Insurance, Income, and Access to Ambulatory Care in King County, Washington

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ABSTRACT

Objectives. We studied simultaneous effects of income and insurance on access measures in an indigent population, focusing on Medicaid and the marginal effects of increasing income.

Methods. Surveys were distributed in waiting rooms of county clinics and welfare offices. Models examined insurance (private, Medicaid, or none), income (to twice the poverty level), single-parent status, age, gender, and presence of a regular source of care; first-order interactions were evaluated.

Results. In terms of ease of access, postponing care, and having a regular source of care, uninsured respondents fared worst and Medicaid recipients were at an intermediate level. However, relative to those with private insurance, Medicaid recipients had four times the odds, and uninsured respondents twice the odds of being denied care. Income had no consistent effect; however, older, poorer people may have greater problems. For preventive services, income was significant, while differences between Medicaid and private insurance were generally not significant.

Conclusions. Except for denial of care, access for indigent people is improved by Medicaid but remains worse than the access of those with private insurance. Income had variable effects, but support for income criteria used for public insurance eligibility was not found. (*Am J Public Health.* 1993;83:1583–1588)

Introduction

Access to medical care for indigent populations remains a problem in the United States. Income and insurance are two factors widely regarded as being important for access. However, little evidence exists indicating whether income in the range used in determining Medicaid eligibility has a meaningful impact on access. Enacted to provide health insurance coverage to the indigent, Medicaid currently covers less than 50% of those below the federal poverty level, a proportion that has been declining since 1975.[1] Furthermore, states set benefits and eligibility levels; thus, in 1988, the maximum family income for Medicaid eligibility through Aid to Families with Dependent Children ranged from 14.6% of the federal poverty level in Alabama to 85.8% in Utah.[2]

Medical insurance, especially Medicaid, does not guarantee adequate access. Medicaid has been reported to eliminate the lower rate of physician visits experienced by indigent populations; however, there is debate as to whether this holds after adjustment for health status.[3–10] A study of Medicaid expansion for obstetrical care in Tennessee did not indicate improvements in obtaining timely prenatal care or in birth outcome,[11] although termination of Medicaid benefits has been shown to result in worse access and outcomes.[12] Medicaid recipients and uninsured persons have been found to have increased rates of avoidable hospitalization.[13,14]

Income has been reported to be an important determinant of access,[4,5,14–21] but many studies have not controlled for its association with insurance status. People at upper income levels, whether insured or not, probably experience fewer barriers to care than do people at lower levels, and their inclusion in comparisons may produce effects not present in lower income groups. One study of insured adults found that income was correlated with access, but the study included too few poor persons to analyze whether this effect was attributable to income or Medicaid.[16] In women 45 to 64 years of age, lack of insurance coverage was the strongest predictor of receiving preventive services, while income was generally not a significant predictor.[22] In a clinic population, a study limited to persons with incomes up to twice the federal poverty level found insurance to be highly significant and income not significant for having a regular source of care and having at least one physician visit in the previous year.[23] In a national survey, Medicaid was a fairly important factor for predicting better access for children under 5 years of age, while income had a modest and not always significant effect.[24]

Having a regular source of care can be considered both a predictor and a measure of access.[5,8,16,18,25] Being able to identify a specific care provider has been reported to be a crucial factor in improved access.[6,14,15] In a recent study, income was not significant in predicting having a regular source of care; however, poor individuals were much more likely to lack a regular source of care for financial reasons. Those who were insured were twice as likely as those who were uninsured to have a regular source of care.[26]

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This paper was accepted March 23, 1993.

Inadequate access may also result in deferral and denial of care. Six percent of the US population has been estimated to have needed but not received care[18,19]; estimates vary (e.g., 0.4%,[27] 1.5% [3.2% for low-income persons],[28] and 2%[15]) as to the percentage of people who have been denied care as a result of lacking money or insurance. Those with public insurance have reported the same[19] or a higher[15] frequency of being denied care as have those who are uninsured.

Between 1980 and 1990, the population of King County, Washington, increased approximately 25%, with greater growth occurring outside of Seattle and in the low income population. According to the 1990 census, the incomes of 15.6% of the county population are below 200% of the federal poverty level, and the incomes of 4.2% are below the federal poverty level. These are probably conservative estimates given the groups that tend to be underrepresented in the census. Approximately 3.4% of county residents and 2.2% of those residing outside of Seattle are Medicaid recipients. Approximately two thirds of the county's population lives outside of Seattle.

As the population increased, concern developed that access problems were increasing among poor residents, especially in areas outside of Seattle, and that county facilities were becoming overburdened. As part of a process for creating a master plan for county health services, the Seattle–King County Department of Public Health decided to survey access problems of current and potential users of its health care services.

We hypothesized that, in this relatively indigent population, insurance status would strongly predict access and income would not predict access; also, we hypothesized that Medicaid recipients would be at a level of access intermediate between privately insured and uninsured persons. Furthermore, we believed that single parenthood, in addition to its association with Medicaid eligibility, might serve as an indicator of greater socioeconomic difficulties.

Methods

Data Source

The survey instrument was developed by the health department and pilot tested with a focus group of 15 people chosen to be similar to the population expected to be present in the survey locations. Surveys were available in English, Spanish, Vietnamese, and Cambodian. They were collected anonymously in the waiting rooms of county clinics and welfare offices during spring through fall 1989 (south and east King County) and in fall 1990 (southwest King County). All persons present were asked to participate, and the surveyor was available to provide any needed assistance. Refusal rates were 5% to 10% on any given day.

Respondents were asked to estimate their monthly household income. Insurance status was ascertained by asking for all methods of paying medical bills; possible responses were self-pay, medical coupons (Medicaid), private insurance, unable to pay, and other.

Respondents were asked to rate, on a five-point Likert scale (ranging from "very easy" to "very hard"), how difficult it was for them to obtain checkups, illness care, mental health counseling, dental care, and affordable prescription drugs. Also, they were asked where they usually sought health care; choices included no regular source of care, health department clinics, community clinics, private doctors or clinics, emergency rooms, and other. Finally, they were asked whether, in the last 2 years, they (1) had put off seeking care because of lack of money or insurance, (2) had been denied care, and (3) had received the following preventive services: checkups, blood pressure checks, breast exams, and pelvic exams or Papanicolaou smears.

Analysis

Insurance status was classified as uninsured, Medicaid, privately insured, and both Medicaid and private insurance. The number of persons in the last category was too small to produce reliable estimates; thus, results for this group are not presented. Persons with only "other" coverage (e.g., Veterans Administration care) were also excluded.

Income was converted to a percentage of the federal poverty level for the year of the survey; categories were poor (<100% of the federal poverty level), near poor (100% through 149% of the federal poverty level), and other low income (150% to 200% of the federal poverty level). Expression of income as a continuous fraction of the federal poverty level did not significantly alter results of any of the analyses.

Respondents who reported not having a place they usually went to receive care or using a hospital emergency room were considered not to have a regular source of ambulatory care.

The Likert-scaled items were used as dependent variables in linear regressions performed with SPSS 4.0 (SPSS Inc., Chicago, Ill). In univariate analyses of these variables, linearity tests were used for income and age and F tests were used for differences of means for the other variables. Logistic regressions for categorical variables were performed with EGRET (Statistics and Epidemiology Research Corp., Seattle, Wash). Univariate significance for categorical outcomes was assessed with chi-square tests, and trend tests were used for income and age. All first-order interaction terms were evaluated; interactions are reported if they were either significant at $P < .01$ or significant for more than one of the measures at $P < .05$.

Results

Respondent Characteristics

A total of 2508 surveys were available for analysis. To remove Medicare as a possible confounder, persons 65 years of age or older (11) were excluded. Respondents who did not report income (152) or family size (546), did not report insurance status or reported only "other" (28), or indicated a family income greater than 200% of the federal poverty level (147) were not included in subsequent analyses. Respondents who reported incomes greater than 200% of the federal poverty level were excluded because some respondents clearly reported annual instead of monthly income. After these exclusions, 1624 surveys (64.8%) remained for analysis.

Respondents were predominantly female, poor, and Medicaid recipients (see Table 1). The mean age was 30 for women and 34 for men. The mean income was 84% of the federal poverty level for women and 81% for men; the median income was 76% of the federal poverty level. Half had Medicaid and 28% were uninsured. Only 0.5% of respondents lived alone, and children were present in 97.5% of all households. Those excluded by the above criteria were more likely to be male (25%), not to be single parents (71%), and to have either private insurance (35%) or no insurance (38%).

Analysis

The relative contributions of the different predictors were examined with linear regression models for the measures of perceived ease of access (Table 2), and with logistic regression models for the other, dichotomous outcome measures (Tables 3 and 4). Unadjusted data are discussed only when results of the regression

TABLE 1—Demographic Characteristics of Respondents

	No.	%
Insurance		
Private insurance	313	19
Medicaid	809	50
Medicaid and private insurance	47	.3
Uninsured	455	28
Income		
Other low income (150%–200% of federal poverty level)	144	9
Near poor (100%–149% of federal poverty level)	323	20
Poor (<100% of federal poverty level)	1157	71
Single parent		
No	802	50
Yes	802	50
Sex		
Female	1472	91
Male	151	9
Age, y		
12–20	125	8
21–30	672	41
31–40	672	41
41–50	136	8
51–65	19	1

TABLE 2—Linear Regression Coefficients for Perceived Ease of Access after Other Factors are Controlled for

	Check-ups	Illness Care	Mental Health Care	Dental Care	Affordable Prescription Drugs
Constant	0.96*	0.98*	1.96	1.88	2.60*
Insurance					
Medicaid	.37**	0.23***	0.53†	0.46†	0.25
None	.77*	0.84*	0.82*	1.16*	0.99*
Income					
Near poor	0.17	0.15	−0.16	0.25	0.14
Poor	0.05	0.28	−0.18	0.29	−0.89
No regular source of care	0.74*	0.79*	0.65*	0.55*	0.55*
Single parent	−0.25***	0.62***	−0.14	−0.10	−0.11
Male	0.08	−0.06	−0.06	−0.12	−0.20
Age (y/10)	0.23*	0.21*	0.20**	0.15**	−0.12
Single parent × no regular source of care	0.39†	...	...	...	...
Single parent × income interaction††					
Single parent × near-poor	...	−0.33	...	...	...
Single parent × poor	...	−0.79***	...	...	...
Age × income interaction†††					
Age × near-poor	...	...	...	...	0.09
Age × poor	...	...	...	...	0.40***
R^2	0.19	0.20	0.10	0.12	0.13

Note. Omitted (reference) category is private insurance for insurance and other low income for income. *$P < .0001$; **$P < .01$; ***$P < .05$; †$P < .001$ (t test for hypothesis $\beta = 0$); ††$P = .005$ by F test with 2 degrees of freedom for single parent × income category; †††$P = .01$ by F test with 2 degrees of freedom for age × income catetory.

TABLE 3—Odds Ratios for Access Barriers after Other Factors are Controlled for: Logistic Regression Models

	Odds Ratio (95% Confidence Interval)		
	No Regular Source of Care	Deferred Care (No $ or Insurance) Last 2 y	Denied Care, Last 2 y
Insurance			
Medicaid	1.9 (1.2, 2.8)	1.2 (0.8, 1.6)	3.9 (2.4, 6.3)
Uninsured	4.1 (2.8, 6.1)	2.7 (1.9, 3.8)	2.2 (1.3, 3.5)
Income			
Near poor	1.0 (.06, 1.6)	0.2 (0.03, 1.6)	0.03 (0.002, 0.4)
Poor	1.4 (.09, 2.2)	0.1 (0.01, 0.5)	0.08 (0.007, 0.8)
No regular source of care	...	1.9 (1.5, 2.5)	1.5 (1.2, 2.0)
Single parent	1.0 (0.8, 1.4)	0.9 (0.7, 1.1)	1.0 (0.8, 1.4)
Male	2.2 (1.5, 3.3)	0.6 (0.4, 0.9)	0.6 (0.4, 0.9)
Age (y/10)	...	0.7 (0.5, 1.2)	0.5 (0.2, 1.0)
Age > 40	0.5 (0.3, 0.9)	...	...
Age > 40 × single parent	4.3 (1.9, 9.6)	...	...
Age × income interaction			
Age × near-poor	...	1.5 (0.8, 2.7)*	3.1 (1.3, 7.3)**
Age × poor	...	2.1 (1.2, 3.5)	2.6 (1.2, 5.7)

Note. Omitted (reference) category is private insurance for insurance and other low income for income. *$P = .01$ and **$P = .02$ by likelihood ratio statistic with 2 degrees of freedom for age × income category interaction.

analyses differ notably from unadjusted results or when they convey significant additional information.

For perceived ease of access, average scores indicated check-ups (2.39) and illness care (2.35) were easiest to obtain, prescription drugs (2.84) were somewhat harder to obtain, and mental helath (2.97) and dental care (3.14) were the hardest to obtain, reaching averages of neutral to slightly difficult. Lacking a regular source of care was reported by 16% of those with private insurance, compared with 31% of Medicaid recipients and 48% of the uninsured. Putting off care was common for all respondents, but more common for the uninsured (81%) than others (58%). Receipt of the different preventive services ranged from 60 to 75% of respondents overall.

For all of the perceived ease of access measures and the access barriers (deferring care, being denied care, and having no regular source of care), insurance status was the strongest predictor; for receipt of preventive services, insurance status was significant but was not the most important factor. In general, uninsured respondents had the worst access, and Medicaid recipients were at an intermediate level of access and often significantly different from both of the other groups. For example, being uninsured shifted responses for perceived difficulty approximately one point on the five-point scale; Medicaid status shifted responses one-fourth to one-half point.

A striking exception to this trend is

TABLE 4—Odds Ratios for Receipt of Preventive Services in the Previous 2 Years after Other Factors are Controlled for: Logistic Regression Models

	Odds Ratio (95% Confidence Interval)			
	Checkup	Blood Pressure Check	Breast Exam	Pelvic Exam or Papanicolau Smear
Insurance				
Medicaid	0.6 (0.4, 0.9)	0.8 (0.6, 1.2)	0.8 (0.6, 1.2)	0.8 (0.5, 1.3)
Uninsured	0.6 (0.4, 0.8)	0.6 (0.4, 0.9)	0.6 (0.4, 0.9)	0.6 (0.4, 0.9)
Income				
Near poor	4.1 (0.4, 38)	0.5 (0.3, 0.8)	0.5 (0.3, 0.8)	0.4 (0.2, 0.8)
Poor	7.7 (1.0, 61)	0.5 (0.3, 0.8)	0.5 (0.3, 0.7)	0.4 (0.2, 0.7)
No regular source of care	0.5 (0.4, 0.6)	0.6 (0.4, 0.7)	0.6 (0.5, 0.8)	0.7 (0.5, 0.9)
Single parent	1.2 (0.9, 1.6)	1.0 (0.8, 1.3)	1.1 (0.9, 1.4)	1.0 (0.7, 1.3)
Male	0.6 (0.4, 0.9)	0.8 (0.5, 1.1)	...	...
Age (y/10)	2.0 (1.0, 3.8)	0.8 (0.7, 0.9)	0.8 (0.7, 0.9)	0.8 (0.6, 0.9)
Age × income interaction*				
Age × near poor	0.5 (0.2, 1.0)	...	...	...
Age × poor	0.4 (0.2, 0.8)	...	...	...

Note. Omitted (reference) category is private insurance for insurance and other low income for income.
*$P = .02$ by likelihood ratio (2 *df*).

that Medicaid recipients were most likely to report denial of care (OR = 3.9) while uninsured respondents were at an intermediate level (OR = 2.2) (Table 3). These odds ratios were only slightly decreased by adjustment, and it should be noted that even 10% of privately insured respondents reported denial of care.

Even before adjustment, income was significant only for some of the measures of perceived ease of access and barriers to access. In instances in which it was significant, lower income persons fared worse. After adjustment, some of these trends disappeared, and in the other cases significant interactions were found (Tables 2 and 3). In contrast, income remained strongly associated with receipt of preventive services after adjustment, with the poor and near poor having only about half the odds of the highest income group of receiving these services (Table 4).

Five significant income interactions were found, four of which were age–income interactions Tables 2–4). Their interpretation was not completely consistent but suggests, overall, that older, poorer respondents had poorer access. The fifth interaction, between income and single-parent status, involved receipt of illness care. Single parents had a trend for decreasing perceived difficulty with decreasing income, an effect opposite that observed before adjustment, while others had a smaller trend for increasing difficulty with decreasing income (Table 2).

After adjustment, having a regular source of care remained a strong predictor of improved access on all of the measures. For ease of obtaining checkups, there was a significant interaction between having a regular source of care and single-parent status. Not having a regular source of care increased the difficulty by more than a full category for single parents and by about two thirds of a category for those who were not single parents (Table 2).

Single-parent status was significant only in interactions. In addition to the two interactions discussed above, single-parent status interacted with age for having a regular source of care. Single-parent status had no discernible effect for respondents up to age 40; however, for respondents more than 40 years of age, single parents had four times the odds of those who were not single parents of lacking a regular source of care (Table 3).

Gender had no discernible effect on perceived ease of access after adjustment (Table 2); before adjustment, men reported significantly increased difficulty in obtaining checkups and illness care. Men were twice as likely as women to lack a regular source of care but half as likely to report deferral or denial of care (Table 3). Men were also less likely to have had a checkup, and they showed a trend in this direction for blood pressure checks (Table 4) that had been significant before adjustment.

Increasing age generally correlated with greater perceived difficulty (Table 2) and decreased odds of having received preventive services (Table 4).

Respondents from county clinics and welfare offices reported similar access problems. In instances in which they differed, those from welfare offices were more likely to report denial of care (OR = 1.5) and less likely to have received a breast examination (OR = 0.8). Respondents from welfare offices who had the lowest incomes were more likely than others to report putting off care; those with the highest incomes were less likely to defer care. Respondents from welfare offices who did not have a regular source of care reported slightly more difficult access to checkups and illness care than did those from county clinics (data not shown).

Discussion

In our population, insurance status predicted the greatest differences for perceived ease of access and barriers to access, and even many privately insured respondents reported access difficulties. For receipt of preventive services, insurance was one of several important predictors. Generally, Medicaid was associated with access measures that were at an intermediate level between private insurance and lack of insurance coverage. The finding that Medicaid recipients were even more likely to experience denial of care than were uninsured respondents was unanticipated and troubling. The reasons for this finding are unclear but may be related to recipients being unaware of which providers accept Medicaid and, perhaps, the greater likelihood of uninsured persons to defer care. Given such findings, the suggestion that access problems of poor uninsured persons can or should be addressed by Medicaid expansion appears unrealistic.

Associations involving income were less clear cut than those involving insurance. In general, adjustment for other factors eliminated the effects of income on perceived ease of access and barriers to care, but an income–age interaction was significant for three of the measures. These interactions suggest that older (over 30), poorer people in our population have more difficulty obtaining access to care, consistent with results from a study of preventive services in women that did not control for insurance.[29] Increasing income increased the odds of receiving blood pressure checks, breast exams, and pelvic exams or Papanicolaou smears. It is not clear why, contrary to the results of Woolhandler and Himmelstein,[22] income had

little predictive value for ease of access and access barriers but was a strong and fairly consistent predictor for receipt of preventive services. Conceivably, our findings could have resulted from the frequent exclusion of preventive services from insurance coverage and their perception as "optional" services. These observations need to be clarified in future investigations, but their equivocal nature does not provide support for arbitrary income cutoffs less than twice the poverty level for Medicaid or other publicly supported health insurance.

Reporting a regular source of care was strongly associated with improved access on all measures. Consistent with previous findings, income was not an important predictor, and insurance was the most important predictor, of having a regular source of care.[26] Causality should not be inferred from such associations since, for example, those having a regular source of care may be persons who are more likely to seek care. This could explain why men were less likely to report a regular source of care but also less likely to report postponing and being denied care. Assigning persons without a regular source to providers may or may not improve access for those who have not found a source on their own.

Single-parent status showed no consistent effect. For many people, Medicaid eligibility is dependent on eligibility for Aid to Families with Dependent Children and, hence, single-parent status; however, such a criterion does not appear to be sensible from the perspective of access.

A number of weaknesses of the study should be considered. First, the respondents represent a use cohort, and responses are subject to a volunteer bias. However, representative samples of indigent people are difficult to obtain. Telephone samples underrepresent indigent persons,[18,30] which, although having little effect on population estimates, may seriously bias studies of the poor. Second, the number of persons in the highest income group in this study was relatively small, decreasing the power to detect effects of income. Third, more than 20% of the responses were excluded as a result of missing information concerning family size, and those respondents who were excluded may have been different from other respondents (e.g., mostly persons living alone). Fourth, because of the sampling strategy, men were underrepresented in the sample. Fifth, the questions used to elicit information about receipt of preventive services may have resulted in significant overestimates, since some respondents may have considered an illness-related visit to be a checkup and women receiving a pelvic exam may have mistakenly assumed that a Papanicolaou smear was performed or may have been unaware of the distinction between the two procedures. Finally, a number of the measures depend on actual or perceived need for services, but the survey instrument contained no information to assess health status and perceptions.

However, given that surveys were distributed in county clinics and welfare offices, there are probably needier and more disenfranchised populations not represented by this survey. Also, given the fluctuations in insurance status that occur with time,[31] the associations with insurance status we found are probably subject to a conservative bias.

It should be noted that the proportion of variance explained by the models for perceived ease of access was modest (in the range of 10% to 20%) (Table 2) and consistent with previous results.[15] There was also a large amount of unexplained variation for the categorical access measures. Clearly, many other factors are important in gaining access to health care. Insurance is, however, probably the most easily altered factor, and the results of this study suggest that public insurance by no means solves the access problems it was meant to address.

In summary, in this relatively indigent population, we found uninsured persons to have the worst access, Medicaid recipients to be at an intermediate level of access, and people with private insurance to have the best access. Of particular concern is the finding that Medicaid recipients were even more likely than uninsured respondents to report being denied care. Controlling for insurance generally attenuated the effect of income, except for preventive services. Interactions suggested that poorer respondents more than 30 years of age may have more access difficulties than others after insurance status is controlled for. □

Acknowledgments

This work was performed while Barry G. Saver was a National Research Service Award Fellow (Bureau of Health Professions, grant 5 T32 PE10001) in the Department of Family Medicine at the University of Washington.

An earlier version of this article was presented at the 13th annual meeting of the Society of General Internal Medicine, May 1990, Crystal City, Va.

We wish to thank Rita Altamore, MD, MPH, and David Nowels, MD, for their helpful comments on earlier versions of the manuscript. Also, we gratefully acknowledge the provision of data on Medicaid recipients in King County by John Yoachim of the Washington State Department of Social and Health Services.

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