INSTITUTE FOR RESEARCH ON POVERTY DISCUSSION PAPERS

159-73

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The research reported here was supported by funds granted to the Institute for Research on Poverty at the University of Wisconsin by the Office of Economic Opportunity pursuant to the provisions of the Economic Opportunity Act of 1964. The opinions expressed herein are those of the author.

Abstract

Using data obtained from a National Center for Health Statistics Household Health Survey, a model for children's medical care utilization was tested. The variables included in the model were need, physician supply, family preference, and family disposable income. The first question addressed was the income effect on children's visits to physicians. Based on a Multiple Classification Analysis, the unadjusted income effect was considerably diminished except for those children whose per capita family income was $2,500 or more (equivalent to a family income of at least $10,000 for a family of four). Family preferences--as indicated by parents' education and number of children--accounted for most of the reduction. The second question was the effect of other parts of the model on children's visits to the physician. The analysis suggested that need--as indicated by the age of the child--and family preferences had the largest effects on children's medical care utilization.

This analysis brings into question the direct effect of poverty on health care, an assumption of policies to increase health care for the poor. It suggests that the less frequent utilization of physicians by lower income persons is largely due to their lesser preference for that care and not their lesser command of resources. Thus, policies directed to making medical care available to the poor at a lower price are not likely to lead to greatly increased utilization by the medically deprived.

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Introduction

A recent review of the published information on the effects of poverty on medical care (Lefcowitz, 1973) concludes that the available evidence did not support such a relationship, particularly with respect to children. In the case of children, family head's education appeared to have a greater effect than total family income. (See Table 1 for data on physician visits.) As can be seen, the effect of income on children's visits to physicians varies widely and not consistently by educational level, while the average number of visits increases consistently with increasing education of head regardless of income. In the earlier paper, the suggestion was made that health and health care is more a function of life style, of which education is an indicator, than access to a market basket, of which income is an indicator.

However, the data used in the article mentioned above, were limited in two ways. First, they fail to take account of family size. At any income level, the amount of money available for consumption of medical care after expenditures for other basic goods and services will vary with the number of people in the family. An analysis of the effect of income on children's visits to physicians should, thus, take family size into account. Second, a more complete model should also take into account the supply of medical care, the need for care, and other indicators of taste besides head's education to obtain a more precise estimate of the income effect on health. (For a description

of similar models see Elesh and Schollaert, 1972a; and Schieber and Kelly, 1971.)

An opportunity to do the necessary multivariate analysis was presented by the availability of an extract from the National Center for Health Statistics 1967 household survey tape.[1] However, because the extract tape was constructed to analyze hospital costs, the full range of data from the National Center's household survey is not available. Of particular importance, items on illnesses and days restricted by illness were omitted. To that extent, therefore, the analysis is limited. Using the data in this tape, this paper will address two questions:

1. Does disposable income, as measured by family income in relation to family size, affect the number of children's visits to physicians when other variables which may affect the quality of medical treatment are taken into account?

2. What is the effect of need for care, supply of care, and preference for care on children's visits to the physician?

Before presenting the analysis, however, the medical care model and the indicators of its components will be discussed.

A Medical Care Model

Need

Undoubtedly, the single most important factor in medical care utilization is perceived need. That perception of the need is what is operative follows from the truism that not all who need medical care seek it; and not all who seek it need the care in a purely physical health sense. In general, however, there is undoubtedly a positive correlation between need and

utilization. Thus, for example, persons with chronic conditions which limit their activity visit physicians more often on the average than persons not limited, and the greater the limitation, the more frequent the visits (National Center for Health Statistics, 1972a:26). Moreover, perceived need is typically in response to symptoms of illness. Most visits to physicians are for diagnosis and treatment rather than for more preventive reasons. About three-fourths of all visits are for diagnosis and treatment in contrast to 15 percent for general check-up or immunization and vaccination (National Center for Health Statistics, 1972a:33).

As stated earlier, however, data on reported conditions of illness and days of illness, which would provide a direct measure of perceived need, are not available. Age, however, is associated with real as well as perceived threats from disease and illness -- the younger the child, the greater the threat. That children under one year of age are most vulnerable is apparent from their high death rate compared with children over one. (In 1967, 22.3 per 1,000 for those under one compared with less than 1 per 1,000 for those over one, National Center for Health Statistics, 1969:1-4.) The incidence of acute conditions is also greater among younger children (National Center for Health Statistics, 1971:6). The greater threat of disease for younger children may be indicated by the fact that children under five years old had on the average 1.67 physician visits per acute condition compared with 1.13 visits for childred age five to fourteen (estimate based on data in National Center for Health Statistics, 1971).

Need, however, can also be in anticipation of future possibilities. Thus, physician visits of children under five years of age are more likely to be for a general check-up or immunization and vaccination than visits

of children five to fourteen years old (27 percent to 16 percent, National Center for Health Statistics, 1972a:33). Children under six are also more likely than those six to sixteen years of age to have had a routine check-up in the past year (45 percent compared to 31 percent, National Center for Health Statistics, 1965b:46).

The evidence seems clear, therefore, that either in fact or in a parent's perception, the need for medical care among children decreases as the child's age increases. Given that relationship then, it is not surprising that younger children visit physicians more frequently on the average than do older children (5.7 visitis per year for those under five compared with 2.8 for five to fourteen year olds , National Center for Health Statistics, 1972a:5).

Need may also be a function of the child's environment. Whether rural life is more healthy than urban life is questionable. Farm children do have fewer reported acute conditions than nonfarm children and children from Standard Metropolitan Study Area's (SMSA) more than those who live outside SMSA's. "However, since an acute condition was counted only if it involved either an activity restriction or medical attention, the differences in rates may also reflect differences in the degree to which people in the three areas restrict activity or consult a physician when an illness strikes." (National Center for Health Statistics, 1971:8). Consulting a physician may also be a function of the available supply and the time cost involved both of which will be discussed later. Moreover, the height and weight of children six to eleven years of age do not differ with respect to residence (National Center for Health Statistics, 1972:13-15. For a discussion of size as an indicator of health see pp. 25-28 in the same work.)

It has also long been argued that white and nonwhites have different medical needs because they are differentially exposed to threats to health. This differential exposure is particularly manifested in infant mortality rates, but not in morbidity (Sutton, 1971). One possibility, of course, is that the surviving nonwhites are on the average more fit than their white counterparts. In any case, need -- as measured by mortality rates -- is greater at the very young ages for nonwhites compared with whites.

Finally, the number of children in the family may also be related to perceived need. As parents acquire experience with the symptoms of illness, they may see many symptoms as less threatening and, therefore, have less need to call the physician for diagnosis and treatment and to rely more on their own judgment. Need, then, will be represented primarily by age, although residence, race, and number of children amy also be, in part, indicators.

Supply of Physicians

The disparity in supply of physicians between rural and urban areas is almost too well-known to merit documentation. What is less well-known is that this difference is almost completely a result of a difference in the distribution of full-time specialists and physicians full-time in hospitals (Stewart and Pennell, 1960:12). However, about 12 percent of all children's visits to physicians are to a hospital clinic or emergency room (National Center for Health Statistics, 1972a:27); and about one out of every six visits is to a pediatrician (estimated from data in National Center for Health Statistics, 1965a:13; and 1966:6).[2] It is not surprising, therefore, that the proportion of children who see a pediatrician at least once during a year varies from almost 25 percent in SMSA's to 4 percent of the children who are farm residents. (National Center for Health Statistics

1966:5). Thus, unavailability of a supply of medical specialists and hospital-based physicians in rural areas may be an important factor in the differential utilization of physicians by residence.

Supply of physicians also varies by region with the Northeast and West having the highest ratio of physicians to civilians (Stewart and Pennell, 1960:5). Whether the regional distribution results from differential urbanization is unknown. Nevertheless, region will be also used as an indicator of supply.

Preference for Medical Care

That people differ in their preferences for goods and services is a truism. Given an assumed connection between health (or at least lack of illness) and medical care, however, one would think that only a few in our society would risk the consequences of an illness unless denied care by its unavailability or by economic circumstances. Nevertheless, orientations to health and health care do vary among people tied to different culture patterns (Mechanic, 1968:117-125). The preference for medical care is part of a modern urban culture which includes a more detached view of and more concern for care of the body and an openness to a scientific approach, both values embodied in medicine. To the extent, therefore, that people are tied into that life style, we would expect their utilization of physicians to vary accordingly.

We do not have data to measure directly preferences for medical care. Some demographic characteristics, however, can by inference be related to hypothesized variations in life style and, thus, of preference for medical care.

Education of Family Heads

Typically, students of health and health care tend to utilize education as just another indicator of socioeconomic status (for example, Ross, 1962, Suchman, 1965). Education does appear, however, to have an effect in the health area independent of other socioeconomic indicators. Thus, Elesh and his colleagues have indicated that physician supply varies significantly in response to the percentage of high school graduates in an area, independent of other variables in their model, including income (1972a, 1972b). As mentioned earlier, variations in medical care or health status were found to be related to education with income controlled (see Table 1 and Lefcowitz, 1973). Feldman observed that education was more highly related to levels of health knowledge than occupation or income (1966).

The implication of the independent effect theory is the hypothesis that education is an important vehicle for socialization into a life style which gives a high preference to medical care. An alternative hypothesis is based on the economist's view that education is an indicator of permanent income. Thus, consumption, including that of medical services, is a function of permanent income. The data in Table 1 are consistent with that hypothesis. There is no direct approach to testing these alternative hypotheses except to show that with respect to other health-inducing behavior the preference hypothesis is more reasonable than the permanent income hypothesis (Lefcowitz, 1973). One possible test is whether the female head's education, independently of the male head's education, has an effect on health care. The wife is probably more instrumental in the health care of children. An independent effect of her education on children's medical care would more likely indicate preference than family's permanent income.

Number of Children

There is evidence that the number of visits to physician per child decreases with family size. For example, in 1968 when family income is under $5,000, persons under 17 years old in families with four or less members average more than four visits compared with less than three visits for children in larger families. (National Center for Health Statistics, 1972c:8). One explanation for the relationship is that it reflects the per capita disposable income and would disappear with a better measure of relative income. Thus, children from low income families on welfare, presumably with medicaid available, tend to have higher utilization rates than similar children not on welfare. Nevertheless, the family size effect remains (National Center for Health Statistics, 1972c:8).

Another possibility is that young, small families are more likely to contain young children. As indicated, younger children average more physician visits, hence resulting in a relationship between family size and average visits for all children. Of course, since the data reported are cross-sectional, many of the small families will be completed ones with a child or two remaining from a larger offspring set. These children are likely to be older and to visit physicians less frequently and, thus, offset the higher utilization of small-sized young families.

The number of children a family has is also some indication of its pattern of preferences. We might expect that, given the same relative access to a market basket, families who have few children would select differently than larger families. For example, Blau and Duncan found that sons in small families have higher educational achievement and thus more occupational success than sons in larger families (1967:302-307). They

later show that this difference is largely attributable to family climate as indicated by oldest brother's educational achievement (1967:316-320). They suggest that small families have more resources to draw upon when a positive attitude toward education is there.

Another interpretation is that small families and positive attitudes toward education are part of the same preference system. Opting for few children indicates a life-style orientation which can best be described as modern urban. Our contention is that education is a mechanism for socialization into that urban life style. Suggestive of this relationship is that urban birth rates are generally uniform across educational levels, but vary by education for women born on farms (Duncan, 1965). More specifically, we have hypothesized that health values and their relationship to medical care are also part of the same general orientation (see Phillips, 1965 for a similar hypothesis). Hence, family size is an indicator of a more general pattern.

Residence, Race, and Age of Head

Other variables that may be indicators of taste are residence, race, and age of family head. Since medical care is basically a phenomenon of modern urban and industrial society, we would expect, other things being equal, that urban residents have a greater preference for medical care than rural persons. We cannot, of course, separate out the other components implicated in residence such as supply of physicians. We shall assume that education performs that function.

Race and age of family head are different, however. Nonwhites are more likely to be recent migrants to urban settings and are thus less likely to

have internalized a life style in which medical care is highly valued. Younger heads of families are more likely to have been socialized within a modern urban culture which gives preference to medical care. Thus, both of these variables can be seen as partial indicators of taste.

Budget Constraints

The primary indicator of disposable income will be per capita family income. However, family type is another indicator of resources. Single parent families, almost all of which are headed by women, are more likely to be on welfare and, therefore, to have access to free or low cost medical care. In low income families, children whose families receive aid had more physician visits on the average than families not on assistance (National Center for Health Statistics, 1972c:8). Hence, we expect that the effect of income would be reduced if family type were not taken into account, particularly at the lowest income level.

Summary of the Model

We intend, therefore, to predict children's visits to physicians using the following model:

Component	Indicator
Need	Age of children -- primary indicator Race--secondary Number of children--secondary
Supply of physicians	Residence, Region } primary indicators
Taste and preference	Education of heads, Number of children } primary indicators Age of head Race Residence
Resources	Per capita family income--primary indicator Family type--secondary indicator

In the analysis below, the relationship of budget constraints as measured by per capita income and physician utilization will be examined first. Then, the relationship of care to the general model will be presented.

Poverty and Children's Medical Care

Table 2 presents the relationship between the various personal and family characteristics on the one hand, and mean physician visits and per capita family income on the other, controlling for age of child as found in the Health Survey extract.[3] The reason for specifying age is that as a primary indicator of need it is undoubtedly the most important characteristic affecting the quantity of children's medical care. On the average children under one year of age have 50 percent more physician visits than children one to five years of age and almost three times as many as children over five. Moreover, this relationship is not uniform across other personal characteristics. For example, the rate decreases more rapidly between infancy and pre-school ages for nonwhites than for whites. The proportion of low income families, however, is fairly uniform across the children's age categories.

Of more importance is that variation in the percentage of children in families with low per capita incomes by other characteristics correspond in general to the variation in mean frequency of visits to physicians for the same characteristics. Thus, children who are nonwhites, rural, from the South, in female-headed families, where the head is older, or who have a large number of siblings present, tend to be both less likely than others to visit physicians and also more likely to be in families with low per capita incomes. Hence, any analysis of the effect of income on medical care ought, as noted above, to take these variables into account.

There are, however, two important deviations from the general pattern. First, among six to seventeen year olds, children in families headed by women had more doctor visits on the average than those in husband-wife families, despite the fact that their families were poorer. It is possible that these families headed by women were on welfare and thus, were not as constrained by their low per capita income as other families in access to medical care.

Second, the child's age does not appear to affect physician visits when the family head is young; nor does the age of the family head appear to be related to medical care when the child is an infant. Yet, families with young heads are somewhat poorer if they include older children and among families with infants the proportion with low income increases as family head's age increases. Among infants need for medical care may be sufficiently clear so that it overrides any effect of family head's age. Among young family heads, those children in the six to seventeen category are most likely near the lower age limit, and thus are nearer to those under six in physician utilization. It may be, also, as was suggested earlier, that young heads are more health-oriented than older ones so that the child's age is less relevant.

We now turn to a multivariate analysis using Multiple Classification Analysis. Based on a regression analysis using dummy variables for the independent variables, estimates of deviations from the grand mean were obtained (Andrews, Morgan, and Sanquest, 1967). The results will be presented as variations from the grand mean of children's physician visits.

As would be expected, since we are trying to account for it, a strong positive relationship between per capita family income and children's mean annual physician visits is observed (Table 3). At the lowest income level, the average number of visits is almost one less than the grand mean compared

with 1.3 more than the grand mean for children in families with greater than $2,500 per capita family income (Table 3). Thus, the difference in mean visits is 2.26 from the lowest to highest income categories. It is important to note, however, that the largest change is between the next to highest and the highest income category--an increase in one visit per child on the average, almost as large as the difference in mean visits between the lowest and next to highest income level.

This upward jump in average annual visits where the per capita family's income exceeds $2,500 does not result from an unusual amount of care at the most extreme income levels. The average number of annual visits is 3.6 when per capita income is $2,501-3,000, 3.4 at $3,001-4,000, and 4.4 where the per capita income is greater than $4,000. Apparently, there is a real threshold in the quantity of medical care for children in families above $25000 per capita income.[4] Consistent with this result is that the percent of families with incomes over $10,000 (equivalent to a family of four with per capita income over $2,500) was positively related to physician supply, net of other variables in their model (Elesh and Schoolaert, 1972a; Elesh and Lazarz, 1972b). Thus, our finding on income and children's visits to physicians above may relfect the availability of medical care in higher income areas.

Now, let us examine what happens to these coefficients when the other variables in the model are introduced.

First, age and family type are introduced -- age as an indicator of need and family type because low income families with female heads may be less constrained in access to medical care. The result is to increase the disparity in children's visits to physicians between the highest and lowest income

categories by about three-tenths of a visit. Taking both of these variables into account, therefore, has the effect of increasing slightly the impact of per capita income on children's medical care.

How this result occurs can be seen in Tables 4 and 5. Among lower income families, medical care tends to decrease more sharply from infancy to pre-school; whereas in the highest income category the decline in care is between pre-school and school age children (Table 4). Whether these differential changes result from differential disposable income or from differences in perceived need can not be determined from the available data.

The effect of family type, however, is different than predicted. There appears to be little difference at the younger ages and low income levels, where comparisons can be made. At older ages, however, children in families headed by women, regardless of income, are more likely to see the physician on the average than children in husband-wife families (Table 5). This difference can not be attributable, therefore, to the availability of medical care through welfare.

Next, residence and region were introduced as indicators of physician supply. As can be seen in Table 3, these variables have a small effect on the per capita income effect on physician visits. The difference between the low and high categories of 2.55 visits on the average per child is reduced to 2.43 visits. Assuming that region and residence are reasonable indicators of physician supply, variation in the availability of care does not appear to account for the relationship between income and physician visits. Of course, income itself may be a better indicator of available supply so that this factor may not have been partialled out (see Elesh and Schollaert, 1972a; and Elesh and Lazarz, 1972b and our earlier discussion).

The preference variables introduced next into the equation were race and age of head which reduced the range to two and one-quarter (2.25) visits. Most of the reduction is produced by race. The change in deviations from the grand mean, however, are generally small and, we can conclude that these two variables account for little of the income effect.

The introduction of number of children and heads' education into the model, from which the results for the income effect on children's visits to physicians come, can be seen in columns D and E of Table 3. Clearly the effect is drastically reduced. The difference between the lowest and highest income categories is now less than one visit. Moreover, most of the difference between the lowest income category and the next to highest ($2,001-2,500) has been eliminated.

To summarize, most of the apparent effect of income on children's visits to the physician can be attributed to the number of children in the family and the education of the male and female heads, variables which we have suggested are indicators of life style. The income effect is not completely accounted for, however, particularly at the highest level. Children in families with over $2,500 per capita income (equivalent to $10,000 for a family of four) are considerably more likely to visit the physician. It may be that the price of medical care is such that it constrains utilization except at the very highest income levels.[5] At that point, the cost relative to income may be such that more families with a lesser preference for care are willing to increase their consumption.

The Full Medical Care Model

Having accounted for per capita income with the exception noted above, what about the effect of the other variables on physician visits? Table 6

presents the results. The first column has the unadjusted deviations; the second contains the deviations from the grand mean net of all variables except number of children, male and female heads' education, and per capita income. The next column adds those variables to the model except for per capita income; and the final column contains all the variables in the model.

Age of Child

There is some reduction in the effect of the child's age on physician visits as the other variables are added to the model. This decrease is primarily due to introducing family head's age and number of children in the family. Since both of these variables are related to child's age -- younger family heads and smaller families have younger children--and to medical care, taking these variables into account cleans up the effect of child's age. Clearly, however, a child's age is still the single variable with the largest impact on medical care. Net of all other variables, the mean annual visits of infants are 4.35 compared with 3.0 for pre-schoolers, and 1.94 visits for school-age children. Given the importance of need for seeking medical care for which age is used as an indicator, this result is not surprising. Apparently, then, when a child requires medical attention, parents obtain it, regardless of other conditions.

Family Type

The unadjusted mean visits of the two family types do not differ. Introduction of other variables result in one-half visit more per child in families with female heads. The variable most important in disentangling the effect of family type is race. The relationship between families headed by women and race is well-known.

Nonwhites also have fewer physician visits than whites, hence, confounding the unadjusted effect of family type. Additional confounding variables were child's age and per capita family income. Families headed by women are more likely to have older children and virtually none of those families have per capita incomes over $2,500. Thus, accounting for those relationships also provides a better estimate of the family effect.

We can only guess at the reasons for the family type effect. Data presented earlier suggests that this effect is primarily for school-age children. Women with older children are more likely to work (Sweet, 1970); also, female heads of families are more likely to work. If a child becomes ill, then the working mother may be more likely to seek medical help in order to reduce the constraints thus placed on her work effort.

This income effect may indeed be greater for working women heading their own families. Thus, physician visits are possibly a mechanism to maintain family income.

Residence and Region

As indicators of supply, region and residence have relatively little effect after adjustment for other variables in the model. Once SMSA is introduced only the West is differentiated from the other regions; and with all the variables in the equation, the maximum difference between any two regions is one-quarter of a visit. The urban-rural difference, substantial when unadjusted, is cut sharply when the full model is operative. The largest drop in net deviations from the grand mean is for rural children after parents' education and number of children are introduced into the model. Notice that there is little effect on SMSA Center City children.

This result is consistent with the hypothesis that medical care is a life style matter tied to a modern urban culture. Education and family size are indicators of the family's relationship to that life style. We expect, therefore, that those variables would intervene more in the rural-medical care relationship than elsewhere.

In essence, however, urban-rural residence and region have relatively small effects on children's visits to physicians. Insofar as they are indicators of supply of physicians, the relative scarcity of doctors is apparently not an important constraint on the quantity of children's medical care.

Race

Net of all the other variables, nonwhite children have, on the average, almost one-half a visit less to the physician than do white children. This difference is apparently not due to a difference in the supply of physicians available to the races (Elesh and Schollaert, 1972a; Elesh and Lazarz, 1972b). One possibility is that nonwhite children--meaning, for all practical purposes, black children--are healthier and need less medical attention. As pointed out earlier, the higher infant mortality of blacks compared with whites, regardless of parents' education and family income (National Center for Health Statistics, 1972d) may result in a survival of the most fit.

Blacks may also be discouraged by past and present discriminatory patterns in the delivery of care to them and hence do not readily seek physician care. Finally, the life-style of blacks may set a relatively low value on medical care. The effect of parents' education and number of children on the nonwhite deviation from the grand mean, reducing it by almost one-half, gives some support to that thesis. Blacks are also more recently

migrants to the cities and may still carry with them the nonurban life style in which modern medicine may have a lesser value than in their present cultural milieu. (See Suchman, 1964 and 1965, on ethnicity and medical care.)

Age of Head

The age of the family head has a strong effect on the children's visits to physicians. Net of all other variables, the average number of visits decreases from 3.2 for children when the head is under 25 to 1.72 if the head is elderly. Of course, there are few family heads over 64 years of age, and less than 5 percent of the children are in families with heads under 25. There is, however, almost half a visit difference between children in the two middle categories.

Much of the reduction in the unadjusted effect of family head's age comes from the introduction of children's age. That may also explain the remaining effect. Children in the six to seventeen category, with younger parents may be in the lower end of that age range, and with older parents in the upper end. It is also reasonable that children in the primary grades are more like pre-schoolers in physician utilization than are teenagers. Hence the difference in physician visits associated with family head's age. Unfortunately, the data made available did not permit finer distinctions in children's age.

Head's age may also reflect, as suggested earlier, differential preferences for medical care. The medical breakthroughs in the last two generations may have produced a population more positive toward the value of medicine in maintenance of health. Younger people have grown up in the post World War II period during which science as a pragmatic effort has

been very visible. For example, the elimination of polio through a major scientific effort received wide publicity in the 1950s. Tranquilizer drugs commanded public attention from the late 1950s through the 1960s. In brief, the public has become more and more concerned about health matters. Today, a large segment of the population considers medical care to be a right rather than a service to be obtained in the market. Persons who were socialized in a milieu in which the preference for medical care was increasing would be expected to themselves place a higher value on care when in a position to choose.

Indicators of Preference for Medical Care

As would be expected from our previous discussion, number of children and parents' education have an important effect on children's physician visits. There is over a full visit per year difference between the smallest and the largest families, and about one visit difference between the children of the least and most educated mothers, net of all other variables. The net effect of head's education, although half the size of the others, is still reasonably large.

In terms of adjustment, child's age accounts for most of what is observed in column B of Table 5. Better educated people, because they are younger, have younger children; and smaller families are more likely to contain younger children. Per capita income also results in further adjustment of the effects of the three variables. Since number of children is built into the definition of per capita income, some adjustment of its effect would be expected when per capita income is introduced. The educational decrease is largest at the highest educational level where income

is taken into account and probably reflects the greater utilization of the highest income group compared with lesser income levels (see Table 3).

All three variables, moreover, have a decrease in effect when the other two are taken into account. The adjustment is slight, but noticeable, for number of children. Given a high correlation between the education of both parents, we would expect some adjustment when the other was introduced into the model. More important, however, is that mother's education has an effect on children's doctor visits independent of head's education. In addition, the effect of mother's education is larger than the one for head's education. This finding is consistent, as suggested earlier, with education as more of an indicator of preference than of life-time income.

Summary and Discussion

In the analysis, we have attempted to answer two questions. First, does the observed relationship between disposable income and children's medical care remain when other factors presumably affecting that care are taken into account? The analysis presented brings into serious question the importance of income resources for physician utilization at least until a relatively high income threshold is obtained. Moreover, the data indicate that uncontrolled effect of family resources on children's physician visits are largely a consequence of numbers of children and parents' education, variables which have been suggested as indicators of life style.

Second, what are the effects of indicators of need, supply of physicians, and preference on children's visits to physicians? Clearly, age, as an indicator of need, is an important factor. The positive effect of families headed by women is also seen as reflecting a need generated by their

circumstances--a hypothesized lack of time to provide care for a sick child. The impact of physician supply on utilization as manifested through residence and region, appears to be negligible. Both, race and the age of the family head have a sizable effect on children's visits to the physician--a consequence, we have hypothesized, of differential preferences although race could also reflect need. The more direct indications of those life-style differences, number of children and parent's educational levels, also have large impact on children's medical care.

We would argue on the basis of the above that given a perceived health need--either in response to illness or for its prevention, life-styles which place a high value on medical care are sufficient to overcome constraints on physician utilization resulting from the price of care and the available supply. In short, health is so highly valued that when threatened, the cost of medical care is not generally a deterrent.

Supply of physicians and disposable income could affect the timing of care. Given relative difficulty in access to physicians, their utilization may be less preventive or at a later stage in an illness. Our data did not permit investigation of this possibility. Insofar as preventive care or early treatment are important to future health, the effect of access on timing of care ought to be investigated. Thus, if we are interested in decreasing disparities in medical care, our analysis suggests that more attention be given to changing the preference for that care than increasing its availability or reducing its price.

FOOTNOTES

[1]The extract had been prepared by the Urban Institute. I want to thank Terry Kelly and George Schieber for their assistance.

[2]The age range for the two sets of information on which this statistic is based were children under 17 for pediatric visits and children under 15 for physician visits. In order to obtain a comparable age base, physician visits for ages 16 and 17 were estimated to be the average volume of physician visits per year of age for the category 5-14 years of age.

[3]The sample of persons under 18 years of age was 50,000. A one in ten sample from the tape was used for the present analysis. Fifty-five were dropped because the number of physician visits were unknown.

[4]Although there is another marked increase after $4,000, the small number of cases--117--does not affect the average for the highest category in general. Nor, does it change our major point that the average number of physician visits increases gradually with increasing per capita income until $2,500 is reached.

[5]Elesh makes a similar point with regard to physician supply. He finds that distribution of physicians is positively related to the percent of families in a census tract with annual incomes over $10,000 (1971, 1972).

[6]Since female heads of families are included in both educational variables, the correlation is inflated in this analysis.

[7]There are, undoubtedly, some groups so isolated from any medical care that even the most serious illness may not receive medical treatment. Such situations clearly require rectification. Our thesis challenges generalizing these rare events into typical situations.

TABLE 1

Number of Visits to Physicians Per Person
Per Year (1969), By Education of Head of Family
and Family Income, for Persons under 15 Years of Age

		Education of Household Head				
Family Income	All	Under 5 years	5-8 years	9-11 years	12 years	13+ years
Under-$5,000	2.8	2.1	2.3	2.7	3.8	4.4
$5,000 and over	3.9	2.4	2.4	3.3	3.9	5.1

Source: U.S. National Center for Health Statistics, 1972a:24.

TABLE 2

Per Person Annual Visits to Physicians and Percentage of Persons with Per Capita Family Income Equal to or Less Than $1,000, by Selected Characteristics

	Mean Annual Physician Visits			Percent with Per Capita Income Equal to or Less Than $1,000		
	Age			Age		
	Under 1	1-5	6-17	Under 1	1-5	6-17
All	4.8	3.2	1.8	31	34	32
Race: White	5.0	3.5	1.9	17	15	15
Nonwhite	3.4	1.9	1.3	50	61	63
Residence: SMSA center	5.2	3.1	1.9	27	29	25
SMSA fringe	5.0	3.8	2.0	17	11	9
Other urban	4.3	2.8	2.0	23	20	24
Rural nonfarm	4.3	2.6	1.6	18	33	34
Rural farm	*	2.0	1.3	*	53	43
Region: Northeast	5.3	3.4	1.9	33	29	25
North Central	4.3	3.1	1.9	21	27	27
South	4.5	2.8	1.6	43	47	46
West	5.3	3.8	2.2	31	28	23
Family type: Husband-wife	4.8	3.2	1.8	21	19	19
Female head	4.0	2.4	2.3	50	66	48
Age of head: Under 25	4.8	4.3	4.4	18	19	26
25-44	4.8	3.2	2.0	22	22	21
45-64	5.3	2.5	1.6	40	35	21
65 and over	*	1.3	1.1	*	54	63
Number of children: 1	4.9	5.3	2.4	11	7	12
2	5.0	3.6	2.5	17	10	6
3	5.7	3.1	1.9	11	16	11
4,5	4.4	2.5	1.6	32	31	24
6 or more	3.1	1.4	1.0	65	64	59

Note:
* Less than 10 cases

TABLE 3

Differentials in Per Person Per Year Children's Visits to Physicians in 1967, by Per Capita Family Income; Unadjusted and Adjusted Deviations from the Grand Mean

Per Capita Family Income	Deviations from the Grand Mean						Number of cases
	Unadjusted	Net of Other Variables[a]					
		A	B	C	D	E	
Under $501	- .95	-1.10	-1.03	- .87	- .54	- .27	616
$501-$750	- .75	- .80	- .77	- .69	- .43	- .25	448
$751-$1,000	- .33	- .35	- .34	- .37	- .22	- .11	495
$1,001-$1,500	- .01	- .05	- .05	- .11	- .13	- .11	1182
$1,501-$2,000	.19	.23	.21	.16	.15	.11	622
$2,001-$2,500	.32	.37	.35	.32	.21	.08	788
More than $2,500	1.31	1.45	1.40	1.38	.96	.67	635
Unknown	- .63	- .52	- .53	- .43	- .46	- .54	158
Deviation range	2.26	2.55	2.43	2.25	1.50	.94	
Grand mean	2.34						

Note:
a A includes age of child and family type
B includes A plus residence and region
C includes above variables, plus race and age of head
D adds number of children to the model
E completes the model with education of male and female heads

TABLE 4

Per Person Annual Visits to Physicians,
by Age and Per Capita Family Income

	Age		
	Under 1	1-5	6-17
Per Capita Family Income			
Under $501	3.1	1.5	1.2
$501-$750	3.4	2.2	1.2
$751-$1,000	3.2	2.7	1.6
$1,001-$1,500	5.0	3.1	1.8
$1,501-$2,000	6.0	3.7	1.8
$2,001-$2,500	5.7	3.5	2.1
More than $2,500	5.9	5.3	2.5
Unknown	*	2.6	1.4

*Less than 10 cases.

TABLE 5

Per Person Physicians Visits by Family Type,
Per Capita Income, and Age of Child

Per Capita Family Income	Age of Child: Under 6** — Family Type: Husband-Wife	Age of Child: Under 6** — Family Type: Female-Headed	Age of Child: 6-17 — Family Type: Husband-Wife	Age of Child: 6-17 — Family Type: Female-Headed
Under $501	1.68	1.82	1.02	1.74
$501-$750	2.29	2.38	1.17	1.67
$751-$1,000	2.73	*	1.46	2.84
$1,001-$1,500	3.45	2.16	1.71	2.39
$1,501-$2,000	3.94	*	1.77	3.21
$2,001-$2,500	3.76	*	2.11	3.10
Over $2,500	5.95	*	2.85	3.56

Notes:

*Less than 10 cases.

**The number of children under one year of age in families with female heads were too few for separate analysis.

TABLE 6

Multiple Classification Analysis of
the Per Person Annual Visits to the Physician

	Deviations from the Grand Mean				
		Net of Other Variables[a]			
	Unadjusted	A	B	C	Number of cases***
Grand mean	2.34				4944
Age: -1**	2.43	2.15	1.96	2.01	224
1-5	.84	.74	.63	.66*	1345
6-17	- .49	- .44	- .38	- .40*	3375
Family type: husband-wife**	.01	- .03	- .04	- .04	4383
female-headed	.00	.35	.39	.48*	509
Residence: SMSA center**	.01	.13	.12	.12	1413
SMSA fringe	.28	.17	.06	.03	1754
other urban	.00	- .09	- .08	- .08	671
rural nonfarm	- .33	- .29	- .16	- .12	820
rural farm	- .84	- .60	- .30	- .24	286
Region: Northeast**	.12	.03	- .01	.01	1144
North Central	- .02	- .08	- .06	- .07	1429
South	- .27	- .10	- .05	- .05	1546
West	.39	.27	.22	.19	825
Race: white**	.14	.14	.08	.07	4174
nonwhite	- .75	- .80	- .44	- .37*	770
Age of head: under 25**	2.09	1.05	.79	.86	201
25-44	.12	.06	.10	.10*	3461
45-64	- .63	- .32	- .35	- .38*	1195
65 and over	-1.08	- .60	- .75	- .62*	87
Number of children: 1,2**	.86	.72	.65	.50	1727
3	.01	- .04	- .08	- .07*	1071
4,5	- .46	- .41	- .36	- .25*	1391
6 or more	-1.16	- .92	- .78	- .63*	704
Education of head: under 9 years**	- .82	- .53	- .24	- .17	1217
9-11 years	.30	- .34	- .26	- .23	990
12 years	.25	.14	.05	.06	1523
13-15 years	.59	.43	.29	.23*	494
16 or more years	.91	.81	.45	.31*	670
Education of mother: under 9 years**	- .96	- .71	- .41	- .36	1024
9-11 years	- .13	- .17	- .01	.02*	1107
12 years	.24	.17	.06	.04	2066
13-15 years	.40	.35	.06	.03*	426
16 or more years	1.31	1.21	.73	.62*	305

Notes:

*Significant at .05 level or higher in regression analysis.

**Omitted category in regression on which multiple classification analysis is based.

***Because the information was sometimes not available, the number of cases for each variable does not always equal the total. The no information categories were included in the analysis but are not presented here.

[a]Column A includes all variables except number of children, both heads' education and per capita income.
Column B adds number of children and parents' education.
Column C completes the model with per capita income.

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