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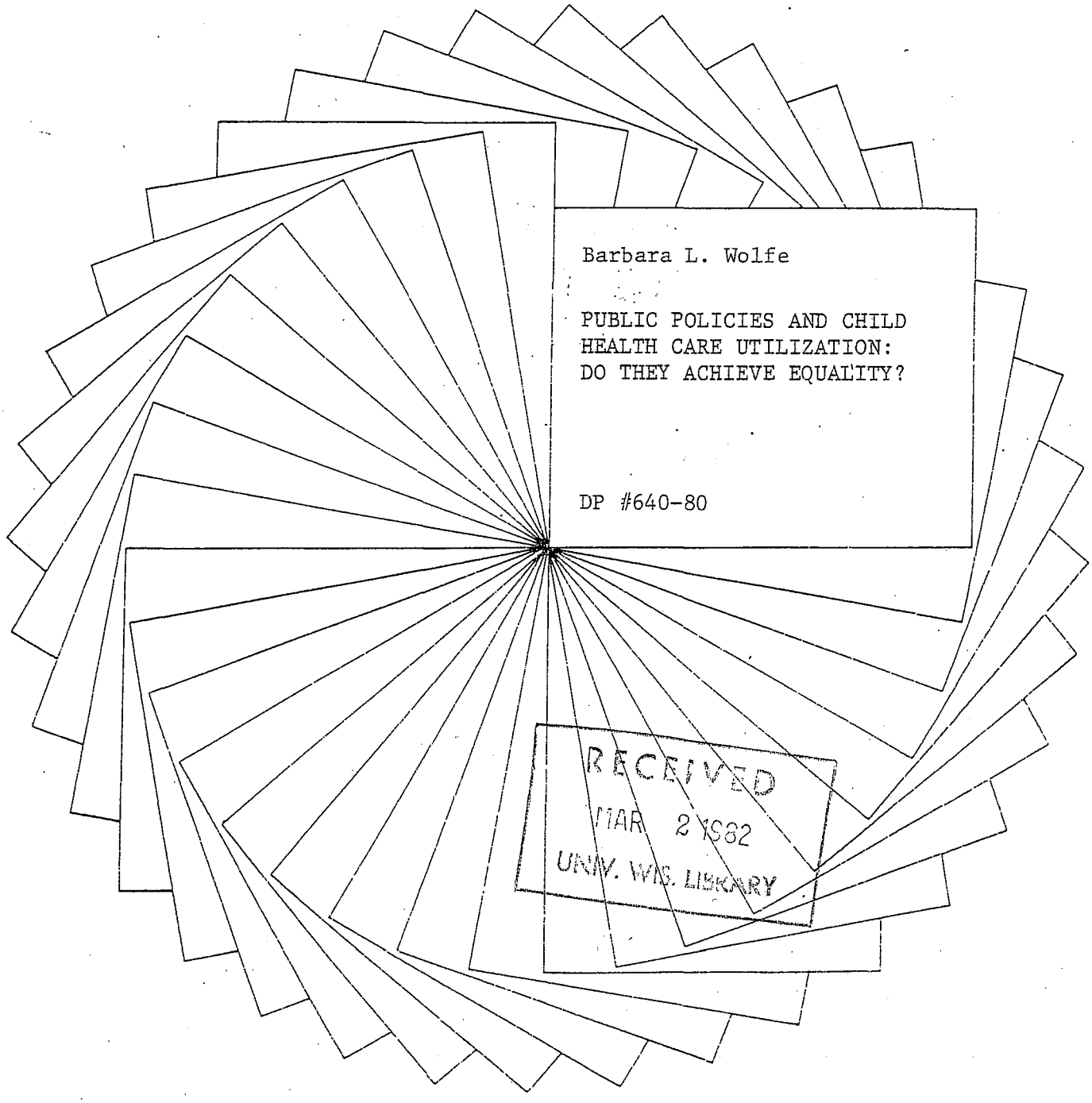

Public Policies and Child Health Care Utilization:

Do They Achieve Equality?

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Abstract

The current policies of Medicaid and neighborhood health centers do not seem to go far enough to achieve the goal of access to equal-quality health care for children aged 1-11. Davis and Schoen (1978) have suggested that Medicaid has increased utilization overall, but racial differences remain. "Medicaid payments per white recipient were 74 percent higher than payments per black recipient." In certain areas poor blacks are more likely to receive benefits than poor whites--a factor that may be explained by the higher proportion of female-headed families among blacks.

This study represents a more detailed view of access to medical care in a county with extensive benefits and a large program committed to pediatrics (Rochester, New York). Thus, it is probably a "better pediatric program" than exists in most other areas.

In terms of overall utilization, a good deal of equality has been achieved. Perhaps this may be partially explained by the existence of several neighborhood health centers which make care accessible in the community. However, children in families who live in areas (census tracts) with higher incomes are more likely to receive care. Children in larger families are less likely to get medical care.

Much sharper differences arise when one looks at the type of providers used. Here income, race, marital status, family size, type of insurance coverage, and community characteristics are all associated

with type of provider used, and the tendency is for the so-called disadvantaged to receive a different type of care; this is true controlling for health status and age. Children who are Medicaid recipients are more likely to use health centers and clinics and less likely to use private practitioners than children with private insurance.

Children with more resources (in terms of income, parents' time, community income, and insurance) appear more likely than other children to use "higher-quality" care. And being nonwhite may limit access to private providers. Thus, what all of this suggests is that while large strides have been made, inequities exist.

Public Policies and Child Health Care Utilization: Do They Achieve Equality?

The health of children is an important determinant of their future well-being. It is also important to society, in that it can be thought of as a form of human capital. Good health, in childhood and after, is likely to be related to higher income and more choice in the use of leisure time than poor health. On the other side, poor health is likely to limit job opportunities and thus to increase the potential need for transfers. Beyond market effects, health may influence the probability of marriage and the characteristics of one's future mate, further influencing income. Some types of poor health may affect the health of others through various public health externalities; for instance, a contagious disease like German Measles causes birth defects. These, too, may require government intervention.

Thus from several perspectives--the desire to create equality of economic opportunity, the effort to control externalities, and the need to increase productivity--there is reason for government to intervene, to seek ways to influence children's health status. Education, nutrition and medical care for pregnant women are all possible strategies for influencing a child's health status. Perhaps the most direct path, however, is through the medical care system affecting the level or type of services received by children--especially those who would otherwise receive too little care.

Programs to provide medical care to children other than the Maternal and Child Health Act (1935) are relatively recent. They include the Neighborhood

Health Center (NHC) program (a 1965 Office of Economic Opportunity program) and Medicaid (a 1965 Title XIX program under the Social Security Act). Medicaid is by far the largest. It is primarily a financing program that is made available on the basis of low income; generally, eligibility for welfare also qualifies an individual for Medicaid, and in 28 states, this includes low-income families with two parents (AFDC-U). Seventeen states cover all children in families with incomes below AFDC eligibility, and there are medical "spend-down" provisions by which families that expend a certain amount of their incomes on medical care thereafter become eligible for Medicaid in 28 states.

But do these programs go far enough to create equal utilization? We will evaluate this question using data from an area that has extensive Medicaid coverage and a relatively well-developed Neighborhood Health Center system which is encouraged by a major university medical school. Thus our question really goes further. Given a situation where medical care programs are generously funded and readily available, do there remain differences in the utilization of medical care for children?

Clearly, the demand for medical care is tied to child health. Children who are well need less care than children who are ill; thus we will be careful to control for health status. Since medical problems are reported by the parents, however, bias may exist in that poorly educated parents may not recognize a medical problem, or may be less able to afford care for it, and therefore may not report it. We do not deal with this bias except by controlling for parent education.

The variables we emphasize are income, time constraints, availability and the role of insurance--particularly the differences between those with private insurance and those with Medicaid. All these are factors that enable a person to obtain medical care. Thus, the emphasis here is on "enabling" rather than on "need" or "taste" factors.

The underlying model is

$$U = \gamma X + \beta H + \gamma T + \varepsilon$$

where U = a vector of utilization variables,

X = a vector of enabling variables,

H = a vector of health or need variables,

T = a vector of taste or predisposing variables,

γ, β, γ = corresponding coefficients, and

ε = a vector of error terms.

There are several utilization variables; the first is whether or not a child received medical care in the past year. It is considered as recursive to the rest of the utilization measures, and is estimated in logit form using the entire sample. The next measure, which is made conditional on some visit or visits, is number of visits during the 12-month period. The remaining measures, percentages of visits to specific types of providers, cover visits to private practitioners, health centers or clinics, hospital out-patient clinics, hospital emergency rooms and school infirmaries. This approach allows us to separate visits which are parent-initiated from follow-up visits initiated by, or at least

reflecting, provider recommendations that may alter responses to the explanatory variables.

This emphasis on alternative providers is introduced because of the view that public policies may have led to dual-quality care, i.e., better care for those who have private insurance or who can afford to pay the asking price. Unfortunately, few attempts have been made to measure the quality of care in the most important sense--its effect on health status. We have generally adopted prevailing views about the quality of providers that emphasize factors such as continuity of care, experience and turnover. These imply that private practitioners will be ranked highest, emergency rooms lowest; clinics and health centers fall in between. School infirmaries are not included in the ranking, since services there are likely to be limited to screening programs, some of which may be required by law (e.g., hearing tests).

To get some sense of the patterns of utilization of private practitioners, and especially whether the patterns differ among neighborhoods, a regression was run using census tracts as the unit of observation and using certain census tract information (see U.S. Bureau of the Census, 1972). The percentage of children using private providers in each tract was made the dependent variable. The results below suggest that income, race and availability all make a difference.

Percentage whose regular provider is a private physician	= −.004% black (2.83)
	+ .06 median income (7.20)
	+ .06 GPs & pediatricians/1000 (2.17)
	+ .01 distance to clinic (2.24)
	+ .01 distance to hospital. (1.14)
	R^2 = .54 N = 155
	(t statistics are in parentheses.)

Regarding race, children living in areas with a high percentage of black persons are less likely than those in white neighborhoods to see a private provider; the maximum difference within Rochester neighborhoods is 38%.

Regarding income, children in areas with higher median incomes are more likely than those with low ones to see a private provider: the income range would imply a maximum difference of 101%.

Going from one extreme to the other in the availability of GPs and pediatricians, we see an increase of 36% in the probability of using a private provider; the range of clinic distances suggests an increase of up to 41% in the probability of using a private practitioner, if the nearest clinic is as far away as to take 41 minutes' travel time.

What all of this suggests is some rather systematic patterns of use in which those who should be considered "disadvantaged," in the sense that they live in poorer areas with fewer medical care providers, are

less likely than the advantaged to use private practitioners. Our micro-study below, controlling for need and for other enabling and predisposing factors, will further explore this pattern, but first the data base will be briefly described.

DESCRIPTION OF THE DATA AND THE LOCATION

The data used in this study came from the Rochester Community Child Health Survey, part of a long-term multidisciplinary research project which was begun in the mid-1960s in Rochester, Monroe County, New York, and was aimed toward gaining a better understanding of child health and community health services. A sequence of surveys was conducted between 1966 and 1975. The 1975 survey is the basis for the empirical work in this paper. The general plan for the 1975 survey was to obtain a 1% sample of families in Monroe County with children under 18 years of age and to interview or gather information on all children and adults in the families. The families were interviewed from March to December, 1975, and data were collected on 3116 individuals, of whom 1107 were children aged 1-11. Only 75% of these children are used in this analysis, since (1) only children living with their mothers are included and (2) individuals who reported days during the last two weeks when "they were not able to carry on as normal because of illness or injury" were not asked about illness or use of medical care during the preceding 12 months. Their data are not comparable during the preceding 12 months to those for

the rest of the sample, and therefore they are excluded. (See Wolfe, 1980, for a comparison of the samples.)

The 1974 population of the community was 706.9 thousand. In 1970, the population was 92% white; 9.1% of the total population was under 5 years of age; 19.8% was 5-14 years of age. The average per capita income was $3821, the average household income, $15,455; 16.9% of families and unrelated individuals had incomes under $3000 and another 8.3% incomes in the $3000-4999 range. In 1975, there were 31,288 on AFDC, or 41.3 per 1000.

Providers

There are seven acute-care hospitals in Monroe County, with an average bed ratio of 3.42 per 1000, which is below the nationwide average but probably well above the ratio needed. All hospitals have emergency rooms, three hospitals have full pediatric outpatient services, and there are seven neighborhood health centers and a number of well-child clinics. The physician/population ratio is 1.77/1000, which is above the national average. There is one medical school and a number of nursing schools in the county. Fewer than 10% of the physicians are in general practice; nearly 8% are pediatricians. The pediatricians are reportedly very busy, and there is a suggestion of maldistribution away from the inner city and outer suburban areas. In 1974, outpatient visits totaled 105,252 per 100,000 population, a 6% decrease in outpatient visits from 1973. There were a similar number of inpatient days per 100,000 population—102,995; this was a 1% decrease from 1973.

Nationwide, most people use private practitioners (in group or solo practice) as their regular medical care providers, and Rochester is no exception. Among children aged 1-11 in the sample, 79% use private practitioners. Nearly 10% use neighborhood health centers or other clinics, and approximately 2% use hospitals. The average income level is highest for those who use private practitioners--$18,176--and lowest for those using hospital-based facilities. Users of the neighborhood health centers have an average income of $9,858.

Those with Medicaid coverage follow the same sort of pattern—those with the lowest incomes use hospitals, the next group uses health centers or clinics, and the highest-income group uses private practitioners.

Insurance Coverage

Nationwide, we are not sure of the number of persons covered by insurance, though it has been estimated that 18 to 26 million persons do not have hospital insurance, the most common form of insurance. We do, however, have data on the expenditures covered by insurance and on the number of policies. In 1977, nearly 70% of the funds spent for personal health care involved a third-party payee (Gibson and Fisher, 1978), government programs accounted for 40% and private health insurance paid for nearly 27.6%. The percentages differed by type of expenditure and were highest for hospital care (94.1% of all hospital expenditures were covered by insurance, and 37% by private insurance).

Among the sample of children 1-11 (N = 810), 82.4% were covered under some form of private health insurance; 9.6% were covered by Medicaid;

nearly 6% were covered through an HMO-type arrangement, and 2.3% had no insurance coverage.

The average income of the families with different types of coverage followed the expected pattern: those with private insurance lived in families with the highest average family incomes--$17,802. Children covered under Medicaid lived in families with the lowest average income--$5,610. Those without coverage came from families with the next-lowest average income--$13,370; this can be thought of as the "squeezed" group. Those with HMO coverage fell in between, with an average family income of $15,054. The general pattern is similar for the adults in the sample.

All children in families eligible for AFDC--in New York State that includes families with unemployed fathers--were covered under Medicaid. Children in families with incomes above the AFDC level were eligible if their family income fell below this line after deducting medical expenses (under the "spend-down" provision). In-patient and out-patient hospital care, physicians' services, early and periodic screening, diagnosis and treatment including laboratory and X-ray tests were covered for children and individuals under 21.

In 1970, 55% of children in poverty under 21, nationwide, were Medicaid recipients. In New York State, the percentage was 168% of the children in poverty--the highest figure for any state, but this was down to 92.5% in 1974. Payment per child recipient in 1974 was $174 nationally, and $326 in New York (Davis and Schoen, 1978, p. 68). The ratio of payments in large urban counties (including Monroe) to New York City

was 84%. Children represented nearly 50% of the recipients, but received less than 20% of the funds.

As suggested earlier, insurance is viewed as an enabling factor; it reduces the price of care. But insurance coverage is itself voluntary. Presumably its purchase depends on expected medical care expenditures and price of insurance. Medicaid is somewhat different, in that coverage depends on meeting certain eligibility criteria.

We estimate the probability of insurance coverage and view it as recursive to the utilization results. In general, we expect higher income to be positively associated with private insurance purchase, and mother's working also to be associated positively, since it offers another chance to purchase group insurance; we also expect older--and larger--families to be more likely than younger and smaller ones to purchase insurance. Better education may also lead to more insurance purchases, perhaps reflecting a longer time horizon. Finally, we would expect both nonwhite race and receipt of welfare or child support to be negatively associated.

A number of the results are as expected in the private insurance equation reported in Table 1. These include income, welfare, race, mother's working, age and education. In fact, the only surprise is the sign of family size. Perhaps, however, this reflects the greater demand on resources made by larger families. The negative sign may suggest that income should be in equivalence terms. In any case the elasticity is small. In fact, the only elasticities above .05 are mother's education and family income.

Table 1

Logit Results: Probability of Having Different Types of Insurance

Variables	Private Insurance ($\bar{x}$ = .91; σ = .08) coef. asym. t	elasticity	HMO $\bar{x}$ = .07 σ^2 = .06 coef. asym. t	elasticity	Medicaid $\bar{x}$ = .06 σ^2 = .06 coef. asym. t	elasticity	Mean
Log family income	1.88 (4.91)*	.20	-.15 (0.34)	-.69			
Receive welfare on child support	-1.76 (4.38)*	-.01	-1.08 (1.62)	-.15	1.71 (2.99)*	.26	.15
Nonwhite	-.25 (0.49)	-.00	-.92 (1.53)	-.11	.40 (0.73)	.05	.12
M Full-time	2.70 (4.11)*	.01	.34 (0.79)	.07	-1.95 (2.87)*	-.41	.21
M Part-time	1.05 (1.69)	.004	.42 (1.01)	.08	-1.89 (2.07)*	-.37	.20
M OCC	.00 (.09)	.00	-.03 (1.37)	-1.52			49.3
F OCC	-.02 (1.19)	-.02	-.01 (0.67)	-.59			49.3
Not Married	-2.24 (2.11)*	-.01	-.03 (0.03)	-.00	1.91 (3.17)*	.23	.12
M Education	.24 (2.77)*	.06	-.11 (1.19)	-1.31			12.7
M Age	.06 (2.35)*	.04	-.06 (2.48)*	-2.07			35.8
N Siblings	-.21 (1.93)*	-.01	.18 (1.30)	.43	.43 (1.45)	1.08	2.54
Income spline (00's)							
Family income					-.03 (.58)	-4.83	168.6
(Income-pub. asst., 0)					.04 (.24)	4.69	
(Income-med. asst., 0)					-.05 (.43)	5.95	
Constant	-9.33 (3.41)		3.31 (1.52)		-1.93 (1.63)		
X^2	214		23		211		
N = 675							

Note: the unit of analysis is the household.
*Significant at the 5% level.

The HMO results are uninteresting. The only significant variable is mother's age, suggesting that older families are less likely to use HMOs. The number in the sample is small, and perhaps represents availability more than socioeconomic factors.

The Medicaid equation is of greater interest. Income is entered as a linear spline around eligibility.[1] The equation weakly suggests that those with the lowest incomes are most likely to have Medicaid coverage. Those with incomes between welfare and medical assistance show a flat relationship, while beyond the income levels that define eligibility, the probability may decline. Households that receive welfare or child support are more likely to have Medicaid coverage than those with working mothers (perhaps because of the greater availability to the latter of private insurance). Single-parent households are more likely to have Medicaid coverage than two-parent ones.

Thus it appears that income and price (as measured by working, and by eligibility factors) are important determinants. Expected use, as measured by the numbers likely to use care, is less important.

Neighborhood Health Centers

In 1976, there were approximately 125 health centers operating in the United States, serving some 1.5 million persons. Over a third of the patients were children. Persons below the poverty line were treated without cost, those above it paid.

In Rochester, a special clinic was set up in a hospital in 1964, but distance and difficulty of access--to reach it two bus changes were required--limited its success. There was little health care available in the neighborhood itself--only two family doctors for approximately 25,000 persons (Haggerty et al., 1975, p. 223). Now a neighborhood health center, set up in 1968, serves individuals in the seventh ward--a poor black ghetto. It has evening hours and a 24-hour on-call system. The NHC tries to attract recent graduates from the University of Rochester to its staff. In pediatrics and family medicine, it has been successful.

Although a number of studies (Davis and Schoen, 1978, pp. 180-85) have tried to show that the quality of these separate facilities is equal to that of other providers, one problem reducing quality is the high turnover of professional personnel. On other quality dimensions, the Rochester data used in this study suggest that physicians in health centers: (1) rank below physicians in private practice, though above those in hospital clinics, in terms of the ranking of medical schools attended; (2) are younger and less experienced than other practitioners; (3) are more likely to be board-certified but (4) are less likely to be specialists or affiliated with a hospital.

EMPIRICAL RESULTS ON UTILIZATION

We turn now to the subject of primary concern: utilization of medical care. We stress enabling variables and certain predisposing

factors. The variables included are: income, insurance coverage by type, race and median tract income, attitude towards reasonable costs and convenient hours, parent's time and number of children in household, availability measures, mother's education, whether the child has a regular M.D., parent's utilization, and routine checks. Need factors, such as various measures of health status, age, sex, and age of mother at birth, are controlled. Thus, if utilization were equalized by the existence of these programs, we would expect income, race and availability measures to be insignificant. The effects of family size and parent's time are less clear. Some parents may prefer larger families (quantity) while others prefer to invest more in each child (quality). (See Becker and Lewis, 1973.) If so, more children may be associated with lower utilization. Parents who work or are single parents have less time. A negative sign may indicate the more severe time constraint or lack of flexible provider hours. Alternatively, parents who have more time may substitute their own time for medical care. If this is so, the combined result may show no effect--but underlying differences may remain.

Mother's education may also follow a pattern likely to show insignificant results. Mothers with more education may be more efficient at producing any given level of health (a negative association), but may also demand more care or be better able to judge when to go to a provider. Thus an insignificant result here may still hide important differences.

We began our analyses of utilization by asking whether a child received medical care over the past 12 months. This question is separated from frequency to allow us to analyze visits which were patient-initiated--

or in the case of children, parent-initiated--from follow-up visits which may have been provider-initiated (Newhouse and Phelps, 1976, p. 275) or have reflected provider recommendations that could alter responses to the explanatory variables. Table 2 presents regression results on an equation run to "explain" whether or not a child saw a provider over a 12-month interval.[2]

Only a few of the factors of greatest interest (Panel 1) appear related to the probability that a child saw a provider. These include median income in the area of a child's residence, and family size. Family size has a negative association, perhaps because of additional financial or time constraints, or perhaps because parents eventually learn from experience how to manage children's health problems. The positive association with tract median income may be cause for greater concern: it may represent availability of medical care, discrimination by providers, or community norms; in its larger statistical associations it may better represent permanent family income, signifying a maintenance of income differentials in the use of medical care.

The need factors (Panel 2), where significant, indeed suggest that those with greater need, as measured by their health status, are more likely to receive care. Among predisposing factors (Panel 3), age follows the expected pattern--more care at youngest ages, then a leveling off. Greater parental use of medical care does not appear to be associated with greater probability of use by their children.[3] Thus there are differences in care related to constraints.

Table 2

Logit Results: Probability of Having Seen a Provider During Last 12 Months

Variables	Coef.	Asymptotic t	Elasticity	$\bar{x}$	σ
Enabling factors					
Family income (Y) in 000's	-.07	1.2	-.14	16.46	7.96
Max (Y - 1.5 Pov. Line, 0)	.05	0.8	.04		
Median income-Census tract	.09	1.9*	.14	13.28	3.26
Nonwhite (dummy variable)	-.04	0.1	.00	.15	.36
Insured (dummy variable)	-.00	0.0	-.00	.97	.15
Parent's time	-.00	0.1	-.00	112.13	23.84
N Siblings	-.28	2.9*	-.11	3.01	1.23
Drs./population	-.19	-1.4	-.00	.17	.66
Distance to clinic	.01	0.8	.02	11.59	9.03
Need Factors					
Ill	.61	2.2*	.02	.19	.39
Accident	.64	1.0	.00	.04	.19
Hospitalizations	1.47	1.7	.02	.09	.18
Predisposing factors					
Age	-.16	4.3*	-.14	6.73	2.93
Mother's education	.05	1.0	.07	12.54	2.66
Average parent's use	-.00	0.1	-.00	2.28	2.54
Reas. cost (dummy)	-.06	0.2	-.01	.71	.45
Conv. hours (dummy)	-.18	0.9	-.01	.59	.49
Constant	2.74	2.4			
χ^2	75.5				
N	810				

*Significant at the 5% level.

For those with any visits, we next analyze the total number of medical care visits (results are presented in Table 3). These provider visits appear to be only minimally affected by the factors of greatest interest--income, race, mother's education, income level of the community and, interestingly, insurance coverage. This suggests that among children aged 1-11, level of utilization is primarily explained by other factors, such as health and age.

Perhaps surprisingly, there appears to be no independent association between utilization of care and insurance of any type. This is confirmed in other model specifications in which "no insurance" is the included insurance variable, and in specifications interacting income and insurance. In a simple cross-tabulation, the number of visits appears somewhat associated with income; the greatest average number is for those with incomes 1.5 times the poverty line, the lowest for those 1 to 1.5 times poverty line, but the differences are small--2.4 compared to 2.7.

The findings on number of children suggest increased utilization until there are three children, and then less use. Again, this may indicate either economics of scale (gains in home production) or substitution of quantity for quality.

The finding on availability of doctors[4] suggests that greater availability is, to some extent, associated with greater utilization. It is not clear if this is because an existing demand can be met now, or whether it represents supplier-induced demand. The result does suggest some inequality.

Table 3

Medical Care Utilization Results[a]

Variables	Total No. Visits	Private Office Visit (%)	Health Center or Clinic (%)	Emergency Room (%)	Outpatient (%)	School (%)
Enabling variables						
Family Income (Y) in 000's Family Income (Y) in 000's	.03 (0.5)	-.03 (3.2)*	.02 (3.0)*	.002 (0.4)	-.01 (2.9)*	.02 (4.2)*
Max (Y-1.5 Pov. Line, 0)	-.01 (0.2)	.03 (3.2)*	-.02 (2.8)*	-.003 (0.5)	.01 (2.9)*	-.02 (4.4)*
Median income-census tract	-.00 (0.7)	.02 (3.3)*	-.02 (4.2)*	-.003 (2.4)*	.003 (1.2)	.001 (0.4)
Nonwhite (dummy variable)	.04 (0.7)	-.32 (6.8)*	.32 (8.2)*	-.02 (0.9)	.01 (0.1)	.01 (0.4)
Insurance dummies						
Private	.20 (0.6)	.14 (2.3)*	-.11 (2.2)*	.04 (1.1)	-.02 (0.7)	-.04 (1.5)
Medicaid	.08 (0.2)	-.25 (3.0)*	.17 (2.4)*	.04 (0.8)	.07 (1.5)	-.02 (0.6)
HMO	-.18 (0.4)	-.10 (1.5)	.20 (3.7)*	-.09 (2.4)*	.003 (0.1)	-.01 (0.4)
Reas. Cost (dummy)	-.30 (0.7)	-.19 (2.7)*	.14 (2.5)*	.05 (1.4)	-.03 (0.8)	.02 (0.4)
RC x Priv. or no insurance	-.09 (0.2)	.15 (2.0)*	-.13 (2.0)*	-.05 (1.2)	.04 (1.0)	-.01 (0.4)
Convenient hours	.28 (1.9)	.02 (0.9)	.01 (0.3)	-.01 (0.6)	-.03 (2.0)*	.004 (0.4)
Parent's time	-.00 (1.2)	.001 (2.5)*	-.001 (1.3)	.00 (0.0)	-.0001 (0.4)	-.001 (2.6)*
N children	.50 (1.7)	.05 (1.0)	-.02 (0.6)	-.01 (0.3)	.05 (1.9)*	-.06 (2.7)*
(N children)^2	-.08 (1.8)	-.01 (1.1)	.003 (0.4)	.002 (0.6)	-.004 (1.1)	.01 (2.2)*
Availability						
Drs./population	.18 (1.6)	.01 (0.6)	-.01 (0.8)	.01 (1.2)	-.01 (0.9)	-.002 (0.2)
Distance to clinic	.00 (0.1)					
Distance to HMO		.00 (1.4)	-.001 (0.6)	-.002 (2.1)*	-.001 (1.4)	.002 (2.2)*
Distance to hospital		-.00 (0.1)	.00 (0.1)	.0004 (0.3)	.001 (0.9)	-.001 (1.3)
Predisposing						
Routine check	-.28 (1.2)	.06 (1.6)	-.003 (0.1)	-.08 (3.4)*	-.01 (0.3)	.02 (1.2)
Mother's education	-.01 (0.3)	.01 (1.5)	.001 (0.2)	-.001 (0.4)	-.005 (1.6)	-.003 (1.2)
Aver. parent's visit	.04 (1.5)	-.02 (3.3)*	.01 (1.3)	.01 (2.8)*	-.002 (0.8)	.005 (2.0)*
No regular M.D.	-.27 (0.4)	-.18 (1.7)	-.21 (2.4)*	.57 (9.6)*	-.09 (1.7)	-.89 (1.8)
R^2	.33	.50	.43	.29	.15	.11
N	682	682	682	682	682	682

Note: t-statistics in parentheses.

[a]Equation also includes need variables, a constant and certain additional predisposing variables; see Appendix for these results.

[b]Means for the dependent variables in order are: 2.64; .74; .13; .06; .04; .03.

*Significant at the 5% level.

In general, there is little cause for alarm in these findings. The findings on use or nonuse provide more cause for concern, and appear to reflect mainly differences in income level and family size.

PATTERNS OF UTILIZATION

There are five types of provider used by children in the sample: private practitioners, health centers or clinics,[5] hospital outpatient clinics, emergency rooms and school infirmaries. The last accounts for a very small percentage. As suggested earlier, by traditional standards private practitioners are rated highest in terms of quality, emergency rooms lowest (except for accidents). (The difficulty with health centers and clinics is primarily lack of continuity and, possibly, less experienced doctors.)

In the analysis, the percentage of total annual visits using each type of provider is related to the probability of using each particular type of practice. Since the independent variables are the same in each equation, the system is estimated using single-equation OLS. (This gives the same results as estimating the system as a whole. The coefficients, added across, sum to zero, except for the constant and rounding errors.) Most visits--74%--are to private providers; 13% of visits are to health centers or clinics; 6% are to emergency rooms, 4% to outpatient clinics and nearly 3% to school infirmaries.

Insurance Coverage

Children whose parents have private insurance appear more likely to be taken to private practitioners and less likely to use health centers or clinics than those without. This may reflect personal choice for private practitioners. The lower probability of using health centers or clinics may reflect special payment features of these practices.

Children covered under Medicaid are most likely to use health centers or clinics, least likely to use private practitioners, and somewhat more likely to use hospital outpatient clinics than non-Medicaid children. Those covered through an HMO-type arrangement are most likely to use such centers, least likely to use emergency rooms or private practitioners.

There is nearly a 40% difference in the probability that children in families with private insurance and those with Medicaid will use private practitioners. Since we noted clear associations between income and the probability of private insurance, this differential pattern suggests continued inequality in medical care utilization.

Income

Although the income findings are significant, they are small, and cancel out at 1.5 times the poverty line. They do indicate that among the lowest-income groups, controlling for insurance, race, median tract income, availability, need and other factors, there is

a high probability that those with the lowest income (up to 1.5 times the poverty line) will see private practitioners, or use outpatient clinics or schools. The findings for median-tract income--which might be considered a measure of permanent income--suggest that children in higher-income families are likely to use private practitioners. These children are less likely to use health centers or clinics or emergency rooms. This suggests that income has not been "neutralized" through public programs, but that families who live in higher-income areas take their children to private practitioners. Alternatively this pattern may reflect provider location or neighborhood norms.[6] Any one of these might be reason for our wishing to reappraise both the provision of care, and public policies in this area.

Race

White children are more likely than nonwhite ones to use private practitioners; nonwhite children are likely to use health centers or clinics. And this difference remains after controlling for insurance, including Medicaid, income, tract income, family size, need and other predisposing factors. In fact, the largest single coefficients are for race (-.32 for private office visits). This is a significant difference, and is confirmed by cross-tabulation results: 85% of whites with incomes above 1.5 times the poverty line use private practitioners, but only 32% of nonwhites in this income category do so; 33% of whites with incomes below the poverty line use private practitioners, but only 8% of nonwhites

with similarly low incomes do so. All of these results give reason to believe that utilization patterns remain unequal.

Parent's Time

Two-parent households and those with a nonworking parent generally have more time available to spend with their children than do single and working parents. Does this affect utilization? There is some evidence here that it does: children of parents with "more time" available are somewhat more likely to see a private practitioner. The effect is small: a 40-hour increment of available time would be associated with a .04 increase in the probability of seeing a private provider. Having a parent who did not work might add another .04 or .08 increase.

Families with more children have greater demands than those with fewer on their resources of both time and money. The results suggest little effect on patterns of utilization: there is some increase in the probability that they will use hospital outpatient facilities, and they are somewhat less likely to use school infirmaries.

Availability and Attitudes Toward Cost

A priori, we expected availability to influence utilization. Our results do not substantiate this. One explanation is that we are dealing with one county only, whereas availability appropriately applies to a broad geographical area (though quality is not necessarily homogeneous) and physicians are about equally accessible throughout the area. Another

is that the doctor/population ratio, though limited to pediatricians and general practitioners, includes doctors at health centers, clinics and hospitals. These latter tend to be in the poorer areas, though they provide care to a broad population group and so may overstate physician/population ratio in these areas. Thus, the ratio of private practitioners to population might be a better measure than the one used here.

Distance shows in general little effect: However, there is a very small increase in the probability that school facilities will be used if the mileage to an HMO is further. There is also a very slight (and inexplicable) negative relationship for emergency rooms. The coefficients are small: 20 additional miles reduces the probability of using an emergency room by .04 or 4%.

Certain families respond that reasonable cost is an important consideration in selecting medical care. Does this influence their behavior? First of all, such individuals are more likely than those who do not worry about cost to take their children to a health center or clinic and less likely to take them to a private practitioner. The coefficients are quite large, confirming that cost is an important determining factor for them.

This cost variable is made to interact with one designed to measure whether the family pays first-dollar costs. The proxy for this second variable is lack of HMO or Medicaid coverage; that is, the family has no insurance or has private insurance. These families who care about cost and do not have first-dollar coverage appear to have less response

in terms of their children's utilization patterns: a small reduction (-.04) in the probability of using private practitioners compared to families with similar insurance but without such concerns and no effect on the use of health centers or clinics. This suggests that this combination of characteristics has its major impact on type of coverage--a theory to be explored in the future.

Certain families place value on convenient hours in selecting a provider. The only influence of this variable on patterns of utilization in this study is slightly to decrease their probability of using hospital outpatient clinics--a response that may reflect either the clinics' hours of operation or the waiting time in such clinics.

Mother's Education

There is some indication that mothers with more education are more likely than less educated ones to take their children to private practitioners and less likely to take them to hospital outpatient clinics (although the results are not significant). This would be consistent with a perception that private practice offers better care.

SUMMARY AND CONCLUSIONS

Children who may be considered disadvantaged--those in lower-income areas who are nonwhite and whose parents have less time available--tend to use private practitioners far less than do whites from higher-income areas. Coverage by Medicaid further reduces the probability of using private practitioners. These parents may choose to use alternative

care; or the results may reflect the location of private practitioners away from nonwhite or low-income areas, and financial limitations in Medicaid which discourage private practitioners from taking Medicaid patients. Whatever the cause, these findings suggest that public policies have not been entirely successful in equalizing medical care utilization by children.

The provision of financial resources through the Medicaid system and the availability of alternative types of care have not achieved an equal level or quality of medical care utilization among children in the Rochester area. This is so even though the community has extensive benefits and a large program committed to pediatrics, and is probably a community in which greater efforts have been made to equalize care than many others.

In terms of the probability of a visit or number of visits, much equality has been achieved. But children whose families live in areas (as defined by census tracts) which have higher incomes are more likely to get medical care, and children with more siblings are less likely to be taken to the doctor. Both of these are cause for concern. Race and family income do not appear to generate significant differences in the amount of utilization among users, a finding which reaffirms that equality in certain dimensions has been achieved.

Sharper differences are suggested when we examine patterns of utilization, however. White children in high-income areas from families with a parent at home and with private insurance are more likely than

other children to see a private practitioner. (This result is somewhat similar to that in Davis and Reynolds, 1976, where blacks were found to use less ambulatory care than whites.) If continuity and/or experience of practitioners are used as indicators of quality, this pattern suggests that high-income white children get higher quality care than low-income black and other disadvantaged children. This result may stem from Medicaid's payment system, the availability of providers, or other forms of discrimination.

Removing financial constraints is only one part of providing access to care: location of care, ease and cost of transportation, hours of practice, and information about when to go and about quality of care are not included in the current policy package. Yet they are important in determining patterns of use and affect utilization patterns.

Appendix Table

Further Utilization Results:
Independent Variables Not Shown in Table 3

Variables	Total Visits	Private Office Visit (%)	Health Center or Clinic (%)	Emergency Room (%)	Outpatient (%)	School (%)
Need Variables						
Ill	.40 (2.8)	-.01 (0.3)	.03 (1.4)	-.04 (2.5)*	.03 (1.7)	-.01 (0.7)
Accident	- .10 (0.3)	-.13 (2.1)*	-.09 (1.7)	.28 (8.0)*	-.03 (1.0)	-.03 (1.2)
Hospitalizations	1.24 (3.3)*	.04 (0.6)	-.05 (0.9)	-.05 (1.4)	.04 (1.1)	.02 (0.8)
Days Ill	.09 (13.9)*	-.001 (1.3)	.001 (1.3)	-.00 (0.5)	.001 (1.6)	-.00 (0.6)
Predisposing Variables						
Age	- .56 (5.2)*	.02 (1.0)	.002 (0.1)	-.005 (0.5)	-.01 (1.1)	-.005 (0.6)
Age^2	.03 (3.9)*	-.002 (1.3)	-.00 (0.1)	.00 (0.5)	.001 (0.8)	.001 (1.4)
Female	.05 (0.3)	.01 (0.6)	.002 (0.1)	-.04 (2.7)*	.01 (0.6)	.01 (1.2)
Low Mother's Age	-.08 (0.3)	-.06 (1.2)	-.06 (1.5)	.04 (1.4)	.11 (4.3)*	-.03 (1.2)
Unhappy Family	-.38 (1.5)	-.04 (0.9)	.08 (2.4)*	.01 (0.5)	-.01 (0.6)	-.04 (2.2)*
Children Share Provider	.30 (1.3)	.05 (1.4)	.02 (0.5)	-.03 (1.5)	-.02 (0.9)	-.02 (12)
Constant	3.26	.32	.23	.19	.17	.09

Note: t-statistics in parentheses.

*Significant at the 5% level.

GLOSSARY

Letters in parentheses following standard deviations are keys to sample size.

Enabling variables:

Family Income: Total annual family income; $\bar{x}$ = \$16,860, σ = \$7,810 (A), $\bar{x}$ = \$16,460, σ = \$7,960 (B).

Max (Income-1.5 Poverty Line, 0): Linear spline with corner at family income minus 1.5 times the matched poverty line (by size and headship).

Max (Income-Pub. Asst., 0): Linear spline with corner at family income minus the public assistance income limit, matched by family size.

Max (Income-Med. Asst., 0): Linear spline with corner at family income minus the medical assistance income limit, matched by family size.

Log Family Income: Log of total annual family income; $\bar{x}$ = 5.00, σ = .57 (A).

Receive Welfare or Child Support: Dummy variable, 1 = family received welfare or child support, 0 = no such income; $\bar{x}$ = .15, σ = .36 (A).

Median Income - Census Tract: Median 1969 family income for the family's census tract; $\bar{x}$ = \$13,280, σ = \$3,260 (B).

Nonwhite: Dummy variable, 1 = nonwhite, 0 = white; $\bar{x}$ = .12, σ = .33 (A), $\bar{x}$ = .15, σ = .36 (B).

Private insurance: Dummy variable, 1 = family coverage through Blue Cross, Blue Shield or other private plans, 0 = no family coverage through those plans; $\bar{x}$ = .91, σ = .29 (A). $\bar{x}$ = .89, σ = .32 (C).

Medicaid: Dummy variable, 1 = family coverage through Medicaid or public welwelfare, 0 = no such coverage, $\bar{x}$ = .06, σ = .24 (A), $\bar{x}$ = .09, σ = .29 (C).

HMO: Dummy variable, 1 = family coverage through an HMO, 0 = no such coverage; $\bar{x}$ = .07, σ = .25 (A), $\bar{x}$ = .06, σ = .24 (C).

Insured: Dummy variable, 1 = family coverage through private insurance, Medicaid or welfare, or an HMO, 0 = no family coverage. $\bar{x}$ = .98, σ = .15 (B).

Reas. Cost: Dummy variable, 1 = reasonable fees rated "very important" in choice of provider, 0 = any other rating; $\bar{x}$ = .71, σ = .45 (B).

Reas. Cost x Priv. or No Insurance: Interaction of Reas. Cost and a dummy variable for which 1 = private insurance or no insurance, 0 = Medicaid or HMO coverage.

Conv. Hours: Dummy variable, 1 = convenient hours rated "very important" in choice of provider, 0 = any other rating; $\bar{x} = .59$, $\sigma = .49$ (B).

Parent's Time: For each parent present, 84 hours less 40 if parent works full time, or less 20 if parent works part time, is in school, etc. $\bar{x} = 112.13$, $\sigma = 23.84$ (B).

M full-time: Dummy variable, 1 = mother works full time, 0 = mother does not work full time; $x = .21$, $\sigma = .41$ (A).

M part-time: Dummy variable, 1 = mother works part time, 0 = mother does not work part time; $x = .20$, $\sigma = 1.23$ (B).

N children: number of children under 18 in the family; $\bar{x} = 2.84$, $\sigma = 1.14$ (C).

Not married: Dummy variable, 1 = not currently married (only mother present), 0 = both parents present; $\bar{x} = .12$, $\sigma = .33$ (A).

Availability Variables:

Drs./Population: Number of G.P.s and pediatricians per pop. in family's neighborhood, $\bar{x} = .17$, $\sigma = .66$ (B).

Distance to clinic: Driving time in minutes between the family's neighborhood and that of the nearest clinic; $\bar{x} = 11.59$, $\sigma = 9.03$ (B).

Distance to HMO: Driving time in minutes between the family's neighborhood and that of the nearest HMO; $\bar{x} = 11.87$, $\sigma = 8.67$ (C).

Distance to Hospital: Driving time in minutes between the family's neighborhood and that of the nearest hospital; $\bar{x} = 11.65$, $\sigma = 6.12$ (C).

Need Variables

Ill: Dummy variable, 1 = child has or has had serious or chronic illness; 0 = no such illness, $\bar{x} = .19$, $\sigma = .39$ (B).

Accident: Dummy variable, 1 = child's last illness caused by an accident; 0 = last illness not accident related; $\bar{x} = .04$, $\sigma = .35$ (B).

Hospitalizations: Number of hospitalizations before the 12-month study period; $\bar{x} = .09$, $\sigma = .18$ (B).

Days Ill: Number of days child was ill in previous 12 months; $\bar{x} = 6.34$, $\sigma = 11.30$ (C).

Predisposing Variables:

Age: Age of child; $\bar{x} = 6.93$, $\sigma = 2.93$ (B).

Female: Dummy variable, 1 = female, 0 = male; $\bar{x} = .49$, $\sigma = .50$ (C).

M age: Mother's age; $\bar{x} = 35.79$, $\sigma = 8.12$ (A).

Low Mother's Age: Dummy variable, 1 = mother's age-child's age < 20, 0 = mother's age-child's age $\geq$ 20; $\bar{x} = .06$, $\sigma = .24$ (C).

Mother's education: Years of school completed; $\bar{x} = 12.65$, $\sigma = 2.57$ (A), $\bar{x} = 12.54$, $\sigma = 2.66$ (B).

M Occ: Ratings of mother's occupation based on Bogue Index; high values = high prestige occupation; $\bar{x} = 49.29$, $\sigma = 7.65$ (A)

F Occ: Rating of father's occupation; $\bar{x} = 49.20$, $\sigma = 21.49$ (A).

Average Parent's Use: Average number of physicians visits of parents in last 12 months; $\bar{x} = 2.28$, $\sigma = 2.54$ (B).

Routine check: Dummy variable, 1 = at least one family member's last physician visit was for a routine check; $\bar{x} = .89$, $\sigma = .31$ (C).

No regular M.D.: Dummy variable, 1 = child has no regular provider, 0 = child has one or more regular providers; $\bar{x} = .15$, $\sigma = .12$ (C).

Unhappy family = Dummy variable based on a composite of three family and marital happiness variables; 1 = respondent answered negatively on at least one variable; $\bar{x} = .09$, $\sigma = .29$ (C).

Children Share Provider: Dummy variable, 1 = all children under 17 have same provider (including cases of one-child families); 0 = children go to different providers; $x = .87$, $\sigma = .34$ (C).

Keys to samples for which means and standard deviations are given:

A: N = 675 (one observation per family).

B: N = 810 (all children, ages 1-11).

C: N = 682 (all children with at least one provider visit in the previous 12 months).

Notes

[1]See Menchik, 1977, for eligibility criteria in New York.

[2]Logit analysis is used since the dependent variable only takes on one of two values--one if the child saw a physician, zero otherwise. While this maximum likelihood formulation is desired in such cases, since it constrains the probability to be between zero and one, there are certain disadvantages, including, in general, a greater restriction on the number of variables included.

[3]This variable may represent attitudes or physician-induced demand.

[4]Distance and weighting of availability by neighborhood proximity was done using proximity information from Roghman and Zastowny, 1979, and provider location and specialty information from the 1976 U.S. Physician's References history.

[5]Data-collection procedures unfortunately limit our ability to differentiate between neighborhood health centers and HMO-type clinics.

[6]The doctor/population ratio measures all GPs and pediatricians in an area. This includes those practicing in health centers and clinics.

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