PRICE AND INCOME ELASTICITIES FOR MEDICAL CARE SERVICES

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JOSEPH P. NEWHOUSE
CHARLES E. PHELPS

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PREFACE

This report was prepared under a grant from the National Center for Health Services Research and Development entitled Demand for Medical Care Services. One of the principal objectives of the grant is to estimate the price and income elasticities for medical care services. This report presents preliminary estimates of these elasticities based on data collected in a survey of 1963 experience conducted by the Center for Health Administration Studies at the University of Chicago. Because an attempt was made to verify the terms of the insurance policies held by the families in this sample, and because all inpatient utilization was verified, these data are considered to be the most reliable existing survey data on this subject. The Center for Health Administration Studies made another survey in 1971 of 1970 experience, which should be available soon for comparison with the 1963 survey. In addition, the Health Insurance Study, which is being conducted by Rand, will provide still more reliable data on this subject. The subject is important for policy purposes because an estimate of the price elasticity of demand is necessary to assess the effects on the demand for medical services of pending legislation pertaining to medical care financing.

There are still many hypotheses left to be explored in the data (some of which are noted in the text). In addition, the authors wish to test the robustness of the results against alternative assumptions. The report is being issued at this time because it contains information that will be useful in the policy debate over health financing legislation.

A preliminary version of this report was given at a conference of the International Economics Association in Tokyo, April 1973.

SUMMARY

This report is intended to make both a theoretical and empirical contribution to the estimation of price and income elasticities for medical care services. The theoretical contribution is a generalization of Michael Grossman's theory of demand for medical services. The significant generalizations include: (1) disaggregation to particular medical services (in this report these include hospital length of stay, choice of hospital, physician visits, and choice of physician); (2) treating individual insurance as endogenous as indicated by Charles Phelps' theory of the demand for insurance; and (3) treating price of provider selected as endogenous. We also consider what causes differences in price among providers and therefore whether data in expenditures or physical units are more appropriate to analyze. We actually analyze neither expenditures nor physical units in their pure form, but rather physical units times the average expenditure across the sample for the type of provider used (for example, specialist, general practitioner), on the maintained assumption that differences in average price among types of providers reflect differences in productivity, but differences within type of provider do not. We also analyze differences between the actual price of the provider selected and the average price for a provider of this type.

Our results have been estimated by both two stage least squares and ordinary least squares for heads of families who are participating in the labor force. In general, the two stage results are near zero and not significant; the elasticities estimates using OLS are also fairly small but are generally significant. Own-price elasticities at the means are estimated to be on the order of -0.3 for hospital length of stay and -0.1 for physician office visits. Hardly any individual is insured for physician services in this sample, and therefore the figure for physician visits cannot be considered a very reliable estimate of demand at low coinsurance rates. Cross-price elasticities are estimated to be on the order of -0.1 using OLS for hospital length of stay and physician office visits. In these primary

results we have not imposed the restriction that the cross-partial elasticity of substitution terms be equal. Elasticities with respect to wage income are around -0.15 to -0.35 for hospital days (at the mean of price) and 0.1 for physician visits, but are not significantly different from zero. The effect of non-wage income on utilization is not significantly different from zero, as predicted by the theory.

In these data the physician office visit coinsurance rate plays a significant role in determining the price of the provider selected, though the hospital room and board coinsurance rate does not. The elasticity of price with respect to the coinsurance rate is around -0.25. The elasticity of physician price with respect to wage income is around 0.1; the elasticity with respect to non-wage income is insignificantly different from zero, suggesting that higher prices are due to less search by individuals with high prices for time or a higher price is paid for less queueing. The insignificance of the non-wage income variables suggests that amenities are not important. Those who use services more intensively appear to search for less expensive providers.

We have also introduced variables to measure the supply of physicians and hospital beds in an area to test the possibility that there may be non-price rationing of services when supply decreases. We found some moderate support for this hypothesis. An increase in the number of beds in an area, other things equal, tends to increase length of stay; and an increase in the number of physicians tends to increase physician visits. Because we used individual data, we assumed these supply variables to be exogenous; if this maintained hypothesis is correct, the identification problem facing studies using regional data is avoided.

The elasticities found for heads of families in the labor force are generally supported when the sample is expanded to include individuals who are not in the labor force. Elasticities using both OLS and TSLS are on the order of -0.1 and are significant using OLS but not TSLS. These results will be described in a forthcoming report.

ACKNOWLEDGMENTS

We would particularly like to thank Ronald Andersen of the Center for Health Administration Studies at the University of Chicago. Without him this report would truly have never come into being, since he graciously made the data from the 1963 Center for Health Administration Studies' survey available to us. David Weinschrott provided us with most of our computational assistance and spent a great deal of effort to ensure the accuracy of our insurance policy parameters. Mark Thompson gave us assistance in a preliminary draft, which used data from families. Richard Rosett pointed out an important error in a preliminary version; he and Stephen Carroll both deserve thanks for helpful reviews of an earlier draft. We would also like to thank Michael Grossman and Bridger Mitchell for general advice and counsel, but we assume responsibility for any remaining errors.

CONTENTS

I. THEORY

In this report we estimate price and income elasticities for medical care services. Our effort is guided by an underlying theory that is a generalization of Michael Grossman's work (1972). Grossman postulates two models. In the first, which he calls the investment model, medical services are of benefit to the consumer because they increase the amount of productive time he has available. In the second, which he calls the consumption model, the stock of health enters the utility function directly. Grossman prefers the investment model to the consumption model for a number of reasons: (1) The investment model generates a strong prediction on the effect of non-work-related income, specifically that it have no effect; (2) there is an unambiguous positive sign on the effect of wage income in the investment model (in the consumption model, if medical care is sufficiently time intensive, the sign of wage income may be negative); (3) the investment model leads to a simpler prediction on the effect of education.[1] Grossman finds empirical support for the investment model, most notably that non-wage income does not appear to be related to the stock of health.

We generalize Grossman's investment model in three significant ways: (1) We drop the assumption that medical care goods are a homogeneous commodity. Consequently, we introduce specific medical services, such as hospital days, for which we estimate demand equations. The most important reason for this is obvious--medical care services have neither fixed relative prices nor are they consumed in fixed proportions. Hence, they do not satisfy the conditions required to treat them as a composite commodity. Separate demand equations are also helpful in understanding where pressure on the medical care system is likely to develop if there is an exogenous reduction in the price of

[1] The investment model also predicts a difference between the effect of a change in wage and a change in the amount of time necessary to consume medical services on the consumption of those services. In the consumption model, these effects are identical in elasticity form. See Acton (1973).

medical care services, as, for example, might occur if a public health insurance program were enacted or modified. (2) We explicitly introduce health insurance into the analysis, so that the prices facing the consumer are net of insurance. We allow for the possibility that individual insurance is endogenous; that is, affected by *expected* medical care consumption. In doing so, we make use of Phelps' (1973) theory of demand for insurance. To treat insurance as exogenous could result in overestimating the price elasticity.[1] (3) We explicitly take account of "style" phenomena--for example, differences in amenities among various providers.

To briefly recapitulate Grossman's investment model, it is assumed that consumers maximize a well-behaved intertemporal utility function, U, which is a function of a composite commodity, Z.

$$U(Z_1, Z_2, \ldots, Z_n) \tag{1}$$

The subscript dates the time period.[2] This function is maximized subject to the constraints that all income be spent on consumption of Z and that all time be allocated to market work (which pays a wage, w), consumption of medical care services, consumption of other goods used to produce Z, or sick time. Medical care services augment an individual's health stock, which reduces the amount of sick time. Given a specified difference between initial assets and terminal wealth, these two constraints can be collapsed into a full wealth constraint given by (2):

$$S = \sum_{t=1}^{n} \frac{w_t h_t - \Pi_t I_t}{(1 + r)^t} + A . \tag{2}$$

[1]This is always true if premiums are divorced from *individual* expected health status (and set on the basis of population characteristics). The same result holds on insurance priced by an individual's characteristics under many circumstances. See Phelps (1973).

[2]See Grossman (1972), Appendix A, for a generalization to continuous time.

In this formula, S is full wealth, w_t is the marginal valuation of time in period t, h_t is the healthy time available in period t, Π_t is the shadow price of investment in the health stock H in period t, I_t is the gross investment in the health stock in period t, r is the discount rate, and A is the present value of non-wage income plus any planned accumulation of assets. We assume along with Grossman that H is subject to a depreciation rate, δ, which increases with age after some point, that gross investment in the health stock is always positive, and that investment in health services and production of Z can take place using market goods, own time, and environmental variables according to the production functions described in (3) and (4).

$$I_t = I(M_t, TM_t; E_t) \tag{3}$$

$$Z_t = Z(X_t, TZ_t; E_t) \tag{4}$$

These functions are assumed to be linear and homogeneous in the goods and time inputs. The variables not previously defined are M_t, a vector of the amount of purchase of each medical service in the tth time period; TM_t, a vector showing the time spent in each medical service in the tth time period; and E_t, the value of any environmental variable in the tth time period. X_t is a vector of goods used to produce Z_t, and TZ_t is the analogous time vector. For simplicity we assume that M does not enter the production function for Z and that X does not enter the production function for I.[1] We also assume that health services do not affect the wage.[2]

Because the return on investment in health stock accrues solely as an increase in production time (decrease in sick time) in this model, the return can be measured as $w_t G_t$, where G_t is $-\partial T_t/\partial H_t$, where T_t is sick time in the tth time period.[3] Thus, G_t is the marginal product

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[1] For a discussion of the case in which X enters the production function for I, see Grossman (1972).

[2] Implicitly, w equals zero during sick time.

[3] Some may wonder why the return does not accrue over all future periods. The complete derivation can be found in Grossman (1972), but

of an increment to the stock of health in terms of less time lost to sickness. Let PM_{jt} be the price of the jth service in time t. Then

$$C_t = \sum_j M_{jt}PM_{jt} + TM_{jt}w_{jt}$$

are the resources spent on health care in time t, where j indexes the jth medical service. Then Π_t, the shadow price of additional investment in the stock of health, equals dC_t/dI_t. As a result, the marginal efficiency of health capital schedule is given by w_tG_t/Π_t. Let η equal the elasticity of this marginal efficiency of capital schedule with respect to Π_t.

Then it can be shown that η_{ip_j}, the price elasticity of the ith medical service with respect to the jth service's price, equals:

$$\eta_{ip_j} = k_j(\sigma_{ij} - \eta) , \qquad (5)$$

where k_j is the budget share of the jth service in gross investment (p_jM_j/I), and σ_{ij} is the Allen partial elasticity of substitution (Allen, 1938, pp. 502-509). If i and j are substitutes, σ_{ij} is positive; if they are complements, it is negative, and it is always negative if i = j. Because of decreasing marginal productivity of the health stock, η is positive.[1] The effects of a change in TM or M due to technological change in medical care are analogous to changes in price.

The effect of a change in the wage rate (or price of time) is somewhat more complicated. Grossman derives the result for the two factor case that:

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the heuristic explanation is that the consumer rents a unit of health capital for one period that is paid for by reducing gross investment in future periods.

[1]

$$\eta = -\frac{\partial \ln H_t}{\partial \ln G_t} ,$$

where H_t is the value of health stock in time t.

$$\eta_{iw} = (1 - K)\eta + K\sigma \ , \qquad (6)$$

where σ is the elasticity of substitution between goods and time in the two factor gross investment production function and K is the budget share of time in gross investment.

This result can be generalized to the many factor case by using the result from Allen stated in (5). A change in the wage rate changes a subset of factor prices and also what (in Allen's notation) is the product price, since the physical product in this instance corresponds to G and the product price to w. A change in the product price in a perfectly competitive market with linear and homogeneous production functions changes the demand for each factor by η, the price elasticity of demand for the product. This is the source of the η term in (6). Because each time input has the wage rate as a price, and because the wage rate changes equally for each price, we can simply sum the right hand side of (5) over all time inputs and add the η term from the change in the product price to reach:

$$\eta_{iw} = \left(\sum_j K_j \sigma_{M_i TM_j}\right) + \left(1 - \sum_j K_j\right)\eta \qquad (7)$$

where K_j is the budget share of the jth time input in gross investment and $\sigma_{M_i TM_j}$ are Allen partial elasticities of substitution between the ith good and the jth time input. (This obviously reduces to (6) in the two good case.)

A number of implications can be drawn from this framework. First, since σ_{ii} is always negative and η is positive, own-price elasticity is always negative. Second, cross partial elasticities of substitutions are equal, $\sigma_{ij} = \sigma_{ji}$. This restriction, imposed by the theory, has not been taken account of in the empirical work presented in this report. Third, the sum of σ_{ij}, weighted by budget shares, must sum to zero. Since we do not know TM_i, we cannot compute all budget shares and hence cannot take account of this restriction. The result is that η is underidentified. There is also the restriction that η is identical across services and greater than zero; this latter restriction is

accounted for only indirectly, in requiring that the own-price elasticity be negative.

For policy purposes we are interested in any possible interactions between price elasticity and income. One should distinguish between wage and non-wage income. The investment model predicts that utilization will have a zero elasticity with respect to non-wage income and hence prior elasticity should not interact with it. The consumption model yields no prediction.[1] The situation is more complicated with respect to wage income. As wage income rises, we would expect k_j to fall,[2] which would imply that price elasticities would fall if σ and η were constant. We cannot rule out changes in σ and η *a priori*, however, so we cannot sign the interaction term. Other price elasticity interactions are of interest, especially the interaction with health status or size of loss. This would show whether "quite sick" individuals responded to price differently from individuals who were not "seriously ill." We do not explore this interaction in this report. We have also not explored how price elasticity changes through the range of price. These hypotheses are examined in Newhouse and Phelps (1974a).

Another generalization of Grossman's model is the introduction of insurance parameters. We have reduced each insurance policy to three parameters: a deductible, a coinsurance rate, and a limit. The deductible and the limit define expenditures, below and above which the marginal price to the consumer equals the gross price--between those expenditures the marginal price equals the coinsurance rate times the gross price. In this situation in which the marginal price is a

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[1] In the consumption model, the sign of the interaction is determined in part by the magnitude of the third partial derivatives of the utility function and is thus unsigned.

[2] It can be shown that the sign of

$$dk_j/dw \stackrel{\sim}{=} (\eta_{jw} - 1)wT_H + \eta_{jw}A \ ,$$

where T_H is health time. The approximation is because we assume $dT_H/dW = 0$. For estimated values of η_{jw} and usual values of wT_H and A, this will be negative.

function of total expenditure, the entire price schedule and the time remaining in the accounting period are both relevant to define the appropriate price (Keeler, Newhouse, and Phelps, 1974). We have therefore excluded from our empirical work those with deductibles in their policies. Fortunately, this is not a large number of individuals. This leaves us with a set of individuals who face a constant marginal price up to an upper limit. We have assumed that upper limits are sufficiently high that they affect behavior only negligibly, save in the trivial number of instances in which an upper limit was exceeded (in which case we excluded the observation, as explained below). This assumption appears realistic to us; its effect is to bias our estimates of price elasticity very slightly toward zero. Thus, we are left with individuals whose average and marginal price are equal to CP_M, where C is a coinsurance rate.

Inclusion of a number of other explanatory variables follows from Grossman's model. Grossman hypothesizes that the depreciation rate on an individual's health stock increases with age after some point, which leads to more gross investment, if the elasticity of the marginal efficiency of capital schedule (η) is less than one, which he estimates it to be. We permit age to enter non-linearly to allow for a non-linear pattern of depreciation rates by age and expect consumption of medical services to rise with age.

Following Michael (1972), Grossman postulates that education is an environmental variable that enters household production functions. Specifically, the more educated are assumed to be more efficient producers of commodities and of gross investment in health. This will serve to increase their demand for health stock; however, if η is less than one, demand for medical services will fall with education (in the investment model). Grossman does not find empirical support for this proposition, the one instance of a "wrong" sign in his empirical results. Grossman, however, has not controlled for variation in price, which individuals in his sample face. Because we will be working with the same data base as Grossman, but controlling for price, we can attempt to determine whether the positive sign Grossman finds on education is because the more educated have more complete health insurance

in this sample.[1] We therefore enter education and expect to find a negative sign.

The investment model predicts that non-wage income will have no effect on the amount of health stock demanded or medical goods purchased, and Grossman finds that the effect of non-wage income on the demand for health stock is not significantly different from zero.[2] If non-wage income exerts no effect, one of the two possible reasons for including family size as an explanatory variable is eliminated--namely, that the appropriate measure of income for an income effect is a function of family size. The other possible reason for including family size is that health stock and child services are complements in a utility function; Grossman does not find significant family size effects on the purchase of medical services. We therefore do not expect to find a significant effect of family size on individuals' quantity of services consumed.

Grossman shows that under weak assumptions, purchase of medical services rises with health stock loss.[3] Grossman's model does not treat health stock loss as stochastic; to do so, however, can be shown to lead to the same conclusion (Phelps, 1973). This implies that precision would be improved if such loss could be measured. We shall include variables that we expect measure such loss, and we expect them to be positively related to the consumption.

Finally, Grossman does not consider the supply of services in a local market area. Implicitly in his model there is no variation in

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[1]We note that for the same reason Grossman expects to find a negative partial correlation between education and medical care purchases, we might also expect to find a negative partial correlation between education and health insurance. Phelps (1973) finds a positive correlation, but this is no doubt due to his omission of a variable measuring the wage rate.

[2]Note that to the extent health stock loss is random, assets or non-wage income will not be determined simultaneously with health stock and expenditures on medical services. Hence, non-wage income can be treated as exogenous. This is not the case with labor supply. See Smith (1973). Even if an individual planned his asset accumulation and medical care expenditure simultaneously, the operational implication would be to control for age, as we do in any event.

[3]Grossman (1972, Appendix B).

market supply opportunities faced by individuals, either because all individuals are in the same market or all markets are identical. However, markets are local and the degree of capacity utilization does vary across them.[1] Such variation in capacity utilization could lead to certain kinds of non-price rationing. For example, if there are long waits for an appointment with a physician, the self-limiting nature of much illness may serve to reduce demand. Similarly, physicians may use various other types of non-price rationing devices such as varying the revisit rate or the case mix seen if capacity utilization is high. We have included measures of the supply of services as proxies for capacity utilization, because we have no simple measure of capacity utilization available. For this purpose we use the physician/population ratio and the bed/population ratio. We expect the physician/population ratio to be positively related to office visits, and the bed/population ratio to be positively related to hospital length of stay. The "cross-non-price effects" cannot be signed *a priori*. Note that these variables are assumed to be exogenous to the individual; this assumption avoids the identification problem plaguing most studies using area data. Insofar, however, as supply is correlated with demand (positively), using a supply variable to measure capacity utilization will produce an underestimate (biased toward zero) effect of capacity utilization. (In the limiting case each market would be in equilibrium and variation in supply would show no effect.)

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[1]See Newhouse (1974) for some evidence of large variation in capacity utilization of the ambulatory delivery system across major metropolitan areas.

II. STYLE PHENOMENA AND PRICE VARIATION

As anyone who has used the American medical system will have observed, there are numerous independent providers, often charging nominally different prices. This means analysis of variation in expenditure will lead to different results from analysis of physical quantities. Which variable, physical units or expenditure, is appropriate to analyze?

There are at least four aspects of price variation. First, higher prices could simply reflect higher quality--that is, differences in marginal productivity. If so, one should use expenditure rather than physical quantity of services as a dependent variable, since expenditure would measure physical quantities in efficiency units.

Second, higher prices could represent various kinds of product differentiation. For example, they could be a method for reducing queueing. Insofar as this is the case, one would expect to see substitution of higher priced medical services for lower priced medical services by those with a high opportunity cost for time.[1] If the entire difference in prices among providers is attributable to this phenomenon, it implies that one should analyze utilization of services separately from choice of provider. Choice of provider would be determined by the price of time and the price of using that provider (which could vary across individuals because of differences in insurance coverage), but not nonwage income. Utilization of services (in physical units) would be determined by all the factors heretofore analyzed.

Third, some of the price variation could reflect other kinds of product differentiation, such as amenities, better food in a hospital, more tasteful office decoration, and so forth. Such amenities are produced jointly with investment in medical services. Analytically these amenities can be treated as any consumption commodity. The modifications they introduce into our framework are again on price of provider

[1] Queueing refers not only to wait times in the office but also to wait times to an appointment, provided that there is some loss in one's ability to produce home or market goods while waiting for an appointment.

selected, because they imply that both work-related and non-work-related income and possibly family size should affed the price of the provider selected. The distinction between this case of amenities and the case of less queueing time is that non-work-related income is also relevant. If price differentials are solely due to amenity differences, however, we should measure consumption in physical units rather than expenditures.

Finally, some of the price differential may be due to differences in search costs. We would expect individuals with higher values per unit of time to engage in less search and hence use more expensive providers, although this effect is blurred if other members of the family with lower prices of time perform the search function. We would also expect those individuals with more generous insurance to search less, since the return from search is less for them. The effect and conclusions are similar to price variation attributable to varying queue length.

This analysis suggests that we disaggregate utilization of medical services into three components: (1) the pure quantity of services; (2) the usual source of care, measured by an average price index for that source across the entire sample; and (3) the price paid, given the usual source of care.[1] If price differences do not reflect differences in productivity, the first dimension should be measured in physical units. If price differences do reflect differences in productivity, the situation is more complicated. Because variation in price could reflect the other considerations outlined above as well as a change in productivity, the theory developed above does not apply to consumption measured in physical units and applies in only a partial way to consumption measured by expenditures.

We have adopted a middle course. We assume that different sources of physician care (specialists, general practitioners) have different productivities and so multiply visits by the average price of the usual source of care (across the sample) to obtain a utilization variable for the physician equation. Similarly we assume that different types of hospital care (one, two, or three or more medical or surgical

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[1]This disaggregation has been suggested to us by Michael Grossman.

hospitalizations) have different productivities reflected by their average prices across the sample. Hence, the dependent variable in the hospital length-of-stay equation is length of stay multiplied by average price for that type of care.

Price differences among similar usual sources of care are assumed *not* to reflect differences in productivity. This assumption derives by considering the extent of consumer knowledge about productivity; the aspect of productivity the consumer can readily judge is the credential possessed by his usual source of care. Price variation among similar usual sources is assumed to reflect the second, third, or fourth factors. This division of expenditure elasticities is obviously arbitrary; however, the sum of the "utilization" and "price" elasticities will equal the expenditure elasticity.

There remains the problem of specifying an equation to explain price, given the usual source of care. We measure this price deviation by a difference rather than a ratio, because returns from further search are measured in absolute, not relative, terms. The reasons just outlined lead us to expect that those individuals with a high price of time and a low net money price (net of insurance) will tend to use providers with a high gross price. We measure the price of time by the wage rate and the net price by the coinsurance rate. The tendency to use higher price providers will also be greater the greater the non-wage income of the individual, if amenities are associated with gross price.

Non-wage income permits us to distinguish the third reason for price variation from the second and fourth. If amenities are the sole cause of price variation, non-wage and wage income should have the same coefficient. If price is higher solely because of less queueing or because individuals with a higher price of time search less, then wage income should be positively associated with price, but non-wage income should not be associated with price. If all explanations play a role, the coefficient of wage income should exceed that of non-wage income. Family size is entered and we expect a negative sign. Larger families have fewer resources per person, and lower information costs within the family permit more efficient search.

Individuals who expect to use many services will have an incentive

to search for cheaper providers. We enter actual services used (as an endogenous variable) as a measure of anticipated use; we expect that this variable will be negatively related to the deviation of actual price from the average price of the usual source of care.

We have also entered four regional dummy variables to control for regional differences in medical prices.

It is possible that education improves efficiency of searching by more or less than the average amount by which it improves efficiency in other non-market activities. Therefore, we have entered education as a control variable. If, for example, education raises efficiency by less than an average amount, we would expect a positive sign on the education variable.

III. PROBLEMS OF ESTIMATION AND OPERATIONAL SPECIFICATION OF THE MODEL

Because of the endogeneity of individual insurance and price, ordinary least squares (OLS) is inconsistent. We present results using both OLS and two-stage least squares (TSLS).

We view the hospital admission and hospital length of stay decision as made sequentially. Because the admission decision has some special characteristics, we have deferred its estimation and take it up in another study (Newhouse and Phelps, 1974a). In this report we estimate the price and income elasticities for length of stay, conditional on admission. Nor have we estimated an equation explaining no use or any use of ambulatory physician visits, although this is much less limiting, because most individuals (80 percent) use physicians, despite having little insurance. Nonetheless, the results we present for physician visits also are conditional on some usage.

Because of the problems associated with measuring a time price for non-participants in the labor force we have excluded such individuals from the equations in this report. (This is also the solution adopted by Grossman.) We have, however, included these individuals in work reported elsewhere (Newhouse and Phelps, 1974a).

To derive our estimates of price and income elasticities, we use the 1963 survey of the Center for Health Administration Studies (CHAS) at the University of Chicago. This survey is described in Andersen and Anderson (1967). It is a probability sample of 7803 individuals in 2367 families and gives their utilization of medical services as well as their insurance coverage during 1963. The advantage of these data, relative to all other survey data known to us, is the richness of detail available concerning the terms of the insurance policies covering each individual. Generally, survey data do not permit one to calculate the marginal coinsurance rate. As a result, researchers have used as explanatory variables the insurer issuing the policy (Ro, 1969), the average coinsurance rate (Feldstein, 1971), or simply the percentage of a geographic area insured (Davis and Russell, 1972). However, these

variables introduce inconsistencies into the estimates of elasticity (Newhouse and Phelps, 1947b).

The 1963 survey attempted to verify the existence of and charges for all inpatient utilization as well as the policies the individuals held. If the family responded that it did not have a policy (609 families), no verification was attempted. For all other families the insurance carrier was asked to verify all policies held by the family and their terms. Verification was complete for 970 additional families. No verification was received for at least one policy for 788 families. For lack of information on insurance policies, we have excluded individuals in these families, who tended to be employed in large firms. Since large firms have systematically better insurance than small firms (Phelps, 1973), this biases upward the mean level of coinsurance held in our (unweighted) sample. Because elasticities may fall with coinsurance (the budget share in (5) will fall if price elasticities are less than 1), we have weighted our sample by income and work group size so that it is representative of the population. This prevents a potential upward bias in our elasticities.[1] If elasticities do fall as coinsurance falls, our estimates are biased *upward* relative to what changes in current insurance might produce, since insurance has generally improved since 1963. These hypotheses can be tested more formally when data from a 1970 survey conducted by CHAS become available.

The exclusion of non-labor-force participants may result in a downward bias in our elasticity estimates. If non-labor-force participants have a lower price of time (Phelps and Newhouse, 1973)[2] on average than

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[1]The sample is weighted according to the national distribution of income and work group size relative to sample proportions.

There is very little evidence on how elasticities change with the coinsurance rate. From evidence presented in Phelps and Newhouse (1973), one can infer that elasticities fall as coinsurance falls in the range of 25 to 10 percent coinsurance.

[2]One would expect that for individuals with a low price of time, changes in the money price would represent a larger relative change in price than individuals with a high price of time. For some evidence that this effect can be observed empirically, see Phelps and Newhouse (1972), where it was found that female dependents reduced their demand for outpatient services significantly more than all other groups (among the other groups there were no significant differences) when a coinsurance rate of 25 percent was imposed in a plan in which all services had previously been free.

individuals included in our sample, a downward bias would be expected. However, preliminary work in Newhouse and Phelps (1974a) indicates that there is no large effect from excluding non-labor-force participants, and that, if anything, the estimates are too high when non-labor-force participants are excluded.

Because we did not wish marginal price to vary, we excluded individuals with deductibles in their insurance policies, as explained above. We have also excluded individuals in our sample whose expenditure exceeds the limits of their insurance policies. This exclusion occurs because of our imperfect ability to measure health status. For example, if an individual's insurance policy only paid for 30 days of hospitalization, and the severity of his illness meant that he had to remain 60 days, we would observe an individual with a very long stay and a 100 percent marginal coinsurance rate. It is even possible (we do not know) that if these individuals were included, a positively sloping demand curve would have been estimated. There should be no effect on our estimates from excluding these individuals if there is no interaction between health stock loss (total expenditures) and price elasticity. If, however, those with severe illness respond less (more) to price than average, the effect of this exclusion is to bias our estimates away from (toward) zero.

We have also limited the range of variation in the wage income variable.[1] We excluded all individuals whose wage income exceeded $500 per week, on the grounds that the wage income of such individuals was likely to be measured with error and that if it was not, our functional form was likely to be inappropriate for them. The wage rate is measured per week, since we do not have hours worked per week available to us. Insofar as labor supply adjustment takes place in weeks worked rather than hours per week, this is the appropriate variable.[2]

Because we did not wish to impose a functional form on non-wage

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[1] For lack of instrumental variables we have not attempted to exclude transitory components from either our wage or our non-wage income measures.

[2] It is, however, not appropriate if the average weekly wage does not equal the marginal weekly wage, which would be true in seasonal industries. To take account of this is a refinement of our estimates we have not made.

income, we divided the sample at a value of $3000 per year. As a result, there are two non-wage income variables, one with a coefficient for those with non-wage incomes greater than $3000 per year, another for those with incomes less than $3000 per year. (There is also a dummy variable that permits the intercept to shift for those earning more than $3000 per year.)

The coinsurance rates were computed from those reported by the insurance company. In cases in which the family held more than one policy, we checked to see which policy would apply to the marginal expenditure: We have entered the room-and-board coinsurance rate times mean expenditure[1] as the cross-price term in the outpatient visit equation and the M.D. office coinsurance rate times physician office price as the cross-price term in the length-of-stay equation. In equations explaining price of provider selected, only the coinsurance rate applicable to that provider is entered.

Health status is measured in two ways. Respondents were asked whether they would characterize their health status as excellent, good, fair, or poor. This measure of self-perceived health status was entered in dummy variable form. The second measure was the number of self-reported disability days the individual had suffered in 1963. These variables measure different phenomena than a clinical examination would, but these may be the more relevant measures.[2]

In the price equations (but not the utilization equations) we have excluded individuals who sought care for which there was no charge made by the provider (some 10 to 15 percent of the sample). This was done

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[1]Mean expenditure in the outpatient visit equation refers to the mean room and board expenditure across the sample. We were forced to use mean expenditure, since most individuals who used outpatient services did not use hospital services; the effect is simply to rescale the room and board coinsurance rate variable.

[2]In part, the difference between these measures and a clinical examination has to do with prognosis; a patient may have terminal cancer but feel well and be unaware of it; he may also feel nauseated with a common cold but be well the next day. Insofar as this is the difference, it is the individual's perception of his health status that motivates utilization, not necessarily his expected health over future time periods, which a clinical examination might reveal.

of necessity, because there is no gross price variable for such individuals.

Table 1 shows all included variables, the units in which they are measured, and their expected sign. The means, standard deviations, minima, and maxima of all variables are shown in Appendix B. Appendix B also shows the number of observations excluded by the various restrictions.

Table 1

EXPLANATORY VARIABLES

Explanatory Variable	Units	Expected Sign, Comments
Utilization Equations		
Marginal own-price	$	Negative
Marginal cross-price	$	Not signed, depends on sign of σ_{ij}
Wage rate	$/week	Positive
Non-wage income	$/year	Zero
Education	Highest grade completed (dummy variables for intervals)	Negative (if η < 1)
Age	Years (dummy variables for intervals)	Positive (if depreciation increases with age)
Family size	Individuals	Zero
Sex	1 = female, 0 = male	No prediction
Race	1 = non-white, 0 = white	No prediction
Health status, self-perceived	Dummy variables	Negative
Disability days	Days	Positive
Beds/population	Population in 1000s	Positive in length-of-stay equation
Physicians/population	Population in 1000s	Positive in office visits equation
Price Equations		
Own coinsurance rate, if defined	Proportion; 0 if not defined	Negative
Internal dollar limit per day, hospital equation only	$; 0 if not present	Positive
Full semi-private room dummy, hospital equation only	1 if insurance policy is of this type; 0 otherwise	No prediction
Wage income	$/week	Positive
Non-wage income	$/year	Positive if amenities play a role, otherwise zero; elasticity less than wage income
Education	Highest grade completed	No prediction (control for possible non-neutrality of education's effect on non-market productivity)
Family size	Individuals	Negative
Race	1 = non-white, 0 = white	No prediction; non-whites may face different market
Regional dummy variables		No prediction; control for regional price variation

IV. RESULTS OF ESTIMATION

Price and wage income elasticities from this estimation are shown in Table 2; the complete equations are given in Appendix A. In general, the price elasticities (at the mean) estimated using TSLS are near zero and not significantly different from zero, while the OLS estimates are rather small, but generally significant.

Table 2

OWN-PRICE, CROSS-PRICE, AND WAGE-INCOME ELASTICITIES--HEADS ONLY[a]

	Hospital Length of Stay (n = 76)		Physician Office Visit (n = 563)	
	TSLS	OLS	TSLS	OLS
Hospital coinsurance x price of bed	-0.29 (1.89)	-0.13 (1.28)	-0.10 (1.08)	-0.12 (3.04)
M.D. office coinsurance x price	+0.20 (1.13)	-0.09 (0.79)	-0.03 (0.21)	-0.10 (2.70)
Wage income per week	-0.35 (1.46)	-0.15 (0.53)	0.07 (0.93)	0.08 (0.99)
	Room and Board Price (n = 57)		**Physician Price (n = 517)**	
	TSLS	OLS	TSLS	OLS
Coinsurance rate	-0.04 (0.66)	-0.03 (0.56)	0.26 (0.56)	-0.25 (2.25)
Price per day limit in $	0.08 (0.77)	-0.0004 (0.006)	--	--
Wage income per week	-0.08 (0.33)	-0.07 (0.32)	0.14 (1.31)	0.13 (1.61)

[a]t-statistics in parentheses. For TSLS the t-statistics are the Dhrymes alternative t-statistics (Dhrymes, 1969). The method of selecting the sample is described in Appendix B.

HOSPITAL LENGTH OF STAY

The own-price elasticities at the mean for hospital length of stay are estimated to be -0.29 using TSLS and -0.13 using OLS. OLS should be biased away from the TSLS result (Newhouse and Phelps, 1974b), yet the TSLS result is larger in absolute value; consequently, we feel that the TSLS result is likely to be too high, though how much too high is difficult to say. The cross-price elasticity changes sign between the two estimators and is not significantly different from zero.

Wage income elasticities are negative but not significant at conventional levels. The negative wage income elasticity by itself does not contradict Grossman's investment model because that model applies to all medical expenditure. It does not necessarily apply to any particular component of medical expenditure. Moreover, when observations on individuals who are not in the labor force are added, wage elasticities become positive (Newhouse and Phelps, 1974a). (The negative sign on wage income could also come from a downward bias because of imperfections in measuring health status and the decline in income usually associated with sickness.) Non-wage income elasticities are not significant.

The effect of other variables is shown in the complete equation in Appendix A. Length of stay increases with age, is shorter for females, and is shorter for married individuals. This is consistent with the effect of these variables taken one at a time in the data gathered by the National Health Survey (Gordon, 1973). There is no relationship apparent with education nor with self-perceived health status; evidently self-perceived health status is too crude to measure differences in health status among the hospitalized population. (It is, however, quite important for physician visits and hospital admissions, as described below.) There is some indication that hospital stays are shorter if there are more physicians in the county of residence; the bed/population ratio may exert some positive effect on length of stay, although it is difficult to tell in these results. The positive effect is clearer when individuals not in the labor force are added (Newhouse and Phelps, 1974a).

HOSPITAL ROOM AND BOARD PRICE

The elasticity of the room and board price is near zero in both OLS and TSLS. The OLS result again shows a somewhat smaller elasticity; a change from no insurance to full insurance is estimated to increase price per day by around 20 percent. (A similar but significant result obtains when non-heads are included (Newhouse and Phelps, 1974a).) Neither wage nor non-wage income elasticity is very different from zero. We infer that neither amenities nor time saving from shorter queues are very important in explaining the deviation of the room and board price, given the type of accommodation. Weighted hospital days are negatively related to the price; those who are in the hospital longer tend to use cheaper hospitals, given the type of accommodation.

PHYSICIAN VISITS

It is difficult to estimate demand for physician services from these data because 90 percent of the sample had no insurance for physician services.[1] As a result, there is little price variation. The elasticities using TSLS are small and not significantly different from zero; the OLS elasticities (own-price and cross-price) are around -0.1 and quite significant. Because both price and insurance are endogenous, one could argue that there is a bias away from zero in the OLS results. However, other work we have done persuaded us that this elasticity is at least as high as -0.1 (Phelps and Newhouse, 1972; Newhouse, Phelps, and Schwartz, 1974). Wage income elasticities are small and not significant, non-wage income is also not significant except for the 5 percent of the sample with non-wage income greater than $3000, in which case the elasticity is 0.07 and quite significant in both OLS and TSLS. Health status variables are the most closely related to visits. Visits steadily increase as self-perceived health status worsens; they also increase with disability days. Additional physicians show a weak positive relationship with visits, but beds show none. Non-whites and females have more visits.

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[1]This may explain the near zero cross-price elasticity in estimating cross-price in the length of stay equation.

PHYSICIAN PRICE

The physician-visit price appears quite responsive to coinsurance; in OLS the elasticity is -0.25 and significant; the TSLS result is of the wrong sign. An increase in insurance from no coverage to full coverage increases the price per (weighted) visit by about 30 percent. Those who visit the physician more frequently seek out lower priced physicians; the elasticity with respect to the number of visits is -0.11 (OLS). Wage income has a positive effect bordering on significance. The effect becomes very significant when non-heads are included (Newhouse and Phelps, 1974a). Non-wage income has no effect. We interpret this to mean that a higher priced physician means less time spent in search or in a queue, and not additional amenities. The physician/population ratio has a very strong and positive relationship to price. We have not yet attempted to treat this variable as endogenous, and therefore its interpretation must remain ambiguous.

V. CONCLUDING REMARK

This report has presented a theoretical basis for estimating price and income elasticities and has also presented preliminary estimates of those elasticities. The estimates are by and large consistent with the theory, but because of small sample sizes, the precision of the estimates leaves much to be desired. However, preliminary estimates with a considerably larger sample show results that generally support those in this report (Newhouse and Phelps, 1974a).

Appendix A

COMPLETE UTILIZATION AND PRICE EQUATIONS

Table A-1

UTILIZATION OF HEADS OF HOUSEHOLDS

Explanatory Variable Coefficient (t-Ratio) (Elasticity)	Dependent Variable = Hospital Days; n = 76; Heads Only (weighted by average price of type of room)		Dependent Variable = Physician Office Visits; n = 563; Heads Only (weighted by average price of type of room)	
	Eq. 1 TSLS	Eq. 2 OLS	Eq. 3 TSLS	Eq. 4 OLS
Hospital coinsurance x price of bed	-0.25 (-1.89) η = -0.29	-0.11 (-1.28) η = -0.13	-0.038, η = -0.10 (1.08)	-0.046, η = -0.12 (3.04)
M.D. office coinsurance x price	0.54 (1.14) η = 0.20	-0.25 (-0.79) η = -0.09	-0.024, η = -0.03 (0.21)	-0.083, η = -0.10 (2.70)
Wage income/week	-0.024 (-1.46) η = -0.35	-0.010 (-0.53) η = -0.15	0.003, η = 0.07 (0.93)	0.003, η = 0.08 (0.99)
Non-wage income	-0.0010 (-0.87) η = -0.05	-0.0017 (-0.95) η = -0.08	0.0003, η = 0.02 (0.98)	0.0002, η = 0.01 (0.64)
Non-wage income if > $3000	0.001 (-0.54) η = -0.02	-0.00037 (-0.12) η = -0.008	0.0015, η = 0.07 (3.44)	0.0015, η = 0.07 (2.40)
Dummy = 1 if non-wage income > $3000	1.77 (0.17)	0.22 (0.01)	-5.93 (2.48)	-5.89 (1.75)
Education 9-11 years	1.58 (0.92)	1.86 (0.73)	-1.00 (2.01)	-0.97 (1.50)
Education 12 years	-1.16 (-0.58)	0.68 (0.24)	-0.25 (0.60)	-0.26 (0.43)
Education 13-15 years	2.69 (0.87)	0.13 (0.03)	-0.09 (0.16)	0.01 (0.01)
Education 16+ years	0.21 (0.09)	1.09 (0.31)	-1.12 (2.08)	-1.05 (1.44)
Age 25-34	2.57 (0.65)	4.49 (0.75)	-1.96 (2.55)	-2.04 (1.89)
Age 35-54	7.19 (1.85)	8.08 (1.34)	-2.04 (2.78)	-2.02 (1.93)
Age 55-64	13.64 (3.00)	15.00 (2.28)	-1.58 (1.96)	-1.58 (1.38)
Age 65+	9.25 (1.84)	14.08 (2.06)	-1.60 (1.70)	-1.56 (1.18)
Family size	-0.097 (-0.21)	-0.33 (-0.48)	-0.10 (0.96)	-0.11 (0.72)
Sex (= 1 if female)	-8.29 (-2.98)	-6.75 (1.63)	1.89 (2.57)	1.90 (1.86)
Race (= 1 if non-white)	3.28 (1.58)	1.72 (0.57)	1.79 (3.34)	1.90 (2.70)
Disability days	0.063 (5.09)	0.058 (3.17)	0.028 (6.01)	0.028 (4.21)
Health status good	-0.39 (-0.18)	1.21 (0.41)	1.38 (4.10)	1.36 (2.88)
Health status fair	-2.47 (-1.03)	-0.54 (-0.16)	3.48 (7.64)	3.47 (5.36)
Health status poor	-5.00 (-1.82)	-2.34 (-0.61)	6.70 (8.16)	6.66 (5.72)
M.D.s/100,000	-0.028 (-1.86) η = -0.35	-0.23 (-1.09) η = -0.29	0.007, η = 0.17 (1.64)	0.008, η = 0.18 (1.65)
Beds/1000	0.48 (1.71) η = -0.26	0.28 (0.72) η = -0.15	-0.05, η = -0.04 (0.63)	-0.03, η = -0.03 (0.34)
Married	-6.12 (-2.10)	-2.95 (-0.75)	1.35 (1.94)	1.42 (1.45)
Constant term	10.03 (1.69)	4.84 (0.64)	3.80 (2.88)	4.04 (2.30)
R^2	--	0.45	--	0.23
Corrected R^2	--	0.20	--	0.20
Dhrymes F	4.29	--	12.46	--
(d.f.)	(24,8)	--	(24,8)	--
t-ratio adjustment factor	-- 1.70	-- --	1.43 --	-- --
F	--	1.76	--	6.89
(d.f.)	--	(24,51)	--	(24,538)

Table A-2

PRICE OF CARE EQUATIONS, HEADS OF HOUSEHOLDS ONLY[a]

	Hospital Room and Board (n = 57)		Physician Office Visit (n = 517)	
	TSLS	OLS	TSLS	OLS
Room and board coinsurance rate	-11.23, η = -0.04 (0.66)	-8.28, η = -0.03 (0.56)	--	--
Number of hospital days	-0.72, η = -0.13 (1.15)	-1.09, η = -0.19 (2.40)	--	--
Maximum payment per hospital day	0.50 (0.77)	-0.003 (0.006)	--	--
Dummy (= 1 if no limit on $/day)	42.31 (1.23)	17.07 (0.84)	--	--
Physician office visit coinsurance	--	--	2.68, η = 0.26 (0.56)	-2.49, η = -0.25 (2.25)
Number of physician office visits	--	--	0.17, η = 0.10 (0.76)	-0.18, η = -0.11 (2.49)
Wage income	-0.030, η = -0.08 (0.33)	0.023, η = 0.07 (0.32)	0.01, η = 0.14 (1.31)	0.009, η = 0.13 (1.61)
Non-wage income (0 if > $3000)	0.008, η = 0.07 (1.16)	0.006, η = 0.06 (1.06)	0.0002, η = 0.008 (0.28)	0.0002, η = 0.007 (0.31)
Non-wage income > than $3000	0.013, η = 0.07 (1.08)	0.008, η = 0.04 (0.70)	-0.002, η = -0.05 (1.19)	-0.001, η = -0.03 (0.93)
Dummy = 1 if non-wage income > $3000	-47.21 (0.75)	-20.78 (0.36)	10.36 (1.24)	6.10 (0.98)
Education 9-11 years	-4.49 (0.40)	-1.33 (0.13)	0.88 (0.60)	0.61 (0.54)
Education 12 years	-5.08 (0.48)	-4.93 (0.49)	1.41 (0.94)	0.70 (0.63)
Education 13-15 years	-34.88 (1.71)	-29.75 (1.61)	4.49 (2.55)	3.87 (2.92)
Education 16 years	-8.20 (0.52)	-6.37 (0.44)	1.41 (0.79)	0.47 (0.35)
Family size	0.75 (0.29)	0.29 (0.12)	0.06 (0.20)	0.004 (0.02)
Northeast	-22.40 (1.53)	-22.40 (1.62)	-3.10 (1.64)	-2.11 (1.63)
North Central	-29.59 (1.99)	-27.63 (1.99)	-2.61 (1.19)	-0.98 (0.76)
South	-38.62 (2.12)	-35.62 (2.15)	-2.00 (0.97)	-0.53 (0.40)
Mountain	-31.77 (1.22)	-23.80 (1.01)	-2.35 (0.71)	-0.03 (0.01)
Physician/population	-0.01, η = -0.03 (0.11)	-0.001, η = -0.002 (0.01)	0.04, η = 0.50 (2.82)	0.04, η = 0.57 (4.21)
Beds/population	1.20, η = 0.13 (0.73)	1.11, η = 0.12 (0.71)	0.22, η = 0.11 (0.84)	0.17, η = 0.09 (0.84)
Constant	73.93 (3.06)	72.82 (3.21)	-0.58 (0.13)	4.70 (2.22)
R^2 Corrected	--	0.41 0.11	--	0.12 0.09
Dhrymes F (d.f.)	1.17 (19,18)	--	2.18 (17,20)	--
t-ratio adjustment factor	0.99	--	0.80	--
F (d.f.)	--	1.37 (19,37)	--	4.13 (17,499)

[a]Excluding those who received care for which no charge was made.

Appendix B
SUMMARY STATISTICS

We arrived at the sample used to estimate these equations as follows. There were 2376 heads of households; of these, 788 had unverified insurance and so were excluded; 13 had more than three insurance policies. This last group was excluded for computational reasons, leaving 1566 heads. This subsample of 1566 of the national probability sample whose insurance was verified is not representative by work group size and income of the entire population. Therefore, we weighted the sample along these dimensions to be representative of the national population. To obtain the sample of 76 for the length-of-stay equation, we applied the following restrictions to the 1566 sample (the numbers in parentheses are the number of the 1566 excluded by the restrictions); zero wages or wages greater than $500 per week in 1963 dollars (475); no hospital days or hospital days exceeding 40 days (1443); physician office visit price greater than $50 per visit (1); positive deductible in the hospital policy (92); expenses exceeding upper limit of policy (3). Some individuals were excluded for more than one reason.

The physician visit equation started with the same 1566 heads, which were reduced to 563 by the following restrictions: zero wages or wages greater than $500 per week in 1963 dollars (475); physician office visit price greater than $50 per visit (1); no physician visits or physician visits exceeding 30 (717); positive deductible in insurance policy applying to physician visits (67). The numbers are reduced for the price equation by the number of individuals who obtained care for which no charge was made.

Table B-1

SUMMARY DATA STATISTICS--EXOGENOUS VARIABLES

Variable	Mean	Standard Deviation	Maximum	Minimum	Number of Zeros
M.D.s/100,000	115.63	49.96	213.0	15.0	0
Beds/1000	4.28	2.14	11.0	0	29
Married	0.77	0.42	1	0	137
Non-wage income (NWY)	286.69	568.02	3,000	0	343
Dummy: NWY > $3000	0.043	0.20	1	0	536
Disability days	10.98	33.11	351	0	231
Wage income/week	118.76	71.73	480.77	3.85	0
Sex	0.17	0.37	1	0	464
Family size	3.41	1.77	11	1	0
Race	0.10	0.30	1	0	501
Size of work group (coded value)	5.40	2.59	8	0	8
Age 25-34	0.23	0.42	1	0	440
Age 35-54	0.50	0.50	1	0	287
Age 55-64	0.16	0.37	1	0	472
Age ≥ 65	0.06	0.24	1	0	522
Education 9-11 years	0.17	0.38	1	0	463
Education 12 years	0.27	0.44	1	0	419
Education 13-15 years	0.14	0.35	1	0	488
Education 16+ years	0.15	0.36	1	0	480
Professional	0.15	0.36	1	0	484
Manager	0.18	0.39	1	0	456
Sales	0.17	0.37	1	0	468
Foreman	0.32	0.47	1	0	389
Agriculture-mining-construction	0.16	0.37	1	0	459
Manufacturing	0.25	0.43	1	0	435
Finance	0.065	0.25	1	0	527
Public administration	0.20	0.40	1	0	454
Entertainment	0.009	0.095	1	0	558
Health status good	0.42	0.49	1	0	330
Health status fair	0.16	0.37	1	0	467
Health status poor	0.042	0.20	1	0	536
NWY if over $3000	214.91	1070.26	10,000	0	536

[a]For the sample of 563 heads with physician office visits.

Table B-2

SUMMARY DATA STATISTICS--ENDOGENOUS VARIABLES

Variable	Mean	Standard Deviation	Maximum	Minimum	Number of Zeros
Hospital length of stay (n = 76)					
Hospital days	8.58	7.33	35	1	0
Weighted hospital days	8.43	8.04	43.52	0.49	0
Hospital gross price (unweighted)	43.61	23.42	118.16	6.39	0
Net price (weighted)	9.82	12.71	36.19	0	32
Hospital price (n = 57)					
Hospital days	7.49	6.84	35	1	0
Weighted hospital days	8.31	8.28	43.52	0.49	0
Hospital gross price	46.27	20.69	121.00	9.09	0
Weighted hospital gross price	46.60	25.47	118.16	6.39	0
Marginal coinsurance	0.15	0.27	1	0	30
Price per day limit	7.75	8.96	30	0	29
Physician office visits (n = 563)					
Weighted visits	4.96	5.35	31.14	0.75	0
Gross price (unweighted)	7.53	8.59	96.35	0	46
Net price	5.89	6.86	48.17	0	100
Physician office visit price (n = 517)					
Unweighted visits	4.94	5.12	30	1	0
Weighted visits	5.04	5.26	31.14	0.75	0
Visit gross price	8.29	8.73	100.00	0.60	0
Weighted visit gross price	8.45	8.95	103.79	0.62	0
Marginal coinsurance	0.83	0.36	1	0	54

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