated returns to the self-employed, were approximately $160,300,000. The medical industry, therefore, accounted for 13.1 percent of the region's total payroll expenditures. Furthermore, the medical industry employed 3,214 people,

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[1]All the psychiatric hospital's labor expenses were for professional and nonprofessional employees, whereas half of the eyeglasses and appliances stores' labor expenses were for self-employed professionals.

8.4 percent of the region's work force of 38,485 people.[2]

These employment details establish the medical industry as a significant economic force in the Grand Traverse Region. Other industries such as agriculture, manufacturing, and services have larger payrolls and more workers, but these are broadly defined major industries; and services, for example, include most components of the medical industry. If these broad industrial groupings are subdivided into secondary, tertiary, and quaternary classes, it is found that below the level of the major industrial groupings the medical industry is, with the possible exception of fruit farming, the region's principal economic activity in numbers of employees and size of payroll.[3] The major economic effects are undoubtedly felt in Grand Traverse County, where the medical industry is heavily concentrated. Nevertheless, the industry is so large and important that it encompasses all eight counties in its predominant industrial position.

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[2]This estimate was obtained by combining information from the U.S. Department of Commerce and the Michigan Employment and Security Commission. The former estimates employment for the first quarter of 1967 at 24,962. The income of this group was estimated earlier in this study as $97.2 million. Department of Commerce estimates exclude: government employees, agricultural workers, the self-employed, and, of particular importance to this region, seasonal workers. A more realistic estimate of the total work force was obtained from Employment and Security Commission figures. Their estimate of 1967 employment is 42,525. This however, is for the eight counties plus Osceola County. The estimate can be adjusted to exclude Osceola by reducing it by 9.5 percent, the percentage of employment attributable to Osceola. The adjusted estimate of regional employment is 38,485 (42,525 x .905). The difference between this and the Commerce estimate is 13,523 workers. The wage bill for these workers, obtained by multiplying 13,523 by the average wage, $4,667, is $63,121,000. Total wages and salaries, obtained by adding this and the Commerce estimate, were $160,300,000.

[3]U.S. Bureau of the Census, County Business Patterns, 1967, Michigan CBP-67-24 (1968).

Despite the evident importance of the medical industry as an employer, the relativity of this role to development might be slight, or at least only expressable in terms of income distribution, were it not for the industry's ability to attract substantial nonregional financing. It was shown (Table 47, page 133) that nearly $17,000,000 worth of medical services were paid for by nonregional sources. This is approximately half the region's total medical income. Under the simple assumption that half the industry's salaries and wages can likewise be attributed to nonregional funds, $10,500,000 worth of jobs, about 1,600, were supported by the industry's export activities.[4]

It is a fairly straightforward matter to attribute the major share of employment-related development to the region's hospital structure. Nearly 70 percent of the combined incomes of the psychiatric and the general hospitals originated externally (Table 30, p. 92). Furthermore, the hospitals employed 2,162 people in 1967 (Table 37, page 108). While a large proportion of the psychiatric hospital's employees were nonprofessionals, most employees in the general hospitals were professionals. Thus, these institutions were not only able to offer substantial numbers of jobs but also to offer opportunities in a wide range of skills. And, though the hospitals do dominate employment, other employers are important too, particularly nursing homes, professional offices and drug stores (see Table 65). In addition, medical employment is nonseasonal, hence it incurs extra economic significance in terms of stability of employment for many people.

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[4]A more detailed analysis would require adjusting medical services' wage bill by its ratio of exports to total production.

TABLE 65.--Distribution of the Grand Traverse Region's medical personnel, by place of work and occupational characteristics, 1967

Place of work	Personnel			
	Total	Self-employed professionals	Profes-sionals	Nonpro-fessionals
	Number			
General hospitals. . . .	1,257	--	685	572
Psychiatric hospital . .	905	--	113	792
Nursing homes.	310	4	55	251
Professional offices . .	500	177	40	283
Drug stores.	160	40	40	80
Eyeglass and appliance stores	24	6	6	12
Public health service.	32	--	20	12
Other health service.	26	--	15	11
Total.	3,214	227	974	2,013

Very little research has been conducted into the impact of the medical industry on regional economic development. It is therefore difficult to conclude that the Grand Traverse Region is particularly unusual. Where comprehensive medical industries are established, one would expect the economic effects to be relatively greater in rural than in urban areas. Whether there are other rural areas where the scope and impact of the medical industry are comparable to Grand Traverse remains for future study. But it should also be possible to study the expected impact of increasing the size of the industry in various regions. Policy implications regarding economic criteria for regional medical planning have traditionally been focused on population needs. A result has been that demands for new services or additions to existing ones have consistently exceeded the supply of construction funds and human resources. Contemporary policies indicate that a large share of new public expenditures will be devoted to helping the big cities' health care needs. These needs are real, but so are rural needs. Not all of the latter can be solved by increasing accessibility to big city facilities. It is believed that the Grand Traverse example of what the medical sector can do in a rural area should provide policy makers with an additional dimension in their struggle for a reasonable share of health planning funds.

Interregional Trade in Medical Services

Labor intensity and the high proportion of total outlays spent on labor tend to enhance the developmental impact of the medical industry relative to other industries which might, for example, rely on larger proportions of nonregionally produced, i.e., imported, inputs. If, on the other hand, excessive profits are earned from the sale of some medical goods and services, then the cost to a region of maintaining its medical

industry may also be excessive and the developmental impact moderated, particularly with respect to expenditures on imported, monopolistically produced goods and services. In reality, the Grand Traverse medical industry expends about 21 percent of its income on imports (Table 62, p. 165). How much represents monopoly profits will be the subject of ensuing chapters; for now, this chapter can be concluded by drawing together its and the previous chapters' results regarding regional and nonregional expenditures to determine whereabouts the region stands with respect to what might be called a "balance of medical trade."

The essential step is to combine the results shown in Table 47, page 133 and Table 61, page 164. The latter table contains most data for the region's medical industry. These are itemized, for each service, as "nonregional expenditures." To obtain uniformity, the eight services are combined into the same groups used in the export analysis in the previous chapter.[5] Also included, in addition to those imports discussed in this chapter, are payments for nonregionally produced insurance. These are a direct consumer purchase which do not represent input purchases by the producing sector and which, therefore, can be said to lie outside the actual trade patterns established by the region's medical industry. Hence, a gross trade balance can be obtained which is concerned solely with the trade of the region's medical industry, and then a net balance which incorporates the reduction in regional income resulting from insurance expenditures. The detailed trade accounts are shown in Table 66.

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[5]The relevant groups and components are: (1) Hospitals, both general and psychiatric; (2) medical services including professional services, nursing homes, eyeglasses and appliances, and "other" health services; (3) drugs and drug sundries; and (4) public health.

TABLE 66.--Balance of medical payments of the Grand Traverse Region, 1967

Medical service	Total imports by source			Total exports by source			
	Total imports	Medical	Non-medical	Total exports	Consumers	Philanthropy	Government
	1,000 dollars						
General hospitals. . . .	1,140.0	792.0	348.0	3,947.3	1,059.4	--	2,887.9
Psychiatric hospital . .	484.0	235.0	249.0	7,269.2	758.8	89.9	6,420.5
Med. services group[a] . .	2,588.8	1,137.7	1,451.1	3,544.7	1,122.8	--	2,421.9
Drugs and drug sundries	2,973.3	2,652.0	321.3	1,904.8	1,750.8	--	154.0
Public health.	163.0	--	163.0	120.7	--	--	120.7
Total.	7,349.1	4,816.7	2,532.4	16,786.7	4,691.8	89.9	12,005.0
Gross export balance	9,437.6						
Insurance expenditure	1,972.4						
Net export balance	7,465.2						

[a]Includes professionals, nursing homes, eyeglasses and appliances, and "other" health services.

The relevant balance for the medical industry is shown as the gross export balance. The amount, $9,437,600, is the difference between non-regional payments to the industry and the industry's purchases of non-regionally produced goods and services. The net export balance, $7,465,200, is the excess of exports over imports after insurance payments are accounted for. The gross export balance is approximately 28.0 percent and the net balance 21.0 percent of the region's total medical income.

These results tend to confirm the previous suggestion that fruitful research can be constructed regarding the role of the medical industry in regional economies. Apart from looking at the gross impact of nonregional payments for medical services, it should be possible to examine the import structure more closely to see what economic opportunities exist for regional production of imported goods and services. A large proportion of these payments are, admittedly, for nonsubstitutable items such as social security. There may be other items, some medical supplies for example, which could be produced regionally or purchased from nonregional sources at lower prices than currently paid. The latter possibility is germane to the objectives of this paper concerning excessive expenditures for medical care. In subsequent chapters the drug industry and medical equipment industry will be examined to determine whether they are able to influence prices and thereby inflate the cost of medical care. Before turning to these industries, however, an analysis will be made of competition and profitability as they concern the region's physicians. Here, excessive earnings, if found, have little or no impact on imports, they would, however, increase export earnings and increase the cost of health care both to the regional and nonregional populations.

CHAPTER IX

ANALYSIS OF PHYSICIANS' PROFITS

The Physician Shortage

A major conclusion of the National Advisory Commission on Health Manpower is that "...there is currently a shortage of physicians and this shortage will worsen in relation to growing demand, despite the expected increase in the supply of physicians in the years ahead."[1] The commission's concern over a shortage of physicians restates the conclusions of many studies.

In the early 1930's Drs. Robert I. Lee and Lewis W. Jones estimated health manpower requirements for the nation. They found a total need for 134.7 physicians per 100,000 people.[2] This meant that at that time there was a shortage of approximately 13,000 physicians. They doubted that the country could economically support an increased supply of physicians and other health professionals at that time, and concluded that the provision of adequate medical care would depend more on reorganization of the delivery system than upon increases in numbers of personnel.

The shortage still exists, but because the delivery system has been reorganized, through the use of auxiliary personnel and new tech-

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[1] Report of the National Advisory Commission on Health Manpower, I, 13.

[2] The Fundamentals of Good Medical Care (Chicago: The University of Chicago Press, 1933), p. 302.

nology, the services of physicians have increased far more rapidly than the number of physicians. It is estimated that as a result of these changes, output per physician will have increased 50 percent between 1965 and 1975, whereas the growth in the number of physicians is expected only to keep pace with the growth in population. However, as output per physician increases relative to the supply of physicians there will be a growing shortage in consultation between patients and physicians.[3]

While the number of physicians per person has declined since the beginning of the century, the growth in the number of physicians has kept pace with growth of population over the past 20 years, and is expected to do so in the next 10 years. Despite this, access to physicians has diminished and physicians are confronted with new problems in rationing their time and services.

Factors largely responsible for the expected increasing difficulty of gaining easy access to personal services of physicians are: the trend towards specialization which has resulted in a reduction in the number of persons seen per generalist; the increasing amount of time physicians must devote to managerial, clerical, and other nonmedical responsibilities; and the increase in the number of hospital-based physicians and in the amount of time spent in hospitals by private practitioners.[4]

Expected increases in the supply of physicians will be less than sufficient to match the forces which decrease access. There is, therefore, a need to increase the number of physicians above presently planned

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[3] Report of the National Advisory Commission on Health Manpower, I, 13.

[4] Ibid., 14-15.

levels. Though the full extent of the increase required is uncertain it is clear that there is a definite need for substantial increases in the number of physicians required to provide adequate care for disadvantaged groups and to staff hospitals at a satisfactory level. Unfortunately, one of the major problems facing policymakers concerned with meeting these needs is the difficulty of transforming needs into effective demands.

Part of the problem stems from the high income elasticity of demand for physicians' services, which means that people are buying more services as their incomes rise. Another part stems from increasing public intervention which has enabled the poor and the elderly to obtain more services than previously. Yet the number of physicians in private practice actually decreased from 109 per 100,000 people in 1950 to 97 per 100,000 in 1965.[5] The problems resulting from these tendencies have been aggravated by increasing specialization and the extra-medical responsibilities.

All these problems are compounded by the economic behavior of physicians. "A significant and articulate portion" of the medical profession opposes changes in the health care delivery system.[6] Physicians appear to maintain the irrational belief "...that there can be rapid and far reaching technological change without disturbing the traditional organization of medical practice."[7] They are able to hold to this position because, and above all else, they are discriminating monopolists who can directly influence the demand for their services. Nevertheless,

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[5]U.S. Department of Health, Education, and Welfare, Health Resource Statistics.

[6]U.S Department of Health, Education, and Welfare, Report of the National Conference on Medical Costs, p. 25.

[7]Ibid., p. 25.

although physicians' incomes have grown rapidly in the past, there is reason to believe that, rather than exploiting their market power to maximize income in the short-run, physicians have controlled fees and services so as to maintain their relative income position. Despite the rapid increase in demand for their services since 1950, the incomes of physicians have not increased much more rapidly than incomes of other professional groups (Table 67). Given the rapid growth in demand, physicians' fees could have risen more rapidly than they have.[8] However, in addition to fees, implicit pricing, through queues and other rationing devices, has been used to control demand and thus maintain incomes.

If expected trends materialize, physicians' fees will have increased by three percent per year and productivity by four percent per year for the decade 1965-75. Assuming costs remain a constant share of gross income, as they have in the past, average income will increase by about seven percent per year. This means that physicians incomes will just about double over the decade. This growth in income exceeds the growth in the previous decade, but is in line with the more rapid rate of growth projected for the economy over the decade ending in 1975. The rate would, therefore, tend to maintain physician incomes relative to the incomes of other professional groups if the latters' incomes also grow at the projected rate.[9]

Physicians' Market Power

The large and rising income of physicians is a clear reflection

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[8] American Medical Association, Report of the Commission on the Cost of Medical Care, I, 66.

[9] Report of the National Advisory Commission on Health Manpower, II, 242-243.

TABLE 67.--Indexes of income of physicians and selected occupational classes, 1951-65

Item	1951	1955	1959	1963	1965
Physicians.	100	122	168	191	220
Professional, technical, and kindred workers . . .	100	124	154	--	205
Managers, officials, and proprietors	100	128	161	--	197
Average annual earnings per full-time employee, all industries.	100	119	141	163	176

Source: Report of the National Advisory Commission on Health Manpower, II (Washington: U.S. Government Printing Office, 1967), 242.

of the market conditions surrounding the profession and is the most relevant index of the shortage of physicians.[10] Were resources free to move, physicians would not have been able to maintain their high relative income position. In a competitive market situation with prices above equilibrium, supply should exceed demand and a surplus should result. Since a surplus of physicians is clearly not observable, it may be concluded that supply is being artificially limited.[11]

It is these associations that have led to charges of noncompetitive behavior being levied against the medical profession, and to research into the amount of excess income physicians have been able to collect as a result of this behavior.

Modern analyses of professional incomes originate with a 1945 study conducted by Milton Friedman and Simon Kuznets.[12] They found that the average annual income of physicians exceeded that of dentists by 32 percent.[13] This differential can be translated into an exposition of the actual excess earnings of physicians attributable to the market power.[14]

An income differential between professions does not, itself, establish a lack of adjustment between demand and supply. Neither would identical incomes be evidence of a close adjustment. One occupation's income may be higher than another's in order to compensate for differences in

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[10]Harris, The Economics of American Medicine, p. 147.

[11]H.E. Klarman, The Economics of Health (New York: Columbia University Press, 1965), p. 88.

[12]Friedman and Kuznets, Income From Independent Practice.

[13]Ibid., p. 105.

[14]This section closely follows Klarman's interpretation of the Friedman and Kuznets study.

costs, nonmonetary advantages, and the like. Yet differences in returns between broad classes of occupations appear to be larger than can be explained by these differences.[15]

If the higher training costs of physicians relative to those of dentists are allowed for, the estimated equilibrium differential is reduced by 17 percent. Since greater variability of incomes among physicians than among dentists probably made the former's occupation relatively more attractive, and nonpecuniary advantages such as prestige, opportunity to render services and make contacts, and working conditions also favored physicians, Friedman and Kuznets concluded that the persistent income differential between the two related professions could only be explained if there were restrictions on entry into medicine, and that the two were, in effect, noncompeting groups.[16] The authors discussed and rejected the possibility of a lack of persons with sufficient ability, and concluded that the restrictions resulted either from limitations on the capacity of educational facilities or from impediments to the granting of licenses by the states, or both.

Friedman and Kuznets calculated that there should be approximately three times as many physicians as dentists in order to eliminate the excessive income differential between the professions. At the time of their study the ratio was 2:1. (Additional evidence of the ability of physicians to maintain their relative position is observable in that the ratio

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[15]Milton Friedman, Price Theory, A Provisional Text (Chicago: Aldine Publishing Co., 1962), p. 222.

[16]The greater attraction of occupations with relatively variable incomes stems from willingness of people to accept the chance, remote as it may be, that these occupations will offer a higher reward than other occupations. Friedman, Price Theory, p. 218.

has hardly changed in the past 30 years. In 1965, the ratio was 2.1:1).[17]

In a more recent analysis Friedman likens the medical profession to a craft union. Medical professionals are highly skilled, closely organized, and strategically placed to restrict the supply through control over both state licensure and entry to medical schools. Friedman points out that the medical profession differs from a craft union in that returns to labor (medical fees) account for a larger fraction of the cost of the product. But this difference can be overstated because of the high costs of hospitals and treatment. The difference is further counter-balanced by the inelasticity of demand for medical care.[18]

Despite their control over entry into the profession, physicians have only succeeded in raising their average income above the equilibrium level by approximately 15 to 20 percent. The reason for this relatively small increase has been the growth in substitutes for physicians' services, which, according to Friedman, provides "an impressive example of the possibilities of substitution in the long run."[19]

Considerations in the Application of the Friedman-Kuznets Analysis

In order to apply the Friedman-Kuznets' analysis of excess earnings to the Grand Traverse Region, the basic assumption is made that differences exist between the earnings of physicians and dentists which can only be

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[17] American Dental Association, The Distribution of Dentists in the United States, 1966, p. 22, and American Medical Association, The Distribution of Physicians in the United States, 1966, p. 10.

[18] Friedman, Price Theory, pp. 158-159.

[19] Ibid., p. 159.

attributed to the monopoly power of the former.[20] First, however, there are three points to be made which, while not affecting the methodology, are relevant to analyses of professional incomes in general and to regional application of the analysis in particular.

It has been pointed out that physicians under-report income on their tax returns to the same extent as do other independent professionals.[21] An audit of tax returns raised physicians' gross incomes by two percent and net incomes by eight percent. Hansen has pointed out that the earnings of physicians and dentists may be understated because they can easily write off certain consumption expenditures as business expenditures.[22] Were government estimates being used for the Grand Traverse Region, it might be necessary to allow for the possibility of a discrepancy of this nature. However, the physicians' income estimates used in this paper were derived from a professional source which tends to emphasize the attractiveness of medical incomes. These estimates are higher than government estimates. Accordingly, they will not be adjusted to account for possible understatement.

The second point relates to the effect of progressive income taxes. Friedman has indicated that his and Kuznets' original analysis omitted this factor.[23] The fact that physicians have higher incomes before

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[20]Monopolistic practices may also occur in the provision of dental services. The present analysis, however, is concerned with relative differences between the incomes of physicians and dentists and it will be assumed that dental incomes are an indication of the best alternative income that would be available to physicians were there no restrictions on supply and after all allowances are made for differences in training cost

[21]Klarman, The Economics of Health, p. 90.

[22]W. Lee Hansen, "Shortages and Investment in Health Manpower," in The Economics of Health and Medical Care, p. 85.

[23]Friedman, Price Theory, p. 220.

and after taxes than do dentists does not mean that the occupations are equally attractive before and after taxes. The reasons for this are that the tax base is not the same as the figure used in considering net pecuniary returns, and that the base does not allow for nonpecuniary factors. These adjustments can be accounted for by using net rather than gross incomes in comparing the occupations.[24]

The third point was raised by Friedman and Kuznets themselves.[25] They indicate that their analysis probably understates the time factor involved in training medical specialists. This is relevant to this study because a large proportion of the region's physicians are specialists. It has been pointed out, however, that increasing specialization is a major contributing factor to the shortage of physicians. Furthermore, by the nature of their practice, specialists are in a relatively better position than are other medical professionals to control the prices of their services. Thus, while in some respects it may be prudent to allow for the additional training costs of specialists, in other respects it may be assumed that specialists are in an unusually good position to recapture these costs.[26]

It is intended to accommodate these possibilities by using two analytical approaches. In the first, no allowances will be made for specialists' training; and the average income of all physicians will be compared with that of dentists. In the second, it will be assumed that the additional training costs of specialists are just recaptured by the difference

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[24] Ibid., p. 220.

[25] Friedman and Kuznets, Income From Independent Professional Practice.

[26] Another criticism that has been leveled at this type of analysis is that physicians work much longer hours than do dentists and that therefore they should earn more. The criticism, however, tends to validate the supply restriction argument.

between their incomes and those of general practitioners; and the average income for general practitioners will be used as the base for comparison with the average income for dentists. This approach will yield two estimates which might be regarded as upper and lower bounds on the true value of excess incomes.

Measurement of Excess Incomes

The first step in the analysis is to compute the percentage difference between physicians' and dentists' net incomes. Two methods will be followed: A, using the average net income of all physicians; and B, using the average net income of general practitioners. An allowance will then be made for the higher training costs of physicians, which, following Friedman and Kuznets, will be 17 percent. Whatever difference remains after this allowance will be taken as the excess attributable to noncompetitive factors. Estimates of the region's economic loss due to physicians' monopoly power can then be obtained by multiplying the percentage differential by the average incomes of the two groups of physicians. The methods and resulting estimates are presented on the next page.

Derivation of 1967 excess incomes of the Grand Traverse Region's physicians.[27]

Method A

1. Total net income of all physicians	$3,225,810.00
2. Average net income of all physicians	$ 35,363.00[28]
3. Average net income of dentists	$ 25,753.00
4. Percentage difference between 2 and 3	36.15%
5. Percentage of excess income of physicians; obtained by reducing the preceding figure by 17 to allow for differences in training costs	19.15%
6. Regional excess income: obtained by applying the preceding figure to the total net income of the region's physicians	$ 617,743.00

Method B

1. Total net income of all physicians (using general practitioner's income as the appropriate figure)	$2,882,360.00
2. Average net income of general practitioners	$ 31,330.00
3. Average net income of dentists	$ 25,753.00
4. Percentage difference between 2 and 3	21.65%
5. Percentage of excess income of physicians (same approach as in Method A)	4.65%
6. Regional excess income (same approach as in Method A)	$ 134,030.00

The results show that excess earnings of physicians over those of dentists in 1967 lay approximately between $134,000 and $618,000. These are estimates of the financial benefits to the region's physicians resulting from artificial controls on the supply of physicians.

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[27]The analysis is based on estimated incomes presented earlier on page 97.

[28]This average income is approximately $6,400 less than that reported by Sarkar for the Copper Country Region (Sarkar, pp. 60-62). The difference may result from the use of different sources or the relative shortage of physicians in the Copper Country. It may also reflect the fact that in computing his average income, Sarkar included approximately $5,000 for under-reported incomes. For two reasons this factor was not included in the overall average used here: first, because the evidence was based on 1950 data, whereas the incomes used in this analysis were based on current surveys conducted to show doctors where their best income opportunities lie; and secondly, because not all physicians' incomes are necessarily earned from medical practice. Removal of the $5,000 brings Sarkar's and my estimates much closer together.

Conclusion

These estimates are 0.40 and 1.85 percent of the region's total medical income. In an article for the National Conference on Medical Costs, Victor Fuchs indicated that physicians' monopoly income is not too relevant to the physician shortage problem because, even if it does exist, it amounts to a very small part of total medical spending.[29] This argument sidesteps the point that monopoly incomes result from artifically created shortages of physicians. Regardless of the share of medical spending taken in monopoly incomes, and whether 0.40 percent or 1.85 percent amounts to a small or large part of the Grand Traverse Region's medical spending, the conclusion here is that such excess incomes do exist. As such, they represent an amount that could, theoretically, be taxed or otherwise redirected towards alternative uses, without disturbing the output level of physicians' services. Or, their existence could be used as a base from which to argue for increasing output to a more socially acceptable level such as might be defined in the area of equality between price and average cost. Finally, their existence, and Fuchs implicitly admits that they do exist, in no way detracts from, but rather heightens, the necessity for increasing the numbers of physicians.

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[29] Fuchs, p. 25.

CHAPTER X

ANALYSIS OF THE DRUG INDUSTRY'S PROFITS

Characteristics of the Industry

In The Economics of American Medicine, Seymour Harris has this to say about the drug industry:

> Many are concerned that an industry which comes close to being a public utility achieves the highest profits in relation to sales and investment of any industry; is highly concentrated in its control of the market; reveals serious monopolistic trends; increases the costs to consumers by differentiating products at a dizzy pace, with the differentiated product usually similar to or identical with existing products; and greatly inflates costs through record expenditures on selling. The competition among the companies to overwhelm the doctors by repetitious and often misleading advertising, and a failure to give as much publicity to bad side effects as the immediate beneficial effects, are unfortunate. Thus competition forces even the highly moral firms to become less ethical in their behavior. In the drug industry the relation of labor to total costs is minimal; and like the soap and tobacco industries, using similar selling techniques, their relation of labor to value added is a minimum--selling expenses and profits are the large items in gross receipts.
>
> The cost of drugs is too high. I say this, though I am aware that the research contributions of the industry are important and that the lives saved, suffering averted, and acceleration of recoveries are worth more than the $4 billion spent on drugs. But the cost could be substantially less.[1]

This statement vividly summarizes the conclusions of many researchers regarding the industry's market performance. Most of these conclusions have been reached in recent years. Prior to the Kefauver hearings on administered prices in the drug industry in 1959-61, no articles concerning the industry had been published in professional economic journals.[2]

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[1] Harris, p. 6.

[2] Hugh D. Walker, "Market Power and Price Levels in the Ethical Drug Industry" (unpublished Ph.D. dissertation, Vanderbilt University, June, 1967), pp. 2-3.

As sources of current information the earlier hearings have now been superseded by congressional reports on Senator Nelson's hearings on competitive problems in the drug industry. These were conducted in 1967-68. The Nelson inquiry was the culmination of all the previous hearings and research. It has added to and validated many of the charges made in earlier inquiries, and, because of its professional and scholarly approach, has been less criticized and disputed than the Kefauver inquiry.

The objectives of this chapter are to review some of the salient points brought out in the Nelson hearings as they relate to the monopolistic structure of the drug industry and to the industry's ability to convert its market power into excessive profits.

In a highly critical testimony given before the Senate Subcommittee on Monopoly, George S. Squibb, a former vice president of the Squibb drug company, indicted the industry on the grounds that (among other things) its pricing and marketing policies were discriminatory and led to excessive profits which in his view were inconsistent with social responsibility.

> A product that does the job that modern drugs often do, affords under any comparative value approach, a most unusual temptation for the pricer to set his figure much higher than might otherwise be the case. Classic theories of price established to get a share of a competitive market are applicable only to a very slight degree. In fact, it often might be said that each drug product can be established in its own market by skillful promotion and exploitation of its own particular virtues. Not only has the pharmaceutical industry been successful in maintaining the conviction with many physicians and buyers that not all drugs are alike, but it has even succeeded in persuading them that all products are different, which is a much more effective argument from a sales point of view. Leaving aside at this point the validity of this claim, the mere fact that it has been frequently and effectively established, and continues to be, even under the conditions of current controversy and attack, gives the pricer a unique opportunity to set his figure without relation to any factor except what he believes the market can bear. He, of course, will take into consideration, in a general way, the existence and success of comparable products, or products used for the same therapeutic or diagnostic purposes, but not by definition any product exactly like the one to be

priced because there is none. It is well to remember here that differences for pricing purposes arise not only from varying chemical or molecular structures, but from differing manufacturing sources or brand names and sales programs as well.

Prices set in this way on prescription products lead to the very situation that is so often criticized today; an enormous range between trade or retail prices and those given to institutional or government purchasers. The rigidities of prices at the trade level already described tend to freeze the prices at the top level for at least a considerable period of time during which the disruption of the institutional pricing structure occurs, and the perplexing and dismaying situation now deplored by retail pharmacists, legislators, and the general public arises.[3]

On social responsibility, Mr. Squibb quoted from a book published in 1932.

The manufacture and distribution of medicines, because of their intimate relation to the health and welfare of a community or nation, partake of the nature of public utilities. In view of the shifting control from professional to financial hands, manifested by recent developments in the drug industry, the public interest may require "regulation" of the industry, through the guarantee of a fair return to investors and the limitation of prices to be charged to consumers.[4]

He indicated that these remarks were even more applicable today. He was, however, opposed to treating the industry as a public utility.[5] Rather, it should be left to the industry to "...restore its reputation among the general public and among the legislative bodies, Congress, State and Federal, that it is operating within reasonably normal economic limits."[6]

Squibb equated normal economic limits with his concern about social responsibility. He noted that the drug industry was the most profitable

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[3]U.S., Congress, Senate, Subcommittee on Monopoly of the Select Committee on Small Business, Competitive Problems in the Drug Industry, 90th Cong., December 14, 19, 1967, and January 18, 19, and 25, 1968, Pt. 5, p. 1580.

[4]C. Rufus Rorem and Robert P. Fischelis, The Cost of Medicine (Chicago: The University of Chicago Press, 1932), pp. 233-234.

[5]U.S., Congress, Competitive Problems in the Drug Industry, Pt. 5, p. 1604.

[6]Ibid.

industry in the country. In 1966 the rate of return after taxes was 21.1 percent. "A fair return" would be "the average return of comparable consumer goods industries that have a broad base of utilization" -- about 12 percent.[7] This profit rate level would not drive out smaller companies but it would result in lower prices to consumers. The drug industry could achieve this level by planning and budgeting, and by reconstructing itself in a "believable or credible fashion for public acceptance rather than leaving the situation as it is now which is out of control."[8] Were the industry to take it upon itself to adopt such comparative measures, it might succeed in avoiding restrictive legislation while simultaneously restoring public confidence.

This discussion of restrictive practices and excessive profits has been corroborated and expanded by others. Henry Steele presented evidence that the patent privilege seriously limits effective price competition.[9] The patent privilege, by enabling holders to restrict output and maintain prices at a substantial mark-up over production costs, results in large profits, a substantial share of which are used to finance sales promotion. This in turn extends monopoly power into other parts of the drug markets, thereby creating "grave imperfections" in the market information system.

Defendants of the industry produced evidence to support their contention that high profits in the drug industry were related to the risks

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[7] Ibid., 1605. Also, the rate of return (on stockholders' investment) for all drug manufacturers was 20.3 percent; the rate cited here, 21.1 percent, is applicable to "leading" drug manufacturers. Ibid., 1826-1827.

[8] Ibid.

[9] Ibid., p. 1995. Also: "Monopoly and Competition in the Ethical Drugs Market," The Journal of Law and Economics, V (October, 1962) and "Patent Restrictions and Price Competition in the Ethical Drugs Industry," The Journal of Industrial Economics, XII (July, 1964). Both reprinted in U.S., Congress, Competitive Problems in the Drug Industry, Pt. 5, pp. 1950-1997.

involved, not to the exercise of noncompetitive power.[10]

These defendants' findings were disproved, and their methodology castigated by Willard Mueller, the director of the Bureau of Economics at the Federal Trade Commission.

> Upon completing our analysis of the Conrad-Plotkin, Markham-Cootner explanation of risk and profits in the drug industry, I recalled the admonition once given by the great classical economist and logician, John Stuart Mill. Mill cautioned economists against the pitfall of multiplicity of causes. We must always be skeptical of simple statistical associations among complicated economic phenomena. Professor Kenneth Boulding put it well when he said, 'Some of us, perhaps, still have to learn that arithmetic is a complement to, not a substitute for, thought and that what my spy in IBM calls the "gigo principle," (that is, garbage in, garbage out) is a sound approach even to the most elegantly computerized simulation.'
>
> This more or less capsules my findings in reviewing the analysis of drug profits and their possible association with risk. I find, to be very brief, that the high profit experience of the drug industry is related only minimally to risk and uncertainty in a causal way. On the other hand, the high profits of the drug industry are more closely associated with high barriers to entry of new competition. In other words, in the classic tradition, the market power enjoyed by drug firms has been achieved primarily because the leading drug companies have been able to fence themselves off from effective competition, and in this sheltered position they have garnered extremely high profits--profits which the economist would label as 'abnormal' or 'excessive,' profits substantially above the competitive norm.[11]

Mueller showed that the Conrad-Plotkin measure of risk was actually a good indicator of relative market power. This finding coincides with the research results of many economists which have shown that high profits in the drug industry result from the lack of price competition; and competition is lacking because of the patent privilege which leads to concentration of production. Even when there are many sellers and potential

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[10] Ibid., Statement of Simon N. Whitney, pp. 1760-1766; and Gordon R. Conrad and Irving H. Plotkin, "Risk and Return in American Industry--An Econometric Analysis," pp. 1766-1805; and statements of Jesse W. Markham and Gordon R. Conrad, pp. 1667-1689.

[11] Ibid., Statement of Willard Mueller, p. 1840; in part quoting Kenneth Boulding, "The Economics of Knowledge and the Knowledge of Economics," American Economic Review (May, 1966), p. 10.

sellers, price competition is suppressed by sales techniques which differentiate products in the minds of doctors and consumers. Generic drug manufacturers have difficulty selling their product at any price even when it is chemically identical to an advertised product. Market structure elements which are responsible for high noncompetitive profits are seller concentration, barriers to entry, and product differentiation. One or more of these is present when price competition is ineffective; but "the most pervasive factor blocking effective price competition in drugs is the presence of substantial product differentiation of branded drug items."[12]

Measurement of Excess Profits

In reporting Mr. Squibb's testimony above, reference was made to the difference between the profit rates of the drug industry and other industries as an indicator of excess returns. There is considerable precedent for using such a comparison.[13] It will, therefore, be used here.

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[12] Ibid., p. 1828.

[13] See for example, Bain, Quarterly Journal of Economics, LXV, 293-324; Joe S. Bain, Barriers to New Competition (Cambridge, Massachusetts: Harvard University Press, 1962); L. W. Weiss, "Average Concentration of Ratios and Industrial Performance," The Journal of Industrial Economics (July, 1963); Norman R. Collins and Lee Preston, "Concentration and Price Margins in Food Manufacturing Industries," The Journal of Industrial Economics (July, 1966); National Commission on Food Marketing, The Structure of Food Manufacturing, Technical Study No. 8 (Washington: Federal Trade Commission, June, 1966), pp. 202-210; H. Michael Mann, "Seller Concentration, Barriers to Entry, and Rates of Return in Thirty Industries, 1950-1960," Review of Economics and Statistics (August, 1966), pp. 296-307; Norman R. Collins and Lee Preston, Concentration and Price Cost Margins in Manufacturing Industries (Berkely, California: University of California Press, 1968), p. 163; and William S. Comanor and Thomas A. Wilson, "Advertising Market Structure and Market Performance," Review of Economics and Statistics (November, 1967).

Table 68 shows the average rates of return on stockholder investments for the drug industry and all manufacturers. From 1950 to 1955, drug company profits were approximately equal to those of other manufacturers. Since 1956, however, drug company profits have been consistently above the average of other companies, and with the exception of one year, have occupied the highest position in the economy.

Normal returns may be presumed to be a rate of return on capital -- measured as a percentage of equity per year -- which an entrepreneur could reasonably have expected to earn had he invested in an alternative enterprise. If the average rate of return in other industries is used as a proxy for normal returns, returns to the drug industry which exceed this rate may be regarded as abnormal returns or excess profits.

Accounting profits rates, or returns on equity, may not accurately represent the theoretical long-run tendency of profit rates, though they may provide a rough guide for use in long-run average profits comparisons. To determine theoretical or true profits, revenues and costs "are strictly instantaneous magnitudes having generally an identical price level reference and time reference."[14] Analyses based on such a model can be extended over time if what holds for long-run static equilibrium can be justified as also holding for average performance over time. Cost and revenues which determine accounting profits, on the other hand, will not usually have the same price level and general time reference and could, therefore, inaccurately represent the corresponding figures implied in the theoretical approach.

While this and other "aberrations" in the measurement of theoretical profits by accounting profits are still likely to cause problems in

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[14]Bain, Quarterly Journal of Economics, LXV, 306.

TABLE 68.--Rates of return of drug manufacturers and all manufacturing industries, 1956-67[a]

Year	Profits after taxes as a percent of stockholders' equity		Profit rank of the drug industry among all manufacturing industries
	All drug manufacturers	All manufacturers	
1956. . .	17.6	12.3	2
1957. . .	18.6	11.0	1
1958. . .	17.7	8.6	1
1959. . .	17.8	10.4	1
1960. . .	16.8	9.2	1
1961. . .	16.7	9.8	1
1962. . .	16.8	9.8	1
1963. . .	16.8	10.3	1
1964. . .	18.2	11.6	1
1965. . .	20.3	13.0	1
1966. . .	20.3	13.5	2
1967. . .	18.7	11.7	1
Average	18.0	10.8	

[a]Rates of return in this table are identical with those used by Sarkar (Sarkar, op. cit., p. 70).

Source: Federal Trade Commission and Securities and Exchange Commission, Quarterly Financial Report.

analyses of individual firms, the spread of standardized accounting procedures has probably diminished their impact relative to what they were in the past. Furthermore, Bain indicates, in analyzing relatively large groups of firms and industries, one may expect that in general, price-change effects on accounting profit rates will be similar. Hence for such groups, potential aberrations built into the estimation of theoretical profits by accounting will tend to average out, and theoretical profits can be reasonably approximated by accounting profits.[15]

Another source of potential aberration, though again probably more relevant to individual firms than to groups, has been brought out by Stigler. He has argued that firms possessing market power may be able to increase certain expenses and emoluments within the firm rather than, or as well as, in reported profits. In alluding to the existence of monopoly gains in payment to noncapital inputs, he claims that monopoly elements in wages, executive compensations, royalties, and rents may be substantial.[16]

Also, Williamson has pointed out that some expenditures yield positive utilities to managers, and are incurred for the manner in which they enhance these utilities, rather than for their contribution to productivity, if any. A significant part of true monopoly profits may therefore be absorbed internally.[17]

One might argue that, because of its relatively large outlays on selling and research, the drug industry is in a relatively good position

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[15] Ibid., p. 309.

[16] George J. Stigler, "The Statistics of Monopoly and Merger," The Journal of Political Economy, LXIV (February, 1956), 35.

[17] Oliver E. Williamson, "Managerial Discretion and Business Behavior," American Economic Review, LIII (December, 1963), 1032-1057.

to capitalize on such techniques. But there are likely to be other industries with the same "advantages." These "advantages," if they do exist, are in reality more likely to accrue to individual firms within industries than to industries as a whole, unless perhaps the industry is actually composed of very few firms as, for example, the automobile industry.

Attempts have been made to measure the difference between accounting profits and true profits attributable to intangibles. It might be instructive, however, to consider such an estimate in terms of the difference it actually makes in the results. In general, however, to attempt to explain and account for all the problems involved in the accurate measurement of profits and to draw valid inferences from the observed empirical relationships, is to run the risk of obscuring meaningful results.[18] It has, therefore, been decided to proceed with an analysis based on broad cross-sectional evidence, using the Department of Commerce's accounting profit data as reasonable measures of the theoretical profit tendencies relevant to the hypothesis of excessive earnings in the drug industry. The structures outlined above are important, but on balance they seem less important than the usefulness of a straightforward approach. As Bain has observed:

> There is thus a strong case, in the present state of investigation and knowledge, for eschewing the easy road of presenting a few isolated case studies and encouraging facile and unsupported generalizations from them. Instead, we may find it is scientifically more satisfying to emphasize the cross-sectional analysis of certain basic dimensions of performance in numerous industries, striking directly at

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[18] Fritz Machlup, The Political Economy of Monopoly (Baltimore, Maryland: The Johns Hopkins Press, 1952), p. 496.

> the good of valid generalization, even though the dimensions of performance considered must be very few in number and though a great deal of the unique and sometimes important detail concerning individual industries is neglected in the process.[19]

Method of Analysis

Excess profits of the drug industry are defined as the difference between the profits of drug manufacturers and all manufacturers. In 1967 the excess profit rate was 7.0 percent of the drug companies' equity (Table 68).

The average differential for the period 1956 through 1967 was 7.175 percent.[20] It is unlikely, therefore, that in this case the selection of a single year would violate Bain's recommendation to use the average over time when using accounting profits to estimate theoretical profits. The lower, short-run profit rate is a pure accounting figure which, were it significantly different from the long-run rate, would provide an alternative estimate. The higher, long-run rate, however, should accommodate aberrations in profit calculations and provide a relatively accurate estimate of the true theoretical profit rate. Since the difference between the two measures is small, it alone will be used in the calculation to follow.

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[19] Bain, Industrial Organization (New York: John Wiley and Sons, Inc., 1959) p. 342.

[20] Sarkar, using the period 1963-67, found an excess profit rate on equity of 6.84 percent, p. 72.

Calculation of Excess Profit Rates

Stockholders equity in the drug industry in 1967 was approximately $4,498,000,000.[21] Total excess profits can be obtained according to the formula:

Excess profits = Stockholders equity x percent excess profit.

The estimate is:

$$\$4,498,000,000 \times .07175 = \$322,730,000$$

Total sales revenue in 1967 was $8,318,000,000.[22] Estimated excess profits as a percentage of sales revenue can be obtained by the formula:

$$\text{Percentage of excess profits on sales} = \frac{\text{excess profits}}{\text{sales revenue}} \times 100$$

The estimate is:

$$\$ \frac{322.73}{8,318.00} \times 100 = 3.88 \text{ percent.}[23]$$

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[21] Federal Trade Commission, Quarterly Financial Report, Fourth Quarter, 1967, p. 47. The Trade Commission notes that ideally, stockholders equity should be represented by the average of stockholders equity at the end of the year and at the end of the preceding year. The figure used above is the average for the four quarters of 1967. This approach is consistent with the methods used to derive Table 68. The difference would be insignificant were the alternative approach used.

[22] Ibid.

[23] Approximately similar estimates to these have been found by other researchers. For example: Statement of Simon N. Whitney in U.S. Congress, Competitive Problems in the Drug Industry, Pt. 5, pp. 1760-1764. Sarkar (pp. 72-75) found a low estimate of 4.17 percent and a high estimate of 10.63 percent. The low estimate was computed with basically the same method as in this paper but with the use of different periods in the computation of equity and a different value of manufacturers' sales. The high estimate was obtained by calculating the difference between a 7.0 percent normal, competitive return on industrial capital and a profit rate that was adjusted upwards to account for advertising, royalties, and intangibles. After consideration of theoretical and empirical questions involving the relationship between advertising, sales, and profits, this approach was not adopted here.

Analysis

The estimated value of drugs and related products sold in the Grand Traverse Region in 1967 was $4,525,520 (Table 35, page 103). This is an estimate of sales by retail drug stores; it does not include drugs purchased directly from wholesale drug merchants by hospitals and other institutions. The amount and distribution of these institutional expenditures must be estimated and added to retail sales to approximate total regional sales revenue.

Institutional Drug Purchases

Hospitals usually have a pharmacy department, the main function of which is to dispense drugs and other pharmaceutical products to inpatients. About 4 percent of a hospital's operating costs are incurred by pharmacies and from 2 to 3 percent by pharmaceutical purchases. Nursing homes, on the other hand, rarely have pharmacies. Most pharmaceuticals are prescribed on an independent physician-to-patient basis and are purchased for individual patients from retail druggists.

Once again, using the accounts of Munson Hospital as a benchmark, it is assumed that the region's general hospitals spent 2.5 percent of total 1967 expenditures on pharmaceuticals.[24] Total expenditures by the general hospitals were $8,702,000 (Table 63, p. 169). The estimated pharmaceutical expenditures by the general hospitals, therefore, were $217,550 ($8,702,000 x .025). The psychiatric hospital spent $198,400 for pharmaceuticals in the same period.[25] It is assumed that nursing homes made no pharmaceutical purchases. The Grand Traverse Medical Care

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[24] "Report on Examination."

[25] State of Michigan, Detail Financial Statement, 1966-67, p. 63, and 1967-68, p. 60.

Facility does operate a pharmacy; however, its purchases are made through the general hospital and are accounted for in its expenditures.[26]

The psychiatric and general hospitals purchased approximately 75.0 percent of their pharmaceuticals from manufacturers' representatives located outside the region and 25.0 percent from local drug stores.[27] Thus, total regional pharmaceutical purchases can be obtained simply by adding 75.0 percent of hospitals' purchases to the retail stores' sales. The remaining 25.0 percent of hospital purchases are assumed to be included in the retail sales.

Manufacturers' Sales Revenue

Manufacturers receive 46 percent of retail drug sales revenue.[28] The return to manufacturers from retail sales in the region in 1967 is, therefore, estimated to have been $2,081,700 (0.46 x $4,525,500). Hospital purchases from nonretail sources are usually made from wholesalers. Total hospital pharmaceutical expenditures in the region in 1967 were $415,950.[29] Seventy-five percent, $309,300, were purchases from wholesalers.[30] Wholesalers receive a mark-up of 10 percent; the remainder is assumed to be manufacturers' revenue, and for the region in 1967, this amount is estimated

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[26]Other nursing homes are likely to have small pharmaceutical expenses but these are more likely to be associated with operational charges than with drug purchases at anything more than a minimal level.

[27]The percentages were deduced from information learned in conversations with hospital administrators in the region.

[28]U.S., Congress, Competitive Problems in the Drug Industry, Pt. 5, p. 1744.

[29]Calculated as the sum of general and psychiatric hospital pharmaceutical expenditures: $217,550 and $198,400, respectively.

[30]The remaining 25 percent is accounted for under drugstore sales.

to be $278,400 (.90 x $309,300).

All that is necessary now is to add the returns from hospitals and retail stores. These were $278,400 and $2,081,700; their sum, $2,360,100, is the estimate of manufacturers' 1967 sales revenue from the region.

Calculation of Excess Profits

Estimates of manufacturers' excess profits from drug sales in the region can now be obtained with the formula:

Regional excess profits =

$$\frac{\text{Percentage of excess profits on all sales x regional sales revenue}}{100}$$

The estimate is:

$$\frac{3.88 \times \$2,360,100}{100} = \$91,572.$$

Significance of Estimated Excess Profits

Essentially this is an estimate of excess regional expenditures on drugs. It results directly from the ability of manufacturers to maintain high profit rates relative to those of other industries. It is, in effect, one measure of the cost of excessive import expenditures, to the region, and foregone purchasing power, to the consumer. But in reality, these conclusions are valid only if it is assumed that the price of a dollar's worth of drugs would be 3.8 cents less if manufacturers actually earned average profits and the same quantity of drugs were sold. Alternatively, and again assuming no change in the output of drugs, it is theoretically feasible to believe that excess profits could be taxed, as a lump sum, and returned to the region, possibly in some form of health assistance grants.

CHAPTER XI

PROFITS IN THE HOSPITAL SUPPLY INDUSTRY

Characteristics of the Industry

The hospital supply industry can be loosely defined as comprised of firms whose primary business is the production of nonpharmaceutical medical equipment and supplies. In reality, the industry is highly fragmented. Hospitals, the largest consumers of the industry's products, require a vast quantity and variety of goods. These needs are met by many different types of firms. Thus, a broader definition would include drug, electronic, computer, areospace, automotive, building materials, paper, rubber, synthetics, and many other types of companies that produce medically-oriented goods as sidelines.

Many firms have only recently become involved in the health field. Others have expanded and diversified their operations within the field. As a result, and as a reason, the industry has become characterized by rapid growth. Behind the growth, entry of new firms, and expansion of existing ones, lies the increasing demand for medical care, technological breakthroughs, and a concomitant, rapid development of new products.

There are over 6,000 general hospitals in the United States with about 900,000 beds. Hospital construction expenditures have risen from less than $1.0 billion in 1959 to an estimated total of $2,5 billion in 1969.

Growth of hospital expenditures has averaged 10.5 percent annually since 1960, with the rate accelerating to 12.0 percent in the past few

years. The recent increase is largely in response to demand increases resulting from the growth of public and private insurance coverage.

Excluding construction expenditures, which were in excess of $2 billion, hospitals spent approximately a billion dollars on medical supplies and equipment in 1967.[1] These expenditures account for about 6.5 percent of a typical general hospital's total expenditures. The growing use of disposable products is an important factor in the market. Hospitals have found that it is more economical to use an item once and dispose of it than to sterilize and re-use it. Some of the products in this category are surgical gloves, syringes and needles, kits for various operations, and bed linen. In 1950, about $14 million was spent on disposable products; by 1960, purchases were up to $200 million and they are expected to exceed $300 million by 1971.

Sales of medical electronic equipment were approximately $350 million in 1967, with most of the sales going to hospitals. Types of products include X-ray equipment, cardiac pacemakers, patient-monitoring systems, and electro-cardiographs.

For many years the industry has operated with little external supervision or attention. While the Food and Drug Administration has had responsibility for banning the sale of drugs of doubtful safety or efficacy, its authority over medical equipment has been vague. In 1968, the Second Circuit Court ruled that the Food and Drug Administration does have this authority, and the ruling was upheld by the Supreme Court. The effects of this decision may be broadened if Congress passes a bill that it has before it that requires premarketing clearance of medical devices and instrumentation.[2]

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[1] The Medical Care Industry (New York: Goodbody and Co., 1969), p. 3.

[2] Ibid., p. 5.

Unlike the drug industry, the medical equipment industry has not been conspicuously involved in allegations of noncompetitive behavior. There has only been one anti-trust suit involving a medical company, outside the drug industry, in recent years. It is a relatively minor suit alleging unfair competitive practices.[3]

The lack of specific evidence regarding noncompetitive behavior does not mean that the industry is not characterized by high profits; nor would the existence of such profits by themselves mean that the industry is noncompetitive. Indeed, the fact that new firms have been entering the industry at a rapid rate conforms more with the theoretical expectations of the growth of a competitive rather than a noncompetitive industry. Economic theory also holds that new firms enter an industry in the expectation of profits which exceed returns from alternative ventures. It should be expected, therefore, that the industry is relatively profitable regardless of its competitive structure. Consequently, no necessary connotation of monopolistic behavior may be inferred if the industry's profits are, as hypothesized, found to be substantially greater than those in other manufacturing industries. Such findings could, however, be used to obtain a rough indication of the difference between what is spent on equipment and what might be spent were profits at a more normal rate.

Method of Analysis

The analysis is based on a comparison of the 1967 accounting profits for all manufacturing industries and of a sample of firms engaged primarily in producing medical supplies and equipment.

The cross-sectional approach was adopted because the dynamic characteristics of the industry itself, together with the unusually sharp

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[3]"Standard and Poor's Corp.," Standard Listed Stock Reports, XXXVI (April 18, 1969), 1252.

increases in medical expenditures which started to occur in 1966, violated the essence of Bain's proposals regarding relevance of using long-run profits to estimate short-run theoretical profits.

The sample is composed of ten firms believed to be representative of the industry. Criteria used in making the selection were:

1. That the firms were engaged primarily in producing medical equipment and supplies;
2. that, as a group, the firms produced a complete range of the industry's products;
3. that the firms had been in business a sufficient number of years so that their profits would reflect as stable a situation as possible; and
4. that the firms produced more than half the industry's output.[4]

Satisfaction of the first three criteria was accomplished by referring to company financial statements and related narrative accounts of the companies. The final criterion was satisfied by including in the sample four companies which, in 1963, accounted for 48.3 percent of the value of shipments of surgical and medical instruments and surgical appliances and supplies.[5] It is believed that these companies have been relatively successful in maintaining their market share.

The estimated industry profit rate is derived by calculating for 1967 a weighted average profit rate for the firms in the sample. The weighted average is the sum of firm profits divided by the sum of firm net worths. This method is used to avoid a bias, attributable to diff-

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[4]Sarkar, chap. VII, analyzed the five-year profits of three firms. Subsequent information regarding both the financial status of more firms and the method of analyzing profits enabled the use of a larger sample and a single year in the present study.

[5]U.S. Department of Commerce, Concentration Ratios in the Manufacturing Industry, 1963, pt. II (Washington: Bureau of the Census, 1966), pp. 562-563. Note: More current data which would have been relevant to the criterion would not have been available until publication of the 1968 Census of Manufacturers.

erent sizes of firms, that would enter were an average of individual firm profit rates taken. As Bain has indicated, "In deriving an industry profit rate for any year, it seems obviously appropriate to weight the individual firm ratios according to firm size, since our interest is in the profitability of the total investment in the industry."[6]

The average profit rate for the medical equipment industry will then be compared with the rate for all manufacturers, the same rate as used in the drug industry analysis. Conclusions about the relative profitability of the equipment industry will be based on a subjective interpretation of this comparison.[7]

Analysis

The 1967 net income, equity, and weighted average profit rate for the ten firms comprising the medical equipment industry sample are shown in Table 69.

The table shows a 1967 average profit rate for the ten firms of 13.2 percent. The comparable rate for all manufacturers was 11.7 percent.[8] The difference of 1.5 percentage points is small and insubstantial compared to the 7.0 percentage points difference found for the drug industry. Furthermore, the 1967 profit rate for the instruments and related products industry, of which the medical equipment and supplies industry is a subset, was 17.9 percent.[9] Thus, not only is the difference between the

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[6]Bain, Industrial Organization, p. 311, n.

[7]Statistical testing is precluded by data limitations and the experimental design.

[8]Federal Trade Commission, Quarterly Financial Report.
Note: Sarkar, p. 77, found a 15.0 percent rate for the equipment industry and a 12.0 percent rate for manufacturers.

[9]Federal Trade Commission, Quarterly Financial Report.

TABLE 69.--Profits in the hospital supply industry, 1967

Firm identification	Net income	Stockholders' equity
	Million dollars	Million dollars
A.	28.1	216.4
B.	2.8	15.7
C.	8.8	59.9
D.	19.0	195.6
E.	12.4	108.1
F.	1.9	9.0
G.	41.3	337.5
H.	4.2	20.1
I.	52.4	338.0
J.	3.4	17.1
Total.	174.3	1,315.4

Weighted average profit rate: $\frac{\text{total income}}{\text{total equity}} \times 100 = 13.2$ percent

Source: Income and equity data were obtained from financial statements pertaining to the ten firms.

equipment industry's and all manufacturers' profit rates relatively insignificant, but the industry's profit rate is also substantially less than that earned in comparable enterprises. On the basis of this evidence, the hypothesis of excessive profits must be rejected. Likewise, it would seem inappropriate to suppose that the difference between the equipment industry's and all manufacturers' profit rates could validly be used for measuring abnormal-profit-induced excessive expenditures. Four individual firms had profits in excess of 16.0 percent. However, these were relatively small firms which, together, accounted for only 9.0 percent of the sales of all the firms in the sample.

As noted earlier in chapter five, the percentage of current hospital expenditures allocated to medical equipment and supplies is small. Undoubtedly, large expenditures are initially incurred in construction. In this case, if excessive profits were earned in the industry, they would be capitalized into a hospital's amortization payments and increase them; and, consequently, the cost of hospital care. However, on the basis of this chapter's findings there can be little reason for believing that this has occurred.

CHAPTER XII

EFFICIENCY IN THE DISTRIBUTION AND UTILIZATION OF HOSPITAL SERVICES

Introduction

General hospitals are to a region what the single hospital is to a community, the nucleus of the medical complex. Most hospitals perform outstanding services, but one may legitimately query whether there are inefficiencies in the hospital system which create needless costs, and hence, wasted resources.

In recent years several studies have indicated that defective internal and external organization of hospitals and hospital systems have contributed to the rapidly rising cost of hospital care.[1]

A theme common to many of these studies is the allegation that hospital administrators lack incentives to reduce production costs. Some of the major thrusts of these studies are summarized in the words of Walter Landgraff, who stated that:

> In the voluntary hospital, as in many other social and political institutions of a nonprofit nature where survival and productivity are not related to the cost-efficiency factors, there has been no incentive or need to effect warranted changes in concept, organization, and operations; and to eliminate the expensive vestiges of past usefulness![2]

Some of these problems are an outgrowth of the fact that, in the past, decisions regarding size and location of hospitals have been based

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[1]Note: In the period 1957-59 through 1967 indices of consumer prices and hospital room rates rose 16.3 percent and 100.1 percent, respectively. 1968 Source Book of Health Insurance Data, pp. 57-60.

[2]Landgraff, Harvard Business Review, pp. 75-76.

primarily on local aspirations and needs, while considerations regarding area needs or cooperation with other hospitals have often been treated indifferently. An unfortunate outcome is a national hospital network marked by excess facilities in some areas and shortages in others.

Combating these inefficiencies is one of the functions of regional hospital planning which

> ...is concerned with the consolidation and coordination of facilities and services in the interest of the best possible standard of care for the patient, savings in capital investment and operating costs to the community and efficient use of personnel.[3]

In Michigan, two operational criteria are the division of the state into major hospital regions and the subdivision of these into hospital service areas. The approach is designed to assure each service area's population access to adequate local hospital facilities and referral to regional centers.

The objective of this chapter is to gain a general perspective on the efficiency with which general hospital resources are developed and used in the Grand Traverse Region. Four topics will be discussed: the availability and distribution of hospital beds; the shape of the hospitals' long-run average cost curve; the comparison of the region's short-run average hospital costs with such costs in similar hospitals elsewhere; and the question of how the quantity and quality of services affect the use of the hospitals.

The Distribution of Beds

The analytical approach used here is to test the actual 1967 distribution of hospital beds against two alternative distributions: one,

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[3]Michigan Department of Public Health, Michigan State Plan for Hospital and Medical Facilities Construction, 1966-67, p. 3.

a statistically derived optimum, and the other, the distribution suggested in the Michigan State Plan. Because the distribution of the beds can be viewed from the perspective of individual hospital requirements, total regional requirements, or subregional requirements, three organizational systems are utilized with the tests. That is, with seven hospitals in the region, the hospital structure can be considered as composed of seven separate units, seven cooperating units, or some number of cooperating units less than seven.

It is desired to find which bed distribution by organizational structure minimizes the number of hospital beds, and thereby to determine whether the hospital system could have been designed better, from the point of view of providing an equivalent output of services (measured in patient days) for a smaller investment in hospital structures. Should it be found that one or more alternatives were able to provide the same patient care with significantly fewer beds, it will be taken as evidence of a probable misallocation of resources. On the other hand, should it be found that the number of beds in the existing system approximated some measure of optimality, it will be concluded that in this respect, the hospitals were performing efficiently.

The statistically derived optimum distribution is based on the measure usually employed to determine whether a hospital's size adequately provides for expected needs. This measure, the hospital's occupancy rate (OR), is defined as the number of beds used as a percentage of beds available. It may vary according to changing demand conditions, yet it is usuall regarded as fairly predictable. A 100 percent OR would imply that all the beds in a hospital were being used every day over a given period, usually a year; a 50 percent rate would imply that only half the bed capacity was u

In fact, hospitals rarely attain full occupancy; in order to permit emergency accommodation, an 80 percent OR is usually regarded as the maximum, reasonable, normal capacity. A sustained higher rate places a hospital into a "critically overcrowded" classification and can lead to the hospital obtaining a high priority rating for expansion. In Michigan, desirable occupancy rates are determined by state and local authorities in accordance with state and federal guidelines. The essence of the approach is to distribute facilities of the right size to meet existing and expected demands in different geographic areas.

Optimization with Separate Hospitals

It may be helpful to start with the assumption that an 80 percent occupancy rate, mentioned above as the maximum, normal rate, represents optimum hospital use and to consider the hospitals as relatively separate, b not totally independent entities.[4] The focus will be on determining the performance of each hospital relative to the 80 percent norm.

Occupancy rates in the five larger hospitals either slightly exceeded 80.0 percent or were close enough to represent significant underoccupancy (Table 19, p. 67). The two smaller hospitals had occupancy rates of 58.3 percent and 66.1 percent. To obtain 80.0 percent rates in these hospitals, the number of beds should have been less. Kalkaska's hospital, which had 20 beds and 4,259 patient days, needed only 15 beds to obtain the 80 percent OR; Leelanau's with 29 beds and 6,995 patient

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[4]Hospital planners have traditionally regarded 80 percent as the optimum occupancy rate. Klarman has pointed out, however, that 85 percent is more in line with current thinking; The Economics of Health, p. 125. The lower rate is used here because it appears to be more consistent with rates used by Michigan hospital planning authorities.

days, would have had an optimum rate with 24 beds.[5] This means that, according to the criteria used, there were actually only 10 excess beds in the region in 1967, five in each small hospital. This is a small number from which to draw hard conclusions about underutilization. Moreover, it is predicated on an overly stringent assumption of independence. As will be seen in the next sections, where there is substitution among hospitals, as there is in fact in the region, patient transfers could be used to adjust a small differential such as this.[6]

Optimization with a Regional Cooperative System

One of the most widely held views in hospital planning and medical economics is that hospital costs would be lower were there greater cooperation among hospitals in the same area. Because maximum patient demands are unlikely to occur in all hospitals at once, the census for a single large hospital--serving the same population as several hospitals--would vary less than for individual hospitals. This means that fewer beds would be needed in the large hospital to provide the same level of protection as could be provided with a given number of beds in several independent hospitals.[7] As an independent unit a hospital must have the capacity, in terms of staff and equipment, to handle its own maximum load. In cooperation, however, each hospital would require less staff and equip-

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[5]The optimum number of beds is calculated by converting patient days into an average daily census figure and dividing by .80:
optimum number of beds = $\frac{\text{patient days}}{365} \div (.80)$.

[6]Large hospitals tend to offer more services than small hospitals; for many of these services the small hospital is an unsatisfactory substitute, but as may be seen later, there are other services which can be adequately provided at both large and small hospitals.

[7]Long, The Economics of Health and Medical Care, p. 214.

ment because patients could be readily transferred to other hospitals in case of emergency demands or demands for specialized treatment.

The regional cooperative model can be designed two ways: one large hospital; or a number of hospitals whose total beds could equal those needed for one large hospital if they cooperated fully with each other by being open to all patients and by avoiding unnecessary duplication of services.

The implications of cooperation for bed saving are demonstrable statistically. The average daily census in the region's hospitals in 1967 was 489 patients. It may be assumed that the demand for hospital facilities has a Poisson distribution.[8] Hence, a single large hospital, or a group of fully cooperative hospitals, with 577 beds ($489 + 4\sqrt{489}$) could meet expected needs with the probability of .0001 that demands would exceed 577 on any given day. The expected occupancy for either system would range from 401 to 577 patients and the normal occupancy rate would be 84.7 percent. Since the actual number of beds was 611, this result shows that there were 34 potentially excess beds in the region in 1967. If, at the opposite extreme to full cooperation (or one large hospital), there were complete independence, each hospital would have to allow for overcrowding. As shown in table 70, total bed needs would rise to 857, and the normal occupancy rate for the group of hospitals would be 39.2 percent.[9]

This analysis shows that it takes 857 beds for 7 hospitals operating independently to provide the same level of service as one 577-bed system. With 577 beds the OR would be 84.7 percent. The actual rate, with 611 beds,

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[8] Ibid.

[9] This analysis helps explain observed low occupancy rates in small hospitals. For example, in the 20-bed Kalkaska hospital, the average daily census was 11.7. Were it an isolated hospital, it would need, to guard against a .0001 probability of overcrowding, a total of 38 beds. With this number of beds, the normal occupancy rate would have been 30.8

TABLE 70.--Number of beds in the Grand Traverse Region's general hospitals, 1967, and the number needed if each hospital were completely independent

Hospital location	Actual number of beds	Number of beds needed[a]
Benzie	43	69
Crawford	68	101
Grand Traverse	250	313
Grand Traverse	73	107
Kalkaska	20	38
Leelanau	29	56
Wexford	128	173
Total	611	857

[a]Calculated as bed needs = $\mu + 4\sqrt{\mu}$, where μ = the actual number of beds.

was 80.0 percent. Hence, this example does use a more stringent occupancy criterion than that actually applicable. The disadvantage of a cooperative system whether it is one large hospital or a group of hospitals, is that it would mean extra traveling costs for patients, visitors, and medical personnel.[10] The Grand Traverse Region, however, is lightly populated, fairly compact, and laced by an adequate road network. Therefore, it probably possesses the major physical characteristics for the implementation of a cooperative system. Furthermore, the region is served by remarkably adequate hospital facilities so conceptually, the system could be implemented within the framework of the existing structure, provided the full degree of needed cooperation were forthcoming.

The model is useful for its ability to demonstrate the benefits of cooperation in terms of savings in bed needs. As such it can form a useful base for analysis of hospital needs particularly in rural areas, for they tend to have relatively more underutilized hospital beds than do urban areas. Assumptions of the model also show that the earlier analysis, based strictly on established optimum OR rates, contains an invalid "independence" assumption. There it was shown that the number of beds was close to actual needs; this section shows that if the hospitals were independent, they would need many more beds to guard against the risk of overcrowding. It seems therefore that the hospitals are not independent; and it is concluded that the 611 beds and an 80 percent criterion reflect efficient cooperation among the seven, and that little further efficiency may be gained from increased cooperation. To see how closely these conclusions predict the actual situation in the region, the following

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[10]When more than one hospital is involved in the system this is attributable mainly to the degree of cross regional referral necessitated by the division of specialized services among the hospitals.

material discusses 1967 and future bed needs as determined by state planning authorities.

Optimization with a Subregional Cooperative System

Details of the approach actually planned for the region are contained in the Michigan State Plan. It is based on essentially the same patient data as used in the previous analyses but also allows for population growth until 1973. The fundamental difference from the previously discussed systems is that it is predicated on the needs of the region's four hospital service areas. The elements of this system were outlined earlier on page 47. Basically they were that each subregion should be designated as a hospital service area to be served by one adequate hospital or by cooperation among hospitals where more than one is present.

The region's hospital service areas are: Frankfort, Grayling, Cadillac, and Traverse City. Each of the first three is served by a single hospital. The Traverse City area is served by four, two in Traverse City and one each in Leelanau and Kalkaska Counties.

The number of beds existing in 1967 and the number needed to provide adequate hospital care for the population using the service areas in 1967-73 are shown in Table 71.

On an overall regional basis, the table shows a bed deficiency. But in the present context of subregional or service area needs, the Cadillac, Frankfort, and Grayling areas had too few beds, while the Traverse City area had too many.

In 1967 the percentage occupancy rates in the three deficient areas were 81.2, 78.6, and 82.8, respectively (see Table 19, p. 67). Hence, while more beds need to be provided during 1967-73, it seems

TABLE 71.--Number of hospital beds in the Grand Traverse Region's hospital service areas, 1967, and projections for 1967-73

Hospital service area	Number of beds, 1967	Number of beds needed, 1967-73
Cadillac.	128	134
Frankfort	43	50
Grayling.	68	77
Traverse City	372	364
Total	611	625

Note: Bed needs are determined for each service area by the formula: bed needs = $\frac{\text{projected average daily census}}{80}$ + 10. The projected census is based on current (1967) patient days weighted by expected (1973) patient days. The actual number of beds is based primarily on data in Hospitals, and is less than the number reported in the Michigan State Plan.

reasonable to conclude that these areas were almost optimally supplied with hospital beds as of 1967.

The Traverse City service area, on the other hand, had eight excess beds. But since the area occupancy rate was 79.3 percent [11] (a mere 1.7 percentage points less than the 81.0 percent occupancy rate that would have occurred had the optimum number of 364 beds been available), no more can reasonably be gained from debating relative optimalities in this subregion on the basis of eight excess beds than could be gained from the finding of ten excess beds in the first analysis. It should be pointed out, however, that the need for more beds during 1967-73 can probably be accommodated assuming the hospitals continue their cooperation with each other. Only 14 extra beds are needed to provide adequate services in the three areas outside Traverse City. It seems reasonable to assume, the unlikely event that the whole region experienced a major emergency aside, that excess demands, which might affect one or more of the three areas, could actually be satisfied by utilizing either the hospitals in Traverse City or in one of the other areas. In conclusion, therefore, it is probably fair to say that there is no evidence to suggest that the cost of hospital care in the region is increased by the presence of an excessive number of beds.

Economies of Scale

Turning now to the second point in the discussion of hospital services: Through economies of scale, could fewer but larger hospitals serve the region's needs more efficiently than the existing structure?

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[11] Obtained by adding the number of patient days for the four hospitals (107,627), converting to an average daily census (107,627 ÷ 365 = 295), and expressing the result as a percentage of the number of beds $(\frac{295}{372} \times 100) = 79.3$ percent.

The rationale for supposing such a possibility differs from the previous section's implicit rationale that because the census for one large hospital or for a group of hospitals acting as one would vary less than for independent hospitals, less beds would be needed. Rather, here, the rationale is based on findings of economies of scale in hospitals.

Paul Feldstein, in a study of 60 hospitals ranging in size from 48 to 453 beds, found that for long-run adjustments to variations in patient load, the long-run average cost curve was falling throughout the whole range of hospitals included in the study.[12] As a result he was able to conclude that lower costs could be obtained were the size and output of hospitals increased.[13] The implication of this finding, for areas suited to the construction of one large hospital, is that with increased use the total cost of hospital care could be reduced by increasing the size of existing hospitals rather than by building new ones.[14]

Although, as shown in the preceding section, the Grand Traverse Region appears to have sufficient beds to meet present and expected needs, a perspective on the efficiency with which they meet the needs may be gained by considering the relation between their costs and hospital size along the lines suggested by Feldstein. Should they, as did the hospitals in the Feldstein study, exhibit increasing returns it may be possible to show that the cost of hospital care in the region exceeds that

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[12]Paul J. Feldstein, An Empirical Investigation of the Marginal Cost of Hospital Services (Chicago: University of Chicago Graduate Program in Hospital Administration, 1969), pp. 60-64.

[13]Klarman, The Economics of Health, p. 107, takes note of other studies which have found a typical U-shaped cost curve. He points out that the discrepancy between these and Feldstein findings may result from Feldstein's removal of the influence of size or the rate of occupancy by the substitution of patient days for bed capacity.

[14]Feldstein, An Empirical Investigation, p. 64.

which might have been possible had, at some time in the past, a decision been made to centralize hospital facilities.

In Figure 6 the total operating expense of each hospital is plotted against the number of patient days for the year 1967.[15]

The small sample size limits the possibilities of developing statistically significant relationships from these observations. Nevertheless, they appear to lie in an approximately linear pattern, which agrees with Feldstein's findings. On observation it also seems likely that a least squares line fitted to the observations would pass close to, if not through, the origin.

To check this possibility, an equation fitted to the data with an assumed zero intercept gave the following results:

$$Y = \$48.76\ PD$$
$$R = .92$$

where:

Y = total cost
PD = number of patient days

Because there is no constant term, marginal cost is equal to average cost. Hence, for size of hospitals included in the sample of seven the average cost curve is constant, and the hospitals in the sample are in the range of constant returns.[16]

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[15]An alternative technique would have been to plot average cost per patient day against hospital size, but because size would have to include the number of services offered and the nature of the hospital as a teaching or a research institution, as well as the number of beds, it cannot be adequately represented by any one variable. And though these other variables may be correlated with the number of beds, the number of beds is highly correlated with the number of patient days. Feldstein, p. 62.

[16]These findings differ from Feldstein's in that he found slightly increasing returns; nevertheless, the equation used here fits the data approximately as well as Feldstein's--the R value in each study being .92.

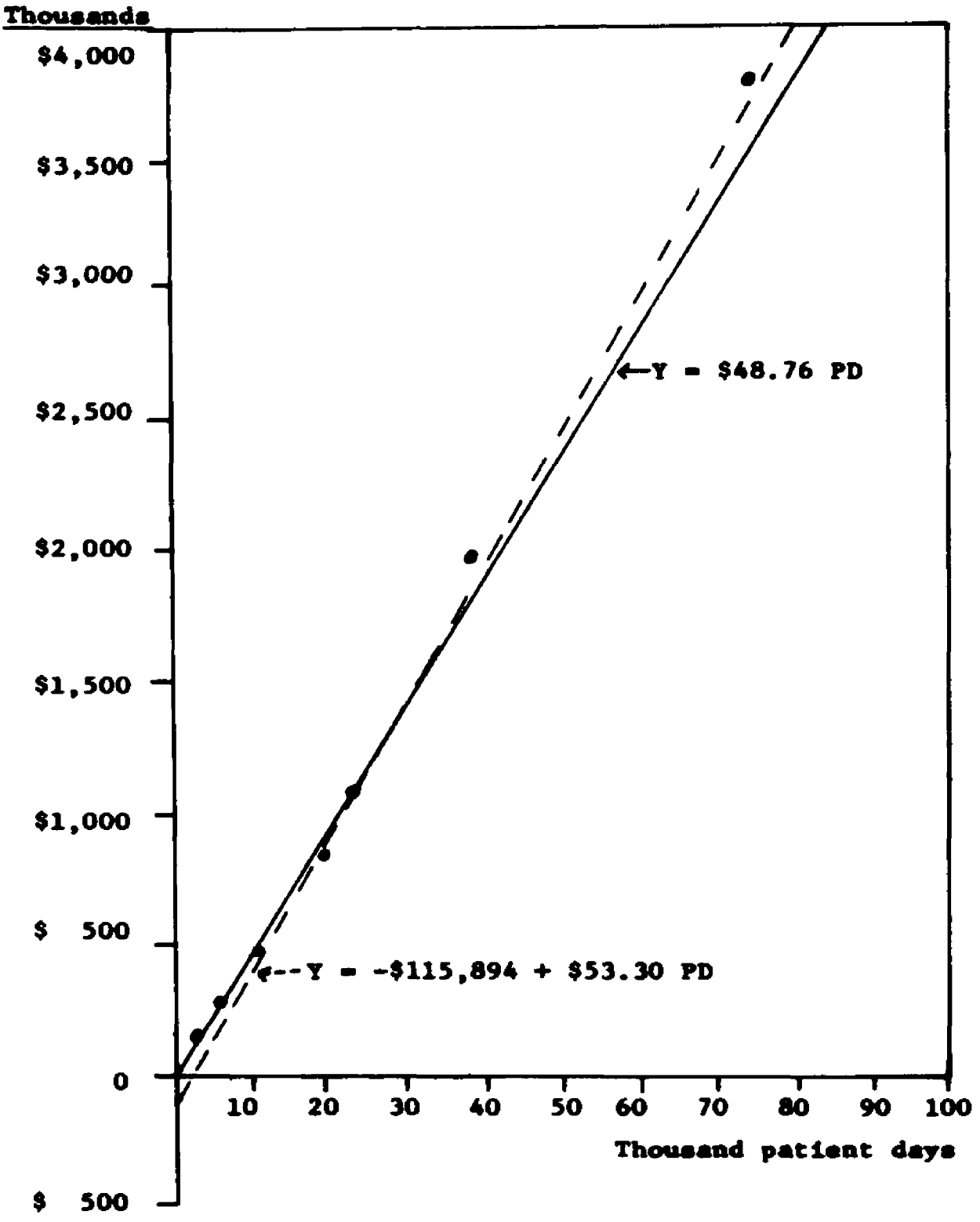

FIGURE 6.--The relationship between total operating expense and patient days in the Grand Traverse Region general hospitals

A nonrestricted linear equation fitted to the same data gave the following results:

$$Y = -\$115,894 + \$53.30\ PD$$
$$R = .99$$

This equation fits the data better than the restricted equation but it suggests slightly increasing costs. Given the small sample and simple assumptions used here the results of either equation should be treated with a degree of caution. Nevertheless, increasing returns are not conformable with results of other findings, including Feldstein's about hospitals in this size range. For this reason the first equation appears to present more realistic results and is therefore, preferred for this analysis.

Feldstein's study suggested some economies of scale and concluded that larger hospitals might result in some savings. The evidence based on a sample of hospitals in the Grand Traverse Region gives reason to prefer an assumption of constant returns rather than decreasing costs. There is, therefore, no basis for concluding that costs could be reduced or would have been lower were greater attention paid to the scale of the region's hospitals.

Short-run Costs

The previous section examines the possibility of reducing the cost of hospital care through utilizing advantages of economies of scale. However, the findings of constant or possibly increasing cost negated this approach. The focus is now turned to a further possibility of reducing average costs.

That is, without diminishing the quality of care, are there possibilities of short-run modifications, such as changes in production techniques or factor costs, that would enable the hospitals to produce an unchanged output, but at a lower cost?

A thorough study of this question is beyond the scope of this paper and would require detailed research into the operation of the region's hospitals. The emphasis here will be placed only on a general indicator and conclusions will be drawn with respect to the information it provides.

The region's hospitals are classified as short-term general hospitals. Average cost per patient day in 1967 was $48.76. Under the assumption that the hospitals are a representative sample of similar hospitals in Michigan and the U.S. and that on the average there is no difference in the quality of care, it should be possible by comparing regional costs and other data with that from similar hospitals to gain a rough perspective of how efficiently hospital care is provided in the region, relative to other areas. In order to maintain the concept of a regional hospital system serving a given population, the hospitals will be treated as a group. In other words, comparisons will not be drawn about particular hospitals. Hence, it will not be possible to conclude that one hospital in the region is "better" or "worse" than another hospital in or outside the region.[17]

Relevant data for the region, the state, and the U.S. is given in Table 72.

Average costs are significantly lower in the region than in the state or nation. The number of personnel used is lower than in the state and approximately the same as in the nation. The difference in

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[17]This approach differs from Sarkar's which was to rank the Copper Country hospitals by order of efficiency. However, the Copper Country is about the same size as the Grand Traverse Region, but only half as densely populated; hence, the hospitals, of which there are fewer than in the Grand Traverse Region, do not comprise a similar sort of homogeneous system. As a result there is less patient movement among the hospitals and, therefore, more to be gained from treating the hospitals individually. Sarkar, pp. 84-99.

TABLE 72.--Average costs, personnel, and length of stay in short-term general hospitals in the Grand Traverse Region, Michigan and the U.S., 1967

Item	Region	State	U.S.
Cost per patient day. . . .	48.76	59.22	54.08
Number of personnel per 100 census[a]	264	271	265
Length of patient stay per patient (days).	8.5	8.5	8.3

[a]Census refers to the average number of patients treated on a given day.

Source: Hospitals, Journal of the American Hospital Association, XLII (August, 1968), 454-458; and Michigan State Plan.

costs between the state and the nation is partially attributable to the extra personnel used in the state. But this does not explain the difference in cost between the region and the nation or state; furthermore, the difference cannot be attributed to length of patient stay because these are equal for the region and the state, and barely less in the nation. It seems, therefore, that the region's hospitals provide hospital care at lower cost than in other areas; hence, for an assumed quality of care that is comparable to the average quality in Michigan or the United States, it is concluded that in this respect, too, the Grand Traverse Region's hospital system is relatively efficient.

The Quantity and Quality of Hospital Services

It is a generally accepted norm that a positive relationship exists between a hospitals' size, measured in bed numbers, and the quantity and quality of medical services it provides. The quantity of services is measured by the number of different medical functions a hospital is equipped to provide; and the quality of care is usually regarded in terms of a hospitals' accreditation, medical school affiliation, training programs for interns and residents, staff qualifications, and with the number and sophistication of its services. As may be expected, these quality factors tend to be more closely associated with large hospitals than with small hospitals.

The Grand Traverse Region's hospitals clearly follow the norm in terms of the quantity of services, as the number provided ranges upward from two in the smallest hospital to nine in the largest. And, if indeed quality of care is related to the factors mentioned above, then there is also reason for supposing that the larger hospitals are better equipped to provide quality care.

Because the larger hospitals offer more services, it may be expected that this would increase their costs. Figure 6 shows that the larger hospitals do have higher total costs than smaller hospitals, but as size increases average costs, rather than declining as Feldstein found, increase slightly or, as we have assumed, remain constant.[18] But, in deriving these relationships no explicit allowances were made for the quantity or quality of services. So it would seem that gains from more and better services are only partially or not at all offset by increasing costs.

The implication of this is that were allowances made for the quantity and quality of services, total costs would probably increase at a decreasing rate. In this respect, then, there may be some advantages to larger hospitals; they can offer better quality care and more services than the smaller ones. A patient faced with a choice between a large and a small hospital, with everything besides the quantity and quality of services equal, may be expected to choose the larger hospital. And this is the observed pattern of behavior in the Grand Traverse Region, where, as shown in Table 19 (page 67), rates of use increase with hospital size. Nevertheless, it also means that when other things vary, such as time and distance, which can be particularly expensive for a farmer and his family, there may be advantages to a network of hospitals, whereby, at least for simple disorders, adequate health care can readily be obtained in small facilities. Thus on this count, too, as with the other indicators previously discussed, it may be concluded that hospitals in the region are reasonably efficient.

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[18] Feldstein, An Empirical Investigation, p. 64.

Summary

Four subjects have been covered in this appraisal of the adequacy of hospital services in the Grand Traverse Region. The actual number of beds in 1967 was found to conform closely with optimum requirements and, although in some areas additional beds were needed to fulfill projected 1973 requirements, it was felt that these needs could probably be met with existing facilities provided there was sufficient cooperation among the hospitals. A limited analysis of the hospitals' long-run average costs showed that average costs were constant and equal to marginal costs. Hence, there appeared to be no reason for concluding that fewer, larger facilities would provide services more economically than the existing facilities. When compared with short-run average costs in similar hospitals in other areas, the region's costs were found to be lower. Hence, there appeared to be little reason for supposing that operational inefficiencies were responsible for abnormally high costs. Finally, it was indicated that some of the higher total costs in large hospitals can be attributed to their ability to offer more and better services than do small hospitals. This ability appears to be recognized by patients in the region because hospital occupancy rates increase with hospital size. Nevertheless, when other factors such as traveling costs are included, the advantages of readily accessible small hospitals become more apparent.

In summary, the four subjects considered in this chapter indicate that the region is served by a relatively adequate and reasonably efficiently operated network of hospital facilities.

CHAPTER XIII

REVIEW AND IMPLICATIONS

This chapter's primary objective is to review the information already learned about the Grand Traverse Region's medical industry and merge it into an appraisal of the medical sector's performance in meeting the region's health needs.

Review

The eight counties comprising the Grand Traverse Region contain a fairly stable population of approximately 100,000 people. The economy is supported mainly by the tourist industry, fruit farming, some manufacturing, and, as shown in this study, a medical industry. Because of these activities the region evinces a relatively prosperous appearance. This point was emphasized by Sarkar in his study of the medical industry in the Copper Country, in which he drew a vivid contrast between the economi conditions of the two regions.[1]

It is indeed true that the Grand Traverse Region is wealthier, more urbanized, and endowed with better medical facilities than many rural areas. This, however, should not be construed as implying that the region is nonrural or affluent. Possibly the one feature that does distinguish it from its essential rurality is its medical industry. In this respect it compares favorably with affluent urban areas. But in many respects, unfavorable but not uncommon rural characteristics predominate.

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[1]Sarkar, p. 6.

Some of these are low per capita incomes, high unemployment, lack of population growth, and a high proportion of elderly people.

It is quite important to understand how an urban medical industry has been able to flourish in a rural area. The answer may provide useful clues towards solving problems in areas with relatively inadequate medical services. While the present study only addresses this question indirectly, the findings do have an important bearing upon it. What was attempted was to consider the industry as a regional economic entity, to estimate and describe the income and expenditure flows connecting its elements, and to make some judgments about the efficiency with which its services were produced.

Traverse City, an attractive resort with a residential population of 20,000 and located at the southern end of Grand Traverse Bay, is an established medical center. The city's medical significance derives from the presence of a state psychiatric hospital and the progressive transformation of a general hospital into a comprehensive medical center known as the Munson Medical Center. It is composed of a fully accredited general hospital with a bed capacity of over 200; an extended care facility that is fully coordinated with the hospital; and a children's clinic, through which the center is affiliated with the University of Michigan for intern and resident training in pediatrics. Munson's facilities and its significant open staff policy, by which all qualified physicians in the area may use its facilities, have helped attract a highly qualified corps of specialized medical professionals into the region. To many of these professionals, the region offers the advantages of practicing in an advanced medical environment without the disadvantages of heavily urbanized surroundings.

A recent addition to Traverse City's medical complex is a fairly new 78-bed osteopathic hospital. A favorable attitude towards osteopathy and an appreciation of an adequate medical sector's value, have enabled osteopathic medicine to play an important role in the development of the region's medical industry. In addition to these hospitals in Grand Traverse County, there are general hospitals, ranging in size from 20 to 138 beds, in six other counties. Emphasis has also been placed on the special needs of the region's large elderly population. This subject has received special attention since the inception of Medicare and has resulted in the growth of an impressive network of extended care facilities.

Medical facilities and professionals cannot, however, exist in an economic vacuum. A region's ability to support its medical structure is very much dependent on adequate financing. This subject has been the focus of a large part of the present study. The financial structure of the region's medical industry was examined in a framework which traced the flow of expenditures from the consuming sector (private consumers, government, and philanthropy) into the incomes of the producing sector (doctors, dentists, hospitals, nursing homes, etc.) and then from the producing sector into expenditures on human and nonhuman inputs.

This framework was developed in the context of a regional-non-regional model. The reason for this approach derived from observations that the producing sector attracted patients from a wider geographic area than the eight counties, that a large share of its income was obtained from the federal and state governments, and that some proportion of these incomes was redirected to input suppliers located outside the region. Utilization of this approach made it possible to isolate the total cost

of producing the region's medical services and show the net results of inflows and outflows of expenditures. Inflows were felt to be especially important for their economic impact. Because they represent externally originating payments for a part of the region's production of medical services, they represent a net addition to the region's income and export receipts. But, in turn, the impact of these payments would be diminished if they were found to be largely respent by the producing sector for externally produced inputs.

In the period studied, the calendar year 1967, total income of the region's medical producing sector was approximately $33,500,000. Of this, external funds were estimated to have paid 50.1 percent and regional funds 49.9 percent. Admittedly, nearly all the psychiatric hospital's seven and a half million dollar budget was paid from external funds. This clearly influenced the regional payments pattern in a manner that would rarely be duplicated in other rural areas. Nevertheless, removal of this factor from the accounting framework still left the industry with more than a third of its income coming from external sources. Excluding consideration of the psychiatric hospital, the main sources of this external income were the federal government and nonregional private consumers. Federal payments were largely represented by Medicare reimbursements which, incidentally, were greatly in excess of premiums collected from the region. Private payments came mainly from patients living in nearby counties that were dependent on the specialized services available at the Munson Center, from tourists, and from seasonal workers.

Including the psychiatric hospital's income, the total amount received from external sources was nearly $17,000,000. But when the analysis was shifted to the input structure, it was found that 78.5

percent of the producing sector's income was spent on regionally purchased inputs and only 21.5 percent on nonregionally purchased inputs. This left the region with some seven and a half million dollars representing the excess of externally originating income over external expenditures.

Some attention was paid to the economic impact of these income flows on the labor market. The production of most medical services is quite labor intensive. It was found that, including remunerations to the self-employed, the region's producers spent some 62.8 percent of their income on wages and salaries. The number of people employed in the industry was in excess of 3,200 and though a large share of the earnings did represent the income of relatively few self-employed professionals, many jobs were made available at around the region's average wage.

When these employment data were compared with data for other industries, it was found that the medical industry had one of the largest payrolls and was one of the largest full-time employers in the region. This clearly emphasized its relative economic significance.

This discussion provided ample information about the level of expenditures and the industry's economic standing. Little attention was paid to questions about health needs. What was shown was how much was spent for the amount of health care received; that is, the industry's total revenue. Subsequent chapters examined the hypothesis that medical care expenditures in the Grand Traverse Region, in 1967, could have been lower had it not been for identifiable inefficiencies in the production of certain services.

An investigation was made of possible excessive expenditures for medical doctors' services, for ethical drugs, and for medical equipment, and of possible inefficiencies in the production of general hospital services. Evidence of excessive earnings, attributable to noncompetitive market practices, was found in the income structure of doctors and drug manufacturers, but not for equipment manufacturers. Estimated excess earnings of doctors and druggists combined have an upper bound of $709,315 and a lower bound of $225,582. These estimates range from 2.12 to 0.67 percent of the region's total medical income and from about 2.73 to 0.87 percent of the income exclusive of the psychiatric hospital's. They represent excessive medical expenditures attributable to noncompetitive elements in the structure of the medical market.

No evidence of organizational or operational inefficiencies was uncovered in the examination of the region's hospitals. There were approximately the right number of beds to meet demands; the hospitals were producing in a range of constant costs; average costs were lower than in comparable hospitals elsewhere; and it was found that though costs increased constantly with hospital size, the number and quality of services also increased. This indicated that in addition to health advantages there were economic advantages to larger hospitals not uncovered in the earlier analyses. These advantages, may, nevertheless, have been recognized by the patients in that the hospitals' occupancy rates also increased with size. Though there may be a need for some greater cooperation among the hospitals in the future if they are to avoid adding more beds, it would seem, on the basis of the evidence presented, that the hospital system is reasonably efficient.

Unmet Needs

Evidence of excessive earnings implicitly confirmed the supposition that health service purchasers spent more money than was necessary for the amount of care received. Despite this, it is reasonable to expect that some greater output of medical care was, in fact, desirable, conceivably to fulfill real but unmet medical demands of the needy. Increases in the output of medical services needed to fulfill these unmet demands could, under "normal" supply and demand conditions, be obtained by increasing the needy's real incomes. Various income maintenance and subsidized medical care schemes can be used for this purpose. This policy would have the short-run effect of increasing the quantity of medical services supplied, but would also increase medical incomes and prices to the nonsubsidized members of the population.[2]

The alternative, but undoubtedly longer run, approach is to increase the supply of medical services. This, assuming a negatively sloped demand curve, would result in lower medical prices. Medical income would change according to the elasticity of demand, increasing if it is elastic and decreasing if it is inelastic. Evidence and experience suggest the likelihood of the latter. Feldstein and Severson, for example, found that price elasticities were 0.2 for physicians and 0.0 for hospitals.[3]

These results bear out the fair expectation that within some reasonable price range, the quantity of major medical services (those of physicians and hospitals) demanded is not too responsive to price changes.

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[2]The increase in medical incomes may have beneficial economic effects in areas like the Grand Traverse Region, but it is unlikely that such incidental effects would weigh heavily in national policy decisions.

[3]Feldstein and Severson, Report of the Commission on the Cost of Medical Care, I, 34-40.

The reason, as Greenberg has indicated, is that most visits to doctors and hospitals are for curative services.[4]

The latter cogently suggests the rather obvious observation that the demand for noncurative care is relatively elastic. As far as the needy are concerned, this largely implies the need for more preventive care. Especially in rural areas, where there is often a scarcity of information and services pertaining to preventive care, the needy are less likely to seek noncrucial medical attention than are their urban counterparts. Even in an area such as the Grand Traverse Region, where essential curative services are readily available, there is a problem in fulfilling needs which, while regarded by individuals as nonessential, may be for the kind of preventive care that can avert later, curative care.

A high rate of private insurance coverage, Medicare and Medicaid programs, and special provisions for migrant workers contribute to heavy demands on the region's medical personnel and facilities. The region's medical complex, however, is heavily concentrated in Traverse City. As a result, there is a tendency for people living in outlying areas to avoid seeking medical attention unless or until their needs become acute. Consequently, Traverse City receives more cases that it would had the patients concerned sought preventive or diagnostic attention earlier.[5]

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[4]Harry I. Greenfield, "Medical Care in the United States: An Economic Work-up," paper presented at meetings of the American Association for the Advancement of Science, Cleveland, Ohio, December 26, 1963, p. 15.

[5]Interview with William Hansen, Assistant Administrator, Munson Medical Center, July, 1968.

Two facts substantiate this view. First, the average rate of hospital admissions for Grand Traverse residents is 157 per 1,000 people while the rate for residents in the surrounding counties is 203 per 1,000; secondly, patients from the outlying areas tend to have longer hospital stays than those from the central area.[6]

The central issue in this problem appears to be the difficulty of getting the affected people in these outlying areas to realize their needs at an early stage. This cannot be accomplished by persuasive programs designed to alert these people of their need for regular medical attention, if the programs also mean the necessity of traveling to Traverse City. Most of the people in the outlying areas are members of farm families. As discussed at the beginning of this study, farm residents receive less health care than other residential groups. Low incomes and lack of insurance coverage have commonly been used to explain this situation. But nowadays the effects of these have been diminished, at least in Michigan. A more relevant explanation is the lack of accessibility. In its usual presentation the problem is expressed in terms of so many miles or so much traveling time. But this is only part of the explanation. The other part is the problem of distance as seen by the farmer in terms of what he conceives as the opportunity cost of receiving medical attention. Simple physical isolation is not a problem in the Grand Traverse Region. The problem is to persuade the farm population that it makes economic sense to obtain medical attention whether or not the need is felt. This cannot necessarily be accomplished by increasing the centralization of services in Traverse City. A farmer or

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[6]Michigan Department of Public Health, Michigan State Plan, 1968-69, pp. 175-181.

a member of his family may be persuaded to visit his local physician, someone he knows and can communicate with, and someone who is within easy and, therefore, economic reach. He may be less easily persuaded to visit Traverse City. Most of the physicians in Traverse City are specialists. They may either require referral or be regarded by farm people as impersonal and expensive, and therefore, to be avoided--particularly, when the cost also involves the additional traveling time of going to Traverse City instead of the local town.

All these factors affect the opportunity cost of receiving adequate health care and thus the value a relatively isolated person places on health care. If the cost as he sees it is greater than the return as he sees it, he may very well do without medical attention. This may actually prove more expensive in the long run, but in terms of short-run maximizing criteria, the approach has degrees of rationality.

The solution to the problem is to place more medical services within easy access of the people living in the outlying areas. This does not mean placing facilities such as hospitals in every small town. This solution was tried in the early post-war period and, as was shown in the previous chapter, actually represented a serious misallocation of resources. The real need is for more health personnel such as general practitioners, dentists, and nurses. These are the producers to whom most people turn in case of need. Were there more available in the region's outlying areas, not only would the pressure on Traverse City be relaxed but the health standards of the isolated population would be raised.

Physicians

The most critical need in terms of fulfilling urgent health needs is to increase the number of general practitioners. There were 37 general practitioners in the region in 1967. Of these, 18 were located in Grand Traverse and Wexford Counties, and 19 were located in the six isolated rural counties. Population-to-general practitioner ratios for the individual counties are shown in Table 73.

Relevant ratios are those in the six isolated rural counties. While the ratios are actually lowest in the more urban Grand Traverse and Wexford Counties, their populations are less sparsely distributed, have higher incomes, and furthermore, have easier access to a larger supply of substitute services than do the populations in the six really rural counties.

The critical question to be asked about the six counties is, how many additional general practitioners are needed to assure the availability of an adequate supply of services? To obtain an answer, it is necessary to consider the needs of the total region and the availability of substitute services. In the first place, the population actually using the region's doctors services on a regular basis was estimated to have been 110,400 (page 125). This includes both the region's residential and visiting populations. It is against this actual population that physician needs must be balanced if it is to be assumed that the region is the regular source of supply for a nonregional population. Secondly, in addition to 37 general practitioners there were 91 specialists (M.D.'s) and 27 osteopathic physicians in the region. Thus, there were altogether 155 physicians serving the actual population.

TABLE 73.--Distribution of general practitioners (M.D.'s) and population in the Grand Traverse Region, 1967

County	Population	General practitioners	General practitioners per 100,000 people
		Number	
Isolated rural counties:			
Antrim	9,000	4	44.4
Benzie	7,900	4	50.6
Crawford	5,400	2	37.0
Kalkaska	4,600	3	65.2
Leelanau	9,600	4	41.6
Missaukee	6,300	2	31.7
Isolated semi-rural counties:			
Grand Traverse	37,000	13	35.1
Wexford	17,700	5	28.2
Region	97,500	37	37.9

One of the questions confronting a 1959 Consultant Group on Medical Education was to find out if and how the nation could be supplied with adequate numbers of well-qualified physicians. The group found that demands were going to increase so much that to maintain existing levels of physician supply over the years ahead was clearly enough of a challenge in itself that no additional help could be obtained. Instead of developing a sophisticated index of need, the group set maintenance of the 1959 ratio of 141 physicians per 100,000 people as both feasible and reasonable and conforming to the minimum number required to provide adequate care.[7]

On the basis of a population of 110,400, the region needed, according to the group's criterion, a minimum of 155.7 physicians $\left(\frac{110,400 \times 141}{100,000}\right)$. Since this is only 0.7 more physicians than the actual number, it seems reasonable to conclude that the region actually had just enough physicians to meet the minimum standard necessary to serve the total population. But the major factor behind this favorable position was the large number of specialists in Traverse City. The original problem regarding the outlying areas is not solved by the region as a whole maintaining the minimum standard, if most of the physicians are, in some manner, relatively inaccessible.

A better idea of adequacy in the six isolated rural counties themselves can be obtained by considering the number of general practitioners needed to serve their populations at the minimum level.

In 1967 the average patient in the United States visited a specialist as often as he visited a general practitioner. Let it be assumed,

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[7] Report of the National Advisory Commission on Health Manpower, II, 272-273.

therefore, that a population can receive a minimally adequate level of physician care if it is served by equal numbers of specialists and general practitioners and that these are available in a combined ratio of at least 141 physicians per 100,000 people.

On this basis, the needed number of general practitioners can be found by halving the overall physician requirement, that is 70.5 general practitioners and 70.5 specialists per 100,000 people. Table 74 shows the actual and needed general practitioner-to-population ratios for the six counties, but this time osteopaths are included (all the osteopaths operating in the six counties are general practitioners). These calculations show that whereas there were 26 general practitioners in the rural counties in 1967, 31 were required to provide a minimally adequate level of physician services. This means that there was a deficiency of five physicians. Antrim had two more, and the other counties seven less, than the minimum. Presumably the costs of meeting specified needs could be lessened if the two extra physicians were to practice in the deficient counties.

Dentists

The importance of dentists in fulfilling people's health needs is often underestimated. In many respects this is the result of an attitudinal lag with respect to conceptions about the need for dental service. People generally view dental services less urgently than they do physician services. They take the position that the former are not only more easily postponable but postponable at a lower personal cost. That such attitudes may prove costly in the long run is implicit in the emphasis modern denistry gives to the prevention and control of disease.[8]

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[8]This is probably nowhere more strongly brought out than in television advertising in which toothpaste manufacturers, often with the apparent blessing of the American Dental Association, extol the virtues of fluoridation, dental health education, and early detection and correction

TABLE 74.--Actual and needed general practitioners (M.D.'s and D.O's) in the isolated counties of the Grand Traverse Region, 1967

County	Population	Number of G.Ps.	Number of G.Ps. per 100,000 people	Minimum number of G.Ps. needed[a]	Minimum number of G.Ps. needed per 100,000 people
Antrim. . . .	9,000	9	100.0	7	70.5
Benzie. . . .	7,900	5	63.2	6	"
Crawford. . .	5,400	3	55.5	4	"
Kalkaska. . .	4,600	3	65.2	3	"
Leelanau. . .	9,600	4	41.6	7	"
Missaukee . .	6,300	2	31.7	4	"
Area. . .	42,800	26	60.7	31	70.5

[a]Note: Missaukee's excepted, calculations were rounded to the nearest whole number.

As might be expected, the attitudinal lag is more evident in rural areas than in urban areas and is particularly telling in rural farm areas. This is suggested by surveys which found that the average number of dental visits per person per year was 1.8 for urban residents, 1.3 for rural nonfarm residents, and 0.8 for rural farm residents.[9]

The number of dentists required to fulfill a population's basic needs is generally taken to be equal to the national average number of dentists per 100,000 people in the year of concern. This rather inexact approach is based on somewhat similar criteria for setting minimum physician needs. For dentists the objective is to produce at least enough dentists each year to maintain until 1975 the 1963 ratio of 55.7 dentists per 100,000 population.[10] Since the 1967 ratio was actually 56.3 per 100,000, it will be used as the guideline against which to judge whether the region's dental needs were fulfilled in terms of available services.

Table 75 shows the number of dentists and the number needed according to the guideline. The totals indicate that three additional dentists were needed to provide a minimum adequate level of dental care. Grand Traverse and Benzie Counties had excess dentists, but the other counties were deficient.

Nurses

Nursing is the largest component of medical manpower. Also, because nurses provide a diverse array of health services in a range of different

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[9]U.S. Department of Health, Education, and Welfare, Health Statistics, United States, July 1957-June 1959, U.S. Public Health Service, Series C, No. 5 (Washington: U.S. Government Printing Office, 1961), p. 25.

[10]Ibid., p. 273. Also: Health Manpower, Report of the Task Force on Health Manpower (Washington: Public Affairs Press, 1967), p. 56.

TABLE 75.--Actual and needed dentists in the Grand Traverse Region, 1967

County	Actual		Minimum needed	
	Number	Per 100,000 population	Number	Per 100,000 population
Isolated rural counties:				
Antrim.	3	33.3	5	56.0
Benzie.	7	88.6	4	56.0
Crawford.	2	54.0	3	56.0
Kalkaska.	2	43.4	2	56.0
Leelanau.	4	41.6	5	56.0
Missaukee	1	15.8	2	56.0
Isolated semi-rural counties:				
Grand Traverse.	27	73.0	21	56.0
Wexford	5	28.2	10	56.0
Region.	51	52.3	54	56.0

employment settings, it is a very complex field. While hospitals and other facilities will continue to be the major source of demand for nurses, demand for nurses in other roles is likely to increase. This is particularly likely to happen in rural areas where, because of the shortage of physicians and facilities, nurses may be diverted from the nursing role (care) to the medical role (cure) and be required to provide health services outside of medical facilities.

Additional nurses will be needed to fill these roles. But, as with other health professionals, there are insufficient nurses to meet present demands. The Surgeon General's Consultant Group on Nursing has estimated that 350 nurses per 100,000 people are required to meet the nation's health needs. It was indicated earlier that this estimate exceeded Michigan needs which were put at 327 per 100,000 people.[11] The Consultant Group's estimate included nurses in the armed services and is, therefore, high in terms of rural needs. Assuming that the Michigan estimate is more descriptive of the region's needs, there should have been 319 (97,500 x .327) nurses to provide adequate services for the regional population. This is only three more than the actual number of nurses. But, whereas general practitioners and dentists may be available mostly for local needs, nurses, through their hospital affiliation, are necessarily employed in the production of medical exports. So the actual number of nurses needed was undoubtedly greater than 319. Taking once again the regional plus nonregional population of 110,400 as the target, it may safely be estimated that at least 361 (110,400 x .327) nurses were needed in 1967. This is 45 more than the actual number, and will be assumed sufficient to have provided adequate hospital and public health nursing services.

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[11] See p. 60.

Meeting the Needs

The previous sections have shown that despite the overall high quality and quantity of medical services available in the Grand Traverse Region, personnel shortages did exist. Such shortages can be particularly telling in rural areas because the people, by reason of locational, economic, and cultural factors, generally receive less adequate levels of health care than their urban counterparts. This is especially noticeable when the health services are highly centralized, as in Traverse City.

The lack of services in outlying areas has two effects. First, it means that some of the people will not be receiving a minimum standard of adequate health care and, second, it means that when the same people do seek care, they may have allowed their health to deteriorate to the point where they need more skilled attention than their local practitioners can provide. Hence, they find themselves hospitalized or required to visit specialists. The latter effects can place undue strains on the ability of central facilities to operate effectively. The services needed in outlying areas, to prevent the sort of situation described above from occurring and to assure that the people have an amenable source of adequate health care, are personal services of general practitioners, dentists, and community nurses. What has been suggested above is that the addition of five general practitioners, three dentists, and 45 nurses could have met these needs in 1967.

Financial Requirements

Two questions must be answered in this section. First, what would it have cost to provide these additional services? Second, from what source could the finances have been generated? These questions are straight forward. To answer them in a similar vein requires some assumptions.

Assume, first of all, that these services had been provided and that their addition did not change the output of other producers; that is, demands on the added personnel were generated by people with unmet health needs. Also assume that the costs of adding these services were paid from public funds, though the revenue source had not been determined.

Now, in order to persuade these health professionals to practice in the deficient areas they would, unless charitably inclined, have to be paid salaries equivalent to those of similar professionals in the region. Thus, gross reimbursements would have been $52,216 for a general practitioner, $49,257 for a dentist, and $5,000 for a nurse. The total bill obtained by multiplying these figures by the respective number of needed professionals, would have been $633,851. Dentists' and doctors' incomes include all expenditures. However, assuming the additional nurses are employed in the public health service, there would have been complementary expenditures of approximately $710 per nurse ($31,950 in total) by the service.[12] Adding this to personnel expenditures ($31,950 + $633,851) gives $665,801 as the minimal amount of additional expenditures needed in 1967.

Given the cost of providing the extra health professionals, the next step is to examine alternative financial sources. The presumption was made that, for the most part, these additional services were needed for remotely located populations. Since the economic status of most of the region's counties is depressed and since the people most in need of more medical attention are relatively poor, it is unlikely that they could be persuaded to divert more personal expenditures into health care. Philanthropic sources, another possibility, are already well extended in the

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[12]It was estimated in chapter VII that 70 percent of public health expenditures were for salaries and 30 percent represented other expenses.

region. But the role of philanthropy has been declining on a national basis, so it is probably unrealistic to expect much from this source. This leaves government as the only feasible source of sufficient funds. However, for government to underwrite the cost of additional medical expenditures, taxes must be raised.[13] Average per capita disposable income in the region was $2,009 in 1967, well below the U.S. and Michigan average (see p. 37). But, taxes would have to be raised by approximately $6 per person or $34 per household.[14]

This is more than the counties could be expected to raise in additional taxes. For the federal or state government to undertake the task there would, normally, have to be a general increase in taxes or a shift in existing expenditures. Because of the region's relatively low income status, it would probably be the recipient of a net inflow of funds were either of these adopted. Since the funds would be channeled through the medical industry they would raise its export income and increase its importance in the regional economy.

It may, however, be unrealistic to assume that governments will automatically be able to finance more health services than they do. Current programs, such as Medicare and Medicaid, are under constant adverse criticism, mainly on the grounds of their great cost and great pecuniary benefit to the incomes of the medical industry.[15] It is unlikely therefore that the Congress or state legislatures will readily approve large additional health relief programs until some of the problems with the present programs are solved.

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[13]That is assuming no change in government spending priorities and avoidance of deficit financing.

[14]Average disposable income per household was $6,858.

[15]U.S. Congressional Record, 91st Cong. 2nd Sess., 1970, Vol. 116, No. 17, pp. H694-H697.

Several chapters have been devoted to this question of the high cost of medical care. Estimates were derived of the potential saving to the region that would result from the elimination of excessive incomes and inefficiencies. In particular, medical doctors and drug manufacturers were found to be earning excessive incomes; no evidence of excessive earnings was found for the medical equipment industry; and no really significant evidence of hospital inefficiencies were found. Estimates of excess costs attributable to these activities are shown in Table 76.

Suppose now that, instead of taxing the population to support needed medical services, it were possible for the government to have imposed lump sum taxes on doctors and drug manufacturers equal to their excess earnings.[16] In this case there would be some amount between approximately $225,000 and $710,000 available for financing additional medical services in the region. The estimated cost of needed services was approximately $660,000. These findings point to an obvious conclusion. At a minimum, excess expenditures were sufficient to finance more than a third of the needed services, while at a maximum they were more than sufficient. All this could have been achieved at no direct cost to the people served, provided the additional services could have been obtained. Even the lower bound estimate would be sufficient to pay for the five additional general practitioners and the three nurses needed for the purely regional population.[17] But the upper bound estimate provides enough funds to have assured the availability of at least minimally adequate services for all the people using the region.

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[16]The basic assumption behind a lump sum tax is that because it has no effect on a firm's marginal cost curve, its imposition will not affect the profit maximizing level of output.

[17]Five additional doctors, assuming they were paid at the competitive rate, would earn in total excess incomes of between $5,236 and $24,131. This, too, would be available for further health assistance.

TABLE 76.--Excess expenditures in the Grand Traverse Region's medical industry, 1967

Medical service	Excess earnings	
	High estimate	Low estimate
	Dollars	
Medical doctors	617,743	134,030
Drug industry	91,572	91,572
Total	709,315	225,582

Conclusion

The rather distinct and provocative finding that there were sufficient excess expenditures to finance enough additional services to assure an adequate supply of medical services in the region must be treated cautiously.

In the first place it does not, nor is it intended to, prescribe a policy for overcoming the problem of unmet health needs in rural areas. It draws on findings of excessive medical expenditures transformed into inexplicably high incomes of medical doctors and drug manufacturers. It takes a simple measure of unmet health needs, seen strictly from the supply or need for more services side, and shows the cost of meeting them. And, in the quest for a means to finance the additional services, it indicates a need for government involvement. Should government undertake the task of financing the extra services, taxes would have to be increased or priorities altered. It is unrealistic to assume, however, that additional health funds will be appropriated in the absence of radical changes in the health delivery system. Impelled by criticism of profiteering by doctors and drug suppliers, by inefficiencies in hospitals, and by abuse of programs for the elderly and the poor, the federal government is primarily concerned with finding ways of reducing or allaying increases in the cost of medical care.

Under current welfare programs the gap between the price received by the medical industry and the price paid by the consumer is wide and represents the subsidy paid by government. To reduce the gap the supply of medical services must be increased. If this happens, continued subsidies may be needed to assure adequate increases in output, but the result, in the absence of completely offsetting increases in demand, would be lower unit costs. This study does not show how this can be achieved.

It does show that there are excess funds actually generated in the industry itself which, if accessible, could be directed towards the provision of more services.

The fact that the financial estimates of excess incomes and unmet needs are so close is, of course, coincidental. The fine balance stimulates the quest for imaginative theoretical inference. Joan Robinson's discussion of using equal subsidies and lump sum taxes to force monopolists into producing a competitive level of output seems obvious.[18] Yet, as Mrs. Robinson points out, there is little hope for practical application of such schemes; which, among other things require unchanging and well-known demand and supply curves.

But there is another, more fundamental, point. These conclusions are only drawn with respect to one region. Sarkar, in his study of Michigan' upper peninsula, found that excess incomes would provide only 44 to 48 percent of the amount needed to finance unmet needs.[19] In other areas the amount might be greater. But it is difficult to conceive of many rural areas like the Grand Traverse Region, where there would be sufficient excess funds in the medical industry to cover the cost of its own deficiencies.

The Grand Traverse Region is unusual, medically. Although medical facilities and personnel are located in all eight counties, it is Traverse City, with its comprehensive structure of medical facilities and attendant highly specialized medical manpower pool, that has developed into an acknowledged medical center. This complete system provides medical services for most of the region's population as well as for a large number of nonregional residents. As a result, it generates spending both from

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[18]Joan Robinson, The Economics of Imperfect Competition (London: Macmillan and Co., Ltd. 1933; reprinted 1954), pp. 163-165.

[19]Sarkar, pp. 118.

regional and nonregional sources. The sum and distribution of these expenditures is sufficient to place the industry among the region's leading economic sectors.

This study has shown the importance of a large medical sector not just from the perspective of its potential economic impact but, fundamentally, from the perspective of the inescapable conclusion that the potential for eliminating waste and unmet needs increases with the size of a region's medical industry, but since the reverse is also likely to be true, few rural areas possess the internal possibilities of the Grand Traverse Region.

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