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Introduction and Summary

Introduction

Expenditures for physicians' services in the United States increased by 328 per cent between 1948 and 1969—a growth rate considerably more rapid than that of gross national product or personal consumption expenditures, and about the same as that of other services.¹ This paper examines the rise in expenditures for physicians' services and attempts to explain the pattern of change in the decades following World War II. We also analyze the very large geographical differences in expenditures per capita that exist in the United States. Our study should contribute to an understanding of the economics of medical care and to an improvement in the nation's ability to predict and control such expenditures in the future.

Concern over the cost of medical care is widespread. Special attention has been focused on the rapid rise in the price of and the expenditures for physicians' services because it is said that these services are essential, that the price is not determined in a competitive market, and that consumer ignorance gives the physician unusual control over the quantity and type of service provided. Furthermore, the extensive growth of third-party payment, through both private insurance and governmental programs, is believed to exacerbate inflationary pressures in this area by reducing the net price to the consumer and thus encouraging utilization.

The essentiality argument is a complex one and rests as much on subjective beliefs as on objective evidence. Basically, a service can be considered essential on two grounds. The first applies where the demand for the service is relatively insensitive to changes in income—where it is regarded as so necessary that (in the absence of philanthropy, sliding fee scales, or third-party payment) families with low incomes devote a relatively large portion of their budget to it. Some elements of physicians' services are clearly necessities in this sense, e.g., surgery for an inflamed appendix. Many physicians' services, however, ranging from well-baby care through annual checkups to elective surgery, are not so clearly necessities, while still others (like cosmetic surgery) might well be classed as luxuries.

A second criterion of essentiality applies to a service the consumption of which involves important external effects. Thus, basic education for all is considered essential in the United States partly because of the belief that the failure to educate some will have serious unfavorable repercussions on others. A similar argument concerning physicians' services could be advanced with respect to treatment of communicable diseases. At one time such diseases occupied the bulk of physicians' time, but currently they are much less important.

Probably more important than the essentiality argument is the peculiar nature of the market for physicians' services. When a good or service (without significant external effects in either production or consumption) is produced and sold under reasonably competitive conditions, there is usually no special need for public attention or public policy. In such cases, changes in price and expenditures presumably reflect the true cost to society of producing the good or service and the knowledgeable judgment of consumers regarding its value. With respect to physicians' services, the imperfections of competition are numerous and powerful. On the supply side, these include the restrictions on entry created by licensure and professional control of medical education, the limitations on practice implicit in the hospital appointment system, and the absence of price cutting, advertising, and other forms of rivalry. As for demand, the difficulty consumers experience in judging the quality of physicians' services is well known, and it is thought by some that the physician plays a major role in determining the quantity of services to be provided [6, for example].

The concern over cost among consumers has been reinforced in recent years by that of third-party payers, particularly the government. Open-ended commitments to finance services have been followed by very large increases in price and expenditures; these increases have stimulated efforts to uncover their causes and to develop techniques for moderating them in the future.

This study, which is part of that effort, is composed of two principal parts. The first provides a statistical decomposition of the growth of per capita expenditures at the national level. Major attention is focused on the sharp differences in the rate of change of this variable between the subperiods 1948-56 (4.1 per cent per

¹The comparable 1948-69 growth was 260 per cent for gross national product, 230 per cent for personal consumption expenditures, and 330 per cent for all services (except housing).

annum) and 1956-66 (6.6 per cent per annum). Possible reasons for this difference are explored through an examination of changes in price, insurance coverage, income, population, number and type of physicians, and medical technology. Problems of definition and measurement are discussed and some tentative inferences are drawn.

The second part is concerned with the development and testing of a formal model to analyze the behavior of physicians and patients. Cross-sectional (state) data for 1966 are used to gain an understanding of variations in quantity of services per capita, physicians per capita, quantity of services per physician, and insurance coverage. The consequences for health of differences in the quantity of physicians' services are also explored.

The principal limitations of the study are attributable to the paucity of available data. In our analyses we are frequently forced to exclude certain variables that seem appropriate on a priori grounds, or to include series that are only partially indicative of the variables actually desired. For instance, nearly all of the analysis is limited to physicians in private practice. Data on expenditures for services rendered by salaried members of hospital staffs are not available. Even for private physicians the breakdown of expenditures into price and quantity components is based on indirect estimates rather than precise direct measures. Finally, it should be noted that this paper is not intended to review systematically the literature on physicians' services, although we do consider the views of other observers in the formulation of hypotheses.²

Summary of Findings

The most striking finding of this study is that supply factors (technology and number of physicians) appear to be of decisive importance in determining the utilization of and expenditures for physicians' services. This conclusion stands in sharp contrast to the widely held belief that utilization and expenditures are determined by the patient, and that information about income, insurance coverage, and price is sufficient to explain and predict changes in demand.

²For comparisons of our formulations and conclusions with those of other investigators, see our bibliography [4], [7], [15], [16], [17], [28], [37], [41].

The data we present in Part 1 show that the shift in the growth rate of physicians' services³ per capita from -0.4 per cent per annum in 1948-56 to 3.0 per cent per annum in 1956-66 is more closely related to the changing nature of medical technology and to shifts in the number of physicians than to conventional demand variables. It seems to us that estimates of future "needs" for physicians are likely to be unreliable unless one can predict the nature and extent of future changes in medical science. That there will be such changes is certain; whether they will be of a type that economizes on the use of physicians' services (such as the antibiotic drugs) or whether they will increase the requirements for physicians (such as organ transplants) is of crucial importance. Furthermore, the "need" for physicians' services should not be treated as synonymous with the "need" for physicians; the record shows that the quantity of service per physician has been rising over time, and at a variable rate.

When we turn to an examination of variations in demand, holding technology constant (in the cross-sectional analysis of Part 2), we find additional support for the view that the number of physicians has a significant influence on utilization, quite apart from the effect of numbers on demand via lower fees. Indeed, we find that the elasticities of demand with respect to income, price, and insurance are all small relative to the direct effect of the number of physicians on demand. Of course, the emphasis we give to supply does not deny an independent role for demand entirely, especially when the patient is faced with major changes in the net price of care, such as those created by the introduction of Medicare and Medicaid.

Because physicians can and do determine the demand for their own services to a considerable extent, we should be wary of plans which assume that the cost of medical care would be reduced by increasing the supply of physicians. Our analysis suggests that such increases would at best have limited impact on price, though they would result in substantial increases in utilization. In estimating the social value of increased utilization,

³"Quantity" is measured by deflating expenditures by an estimate of the average price actually received by physicians. It is not equivalent to number of visits because it also reflects shifts in the type of physician visited (specialist or G.P.) as well as in the quantity of tests, x-rays, and other services provided in the course of the average visit.

however, note should be taken of our finding (in section 2.6) that variations across states in the quantity of physicians' services appear to have little or no effect on either infant mortality or the overall death rate. Of course, an increase in physician supply has other effects that should be considered. The subjective utility derived from the consumption of physicians' services is likely to rise as physicians devote more time and personalized attention to each complaint, and the indirect costs incurred by patients will fall as general access to physicians improves. The subjective qualitative aspects of physicians' services are not considered in this paper.

Given the importance of supply, it is of interest to ask what factors determine it. The cross-sectional analysis throws some light on physicians' locational decisions. They seem to be attracted by higher prices for their services, by medical schools and hospital beds, and by the level of educational, cultural, and recreational opportunities indicated by the average income of the population. We did not find any evidence for the theory that encouraging more state residents to enter medical schools pays off in terms of more physicians returning to practice in their state of origin. Also, physicians do not show any special preference for states with low health levels. This absence of what some might regard as "professional responsibility" in choice of location stands in contrast to the behavior of physicians already established in a given location. We find that physicians practicing in states where the physician-population ratio is low *do* provide more services apart from any price considerations. Indeed, given location, there is no evidence to show that higher prices induce additional services from physicians; there is some reason to believe that they may have the opposite effect.

One finding in which we have considerable confidence deserves special mention because it reveals the unusual nature of the market for physicians' services. We refer to the fact that states with high quantity of service per capita (Q^*) have relatively low quantity of service per physician (Q/MD). The coefficient of correlation in 1966 was -0.5 . The quantity series is admittedly

imperfect, but errors of measurement in that variable would tend to produce a positive correlation between Q^* and Q/MD . There is good reason to believe, therefore, that the true correlation is even more negative than -0.5 . Such a relationship is very surprising under either one of the following two interpretations of the Q/MD variable. If it is regarded as a measure of the average size of the "firm,"⁴ we would expect a positive correlation with quantity per capita. If we regard it as a partial productivity measure, we would also expect a positive correlation with quantity per capita. These expectations are based on experience with many other industries [39, for example]. The negative relationship observed in this industry may be attributed to the behavior of physicians. Where these are relatively numerous they both increase the demand for their collective services and cut back on the amount of service each one individually provides. Where physicians are scarce the reverse occurs. The result is a strong negative correlation between Q^* and Q/MD .

Having set forth what we believe to be reasonable inferences from the data we have examined, we hasten to remind the reader of the caveats mentioned throughout the paper. The statistical experiments performed in Part 2 cannot be regarded as definitive; obvious weaknesses in the data and possible shortcomings in the specification of the model suggest that the empirical findings should be regarded as highly tentative. Given the data limitations, the chief contributions of Part 2 are the development of a comprehensive model of the market for physicians' services and the development of a technique for estimating quantity and price by state.

Additional research is clearly essential in order to predict accurately the consequences of proposed changes in the financing and organization of medical care, and the availability of relevant, reliable data will be of critical importance to the success of that research. Considering the magnitude of health care expenditures (over \$70 billion per annum), strenuous efforts to make such data available would seem justified.

⁴This would be the case if all physicians had solo practices.

