

The Demand for Ambulatory Mental Health Services from Specialty Providers

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A two-part model is used to examine the demand for ambulatory mental health services in the specialty sector. In the first equation, the probability of having a mental health visit is estimated. In the second part of the model, variations in levels of use expressed in terms of visits and expenditures are examined in turn, with each of these equations conditional on positive utilization of mental health services. In the second part of the model, users are additionally grouped into those with and without out-of-pocket payment for services. This specification accounts for special characteristics regarding the utilization of ambulatory mental health services: (1) a large part of the population does not use these services; (2) of those who use services, the distribution of use is highly skewed; and (3) a large number of users have zero out-of-pocket expenditures. Cost-sharing does indeed matter in the demand for ambulatory mental health services from specialty providers; however, the decision to use mental health services is affected by the level of cost-sharing to a lesser degree than is the decision regarding the level of use of services. The results also show that price is only one of several important factors in determining the demand for services. The lack of significance of family income and of being female is notable. Evidence is presented for the existence of bandwagon effects. The importance of Medicaid in the probability of use equations is noted.

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Although extensive work has been done in recent years in the general area of demand for health services, research into demand behavior for mental health services is less well developed. The purpose of this article is to examine the demand for ambulatory mental health services from specialty providers.

An understanding of the forces affecting the demand for ambulatory mental health services is significant for public and private policy-making that deals with third-party payment for mental health services. Much debate surrounds the issue of the appropriate level of insurance coverage for psychiatric services. With respect to the private sector, there is a trend toward decreasing mental health benefits under private health insurance (Sharfstein and Taube, 1982 [1]). However, legislative initiatives have been providing a countering trend (State Health Reports, 1983 [2]) with implications for changing the delivery of mental health services with respect both to who will receive services and who will provide them. State freedom of choice laws requiring equivalent treatment of psychologists and psychiatrists under insurance benefits would foster competition between physician and non-physician providers of services. State-mandated coverage of mental health benefits under private insurance plans could potentially increase demand and cost for mental health services.

This article addresses the issue of price responsiveness. The analysis involves estimation of demand equations for the annual consumption by individuals of ambulatory mental health services from specialty providers. The model which is employed concentrates on explaining demand as a function of income, money prices, mental health status, and individual tastes. The role played by cost-sharing is explicitly incorporated in the model through the specifications which are used for the money price and insurance variables.

The analysis is possible because of the availability of a national database on medical care utilization and expenditures which, because it is household based, contains information on nonusers of services, thus allowing an analysis of the decision to use services. The sample size is also sufficient to allow a separate analysis of the level of use of mental health services in the specialty sector.

DATA DESCRIPTION

THE DATA

The National Medical Care Expenditure Survey (NMCES), a sample survey of the civilian, noninstitutionalized population of the United

States, is the data source for this analysis, providing detailed information on expenditures for and use of health services, as well as health insurance coverage, for calendar year 1977. NMCES was funded by the National Center for Health Services Research, which cosponsored the survey with the National Center for Health Statistics.

NMCES consists of several interlinked survey components, three of which were used for this analysis:

1. The Household Interview Survey (HIS), which collected information from 14,000 randomly selected households, each interviewed six times over a 15-month period during 1977 and 1978
2. The Medical Provider Survey (MPS), which obtained information from physicians and health care facilities regarding health services provided to a sample of persons in these households
3. The Health Insurance/Employer Survey (HIES), which collected data from employers and insurance carriers of individuals and families in the household survey concerning their health insurance coverage.

The Household Interview Survey was the source of most of the data for this analysis, including the household respondent's report of a mental health visit as well as standard demographic and socioeconomic data. Detailed information was also collected on all medical events occurring in 1977, including visits to ambulatory medical providers. Information was obtained on reason for the visit as well as charges for the visit and the amount paid by the family and/or other sources of payment. For a description of the household survey, see Bonham and Corder [3]. For a detailed description of the sampling design for the household survey, see Cohen and Kalsbeek [4].

The Medical Provider Survey was used only to edit or supplement the household data. In the Health Insurance/Employer Survey, detailed information on insurance benefits was abstracted from insurance policies. Benefits for psychiatric care were specifically examined, and it is these data which form the basis for the insurance variables used in this analysis. For a detailed discussion of the HIES, see Cohen and Farley [5].

For this analysis, use of ambulatory providers is defined as ambulatory visits to psychiatrists, psychologists, psychiatric social workers, and mental health counselors. Visits to emergency rooms and telephone contacts are not included.

DESCRIPTIVE BACKGROUND

Detailed descriptive data on utilization and expenditure patterns for ambulatory mental health services based on the NMCES have been described elsewhere (Horgan [6, 7]). In 1977, almost 5 percent of the U.S. population had at least one ambulatory visit in conjunction with a mental problem. Three-fifths of these users received their care in the general medical sector and the remainder, representing just under 2 percent of the population, used services from specialty mental health providers. Among the almost 4 million persons using specialty services, the mean number of visits was 9.6. The distribution of these visits was highly skewed, with approximately one-half of users having four or fewer visits.

The family paid a greater proportion of expenditures for these services than other payers with about 46 percent of expenditures classified as out-of-pocket. Private insurance was the next most important payer, accounting for about one-quarter of expenditures. A substantial percentage of expenditures was accounted for by the other category (18 percent), indicating the importance of care which may be described as care provided in subsidized settings such as community mental health centers. Medicaid accounts for about 12 percent of expenditures. The contribution from Medicare is negligible. Of persons who used ambulatory mental health services from specialty providers, a substantial proportion—about 36 percent—did not have any out-of-pocket expenses.

METHODS

Specification of a demand model for ambulatory mental health services must take into account two special characteristics of utilization of ambulatory mental health services. First, a very large part of the population does not use services. Second, of those who do use services, the distribution of use of these services is highly skewed. To accommodate these characteristics, a two-part model—a common approach to the demand for medical services [8, 9]—is proposed. The first equation estimates the probability of having a mental health visit, that is, the decision to seek care. In the second part of the model, variations in levels of use expressed in terms of visits and expenditures are examined in turn, with each of these equations conditional on positive utilization of mental health services.

In the second part of the model, users are additionally grouped into those with and without out-of-pocket payments for services. This dichotomy is made because there is reason to suspect that individuals who receive free care do not follow the typical patterns of demand due to peculiarities surrounding the provision of their care. This separates out primarily individuals on Medicaid and users of the subsidized services of community mental health centers.¹

The first part of the model examines whether or not an individual used any ambulatory mental health services during the year, and thus reflects the decision to enter the medical system for treatment of a mental condition. Examining the probability of an ambulatory mental health visit as a separate equation resolves the problem of dealing with a large number of zero observations, that is, individuals with no use. Logistic regression is the technique used to estimate the probability of using ambulatory mental health services.²

In the second part of the model, a linear function estimated by weighted least-squares regression is used to estimate both the annual number of visits and the annual expenditures for ambulatory mental health services from specialty providers conditional on positive utilization. Because the distribution of use and expenditures for these services is highly skewed, a logarithmic transformation is employed to remove the skewness. The dependent variable and all continuous independent variables are entered in logarithmic form.

The dependent and independent variables employed in estimating these equations in this model are described below. For summary statistics on these variables, see the appendix.

DEPENDENT VARIABLES

In the equations examining the probability of using ambulatory mental health services (Table 1), the dependent variable is dichotomous, taking on a value of 1 if a person had a visit for ambulatory mental health services to a specialty provider and a value of 0 if a person did not have such a visit. In the equations examining levels of use in terms of quantity of visits (Table 2), the dependent variable is continuous and represents the logarithm of the annual number of ambulatory mental health visits in the specialty sector. The dependent variable in the equations examining levels of use in terms of expenditures (Table 3) is the logarithm of the sum of prices for all visits in the specialty mental health sector.

INDEPENDENT VARIABLES: PRICE/INSURANCE

Specification of the correct price variable for medical care is not straightforward because of insurance coverage which reduces out-of-pocket costs. Theory suggests that the proper price variable is the gross price of care adjusted for insurance coverage and other sources of payment. Various measures have been used in demand studies to represent money price, e.g., average out-of-pocket price or average coinsurance rate in the state. These measures are in fact misspecified and cause a variety of econometric problems [10]. The correct price specification is the price paid for a marginal unit of care net of insurance benefits. Although theoretically correct, it is in fact not usually feasible to measure empirically the true marginal price if a deductible is present in an insurance policy. A measurement problem arises because the true price below the deductible is less than the observed price: use below the deductible raises the likelihood of exceeding the deductible [11]. A similar argument can be made with respect to upper limits, which are usually regarded as empirically unimportant because of the low probability of a user of services actually reaching the limit. This may, however, be an issue with respect to psychiatric services where lower limits may apply.

Another problem with specification of the proper price variable is that insurance may be endogenous. This is because of the "adverse selection" associated with insurance coverage; that is, individuals who are more likely to use mental health services may also be more likely to purchase better insurance coverage for these services. While "adverse selection" certainly is a concern, it may not be a large enough problem to bias these results seriously. A separate analysis of the same database used for this study shows that in 1977 only 20 percent of subscribers actually had a choice of insurance plans through their employers [12].

The NMCES database for this analysis is sufficiently detailed so that several ways of computing the price variable are possible. The equations presented in Tables 1-3 employ several different price specifications.

In the probability of use equations, specifications based on what the insurance policy details as psychiatric coverage are employed. The term "insurance policy" is used in a broad sense, and what might be described as public insurance policies, i.e., Medicaid and Medicare, are included in addition to private policies. Specification of a price/insurance variable for nonusers as well as users of service is possible if the insurance policy is used, because insurance information is available for both users and nonusers of services.

Various price specifications using observed out-of-pocket payments are employed in the equations examining levels of use for those who have out-of-pocket expenses.³ For users who do not have out-of-pocket expenses, a dummy variable reflecting whether the individual was covered by Medicaid at any point during the year is included. This variable reflects whether individuals who receive free care because they are on Medicaid behave differently than individuals who receive other free care, possibly because they may not be subject to the same kind of non-price rationing.

OTHER INDEPENDENT VARIABLES

Other independent variables which are included in the regression equations are classified into groups representing demographic, health, and community characteristics. The standard sociodemographic-economic variables thought to influence utilization are included. Sex, race, and marital status are included as dummy variables. Family size refers to the number of individuals in the family unit. Education is measured by the number of years of schooling completed by the head of household. Both age and age-squared measured in years are included in the probability of use equations in order to capture the expected inverted U-shaped utilization pattern of mental health services according to age. In the level of use equations, age is entered in dummy form because the logarithm of age and age-squared is perfectly collinear. Family income is included, as well as a variable reflecting labor force participation.

Formal measures of mental health status are not available; however, several proxy measures are explored. It is expected that people who perceive their health status as low may also perceive that their mental health status is low; thus, a dummy variable reflecting self-perceived health status is included. Also, it is hypothesized that individuals with low mental health status will have a higher number of disability days, defined as the unduplicated sum of days in bed, days lost from work, and days on which normal activities were curtailed. Another dummy variable is included with the intent of indicating the severity of the mental condition by classifying into seven categories the condition which occasioned a mental health visit. If a person had visits which could have placed him or her into more than one category, the individual was assigned to the most severe category reported. For example, if a person reported having three visits for counseling and one visit for a neurosis, then this individual was assigned to the neurosis category.

Others' demand for mental health services may increase an individual's own demand for services. This is known as the bandwagon effect, and its influence on mental health services has been discussed in McGuire [13]. Two variables intended to capture these area demand effects are included. A dummy variable measuring whether a person's state of residence has mandated—or mandated availability of—private insurance coverage for mental health services is intended to reflect community support for mental health services or an atmosphere favorable to seeking care. Whether the state in which an individual resides has a freedom of choice law with respect to equivalent coverage for psychiatrists and psychologists is also entered in dummy form.

Several other variables reflecting community characteristics are included. A dummy variable for region of the country is included, as well as a dummy variable for place of residence which is intended to reflect degree of urbanization. Three variables from the Area Resource File are used in some of the regressions, also to reflect community characteristics. They are: county median years of schooling, county per capita income, and county psychiatrist-population ratio.

FINDINGS

PROBABILITY OF USE

Two equations showing alternative insurance specifications for the probability of having an ambulatory mental health visit from a specialty provider are presented in Table 1.⁴ A continuous variable reflecting the coinsurance rate for psychiatric services once the deductible has been met is included in LOGIT I.⁵ This variable ranges in value from 0 to 1; thus, a person with a coinsurance of .2 must pay 20 percent of the bill out-of-pocket. This measure of coverage may obscure the effects of particular insurance characteristics, so in LOGIT II a series of dummy variables is used. In effect, hypothetical insurance plans are constructed, which range from full coverage to no coverage and take into account the existence of a deductible as well as levels of coinsurance.

Both equations, as discussed below, reveal a significant but small negative relationship between cost-sharing and whether or not an individual has a specialty-sector mental health visit. Because cost-sharing affects the demand for mental health services, estimates of the responsiveness of demand to cost-sharing, i.e., price elasticity of demand, are presented.

The psychiatric coinsurance rate is significant and negative as

Table 1: Ambulatory Mental Health Services in the Specialty Sector — LOGIT Equations for Probability of Using Services

<i>Variable Definition</i>	<i>Variable Name</i>	LOGIT I	<i>Marginal Effect</i>	LOGIT II	<i>Marginal Effect</i>
<i>Insurance</i>					
Psychiatric coinsurance rate	POPPCON	-0.5817c** (4.40)††	-0.0110	—	—
Full coverage	COV2*	—	—	0.6813c (6.05)	0.0130
No deductible/coinsurance < .5	COV3*	—	—	0.5198c (2.65)	0.0098
No deductible/coinsurance ≥ .5	COV4*	—	—	-0.2463 (0.97)	-0.0047
Deductible/coinsurance ≤ .2	COV5*	—	—	0.2873b (2.22)	0.0053
Deductible/coinsurance .21-.49	COV6*	—	—	-0.0129 (0.07)	-0.0003
Deductible/coinsurance ≥ .5	COV7*	—	—	-0.0606 (0.50)	-0.0012
<i>Demographic</i>					
Sex (1 = male)	SEX	0.0244 (0.24)	0.0005	0.0318 (0.46)	0.0060
Race (1 = white)	WGTRACE	0.9967c (5.78)	0.0190	1.0589c (8.80)	0.0202c
Age	AGE	0.1742c (9.10)	0.0033	-0.1736c (10.81)	-0.0033
Age-squared	AGESQ	-0.0023c (10.27)	-0.0001	-0.0023c (11.41)	-0.0000
Family income (\$000)	INCOME	-0.0049 (1.48)	-0.0001	-0.0043a (1.74)	-0.0000

Continued

Table 1: Continued

<i>Variable Definition</i>	<i>Variable Name</i>	LOGIT I	<i>Marginal Effect</i>	LOGIT II	<i>Marginal Effect</i>
Years of education of family head	HEADEDUC	0.0441 ^c (2.86)	0.0008	0.0533 ^c (4.88)	0.0011
Employment status (1 = not in labor force)	NOWORKER	0.3050 ^c (2.67)	0.0058	0.2491 ^c (2.96)	0.0048
Family size	FAMSIZE	-0.0992 ^c (3.07)	-0.0018	-0.1020 ^c (4.12)	0.0019
Marital status—under 18 years	YOUNG†	1.5672 ^c (6.03)	0.0299	1.5147 ^c (7.58)	0.0289
Single	SINGLE†	0.6050 ^c (3.90)	0.0116	0.5598 ^c (4.54)	0.0107
Widowed	WIDOWED†	0.4429 ^a (1.73)	0.0085	0.3811 ^b (2.01)	0.0073
Divorced or separated	DIVORCED†	0.4517 ^c (2.61)	0.0086	0.3827 ^c (2.83)	0.0073
Marital status unknown	UNMAR	-1.5062 (1.49)	-0.0287	-0.8466 ^a (1.75)	0.0161
<i>Health</i>					
Perceived health status good or excellent	GOODHEAL†	-0.8751 ^c (6.95)	-0.0167	-0.8432 ^c (8.72)	-0.0161
Perceived health status unknown	UNKHEAL†	-0.7381 ^c (2.44)	-0.0141	-0.7062 ^c (3.42)	0.0135
Number of disability days	DISDAYS	0.0050 ^c (5.65)	0.0001	0.0050 ^c (6.12)	0.0001
<i>Community</i>					
SMSA—not 16 largest	OTHSMSA\$	-0.1536 (1.21)	-0.0029	-0.1471 ^a (1.73)	-0.0028
Not in SMSA	NONSMSA\$	-0.4497 ^c (2.55)	-0.0086	-0.4433 ^c (3.48)	-0.0085

County per capita money income 1974 (\$000)	CNTY66	0.0000 (0.35)	0.0005	0.0000 (0.72)	0.0007
Mandated mental health benefits	BENMAN¶	0.3350 ^b (2.06)	0.0064	0.3362 ^c (2.69)	0.0064
Mandated availability of mental health benefits	BENAVAIL¶	-0.0252 (0.14)	-0.0004	-0.0417 (0.33)	-0.0003
Freedom of choice law (1 = yes)	FOC	0.2614 (0.19)	0.0004	-0.0012 (0.01)	0.0000
Northcentral census division	CENTRAL¶	0.1380 (0.97)	0.0026	-0.0898 (0.92)	0.0017
Northern census division	EAST¶	0.1244 (0.77)	0.0023	0.0558 (0.48)	0.0011
Western census division	WEST¶	0.2004 (1.19)	0.0038	0.1671 (1.44)	0.0031
Psychiatrists per 1,000 county population	PSYPOP	0.7641 ^c (3.44)	0.0146	0.7074 ^c (3.51)	0.0135
Constant	CONSTANT	-7.2370 (11.50)	0.1387	-7.8428 (17.24)	-0.1499
<i>Statistics</i>					
Log of likelihood function		-2,028.97		2,041.31	

*No-insurance omitted.

†Married omitted.

‡Perceived health status fair or poor omitted.

§SMSA - 16 largest omitted.

¶No mandates for mental health coverage omitted.

‡Southern census region omitted.

**Levels of significance are a = .10, b = .05 and c = .01.

††-Statistics are in parentheses.

indicated in LOGIT I; however, the magnitude of the response is small. An increase in the coinsurance rate from 0 percent to 100 percent decreases the probability of using services by 1.1 percentage points.⁶ The elasticity⁷ for the psychiatric coinsurance rate is -0.27 .⁸ This means that a 10 percent increase in the coinsurance rate is associated with a 2.7 percent decrease in the probability of using specialty ambulatory mental services.

Hypothetical insurance groups were constructed from deductible and coinsurance rate information and entered as dummy variables in LOGIT II. The reference group is no coverage for psychiatric visits. The three insurance groups which correspond to (1) full coverage; (2) no deductible, low coinsurance rate; and (3) deductible, low coinsurance rate—that is, the groups which require the least amount of cost-sharing—showed a significantly positive relationship with the probability of using services. Going from no coverage to full coverage increases the likelihood of a visit by 1.3 percentage points and going from no coverage to a deductible with low coinsurance increases the probability by .5 percentage points. Thus, although statistically significant, the magnitude of the response is small.⁹

In both of the equations discussed above, the remaining independent variables exhibited the same pattern. Neither sex nor family income were significant predictors of the probability of using ambulatory mental health services in the specialty sector at the .05 level. Whites were more likely to use services than nonwhites. The probability of use increases with increasing education of the head of the household. All of these findings are consistent with Wells et al. [14].

The age and age-squared specification confirms a statistically significant inverted U-shaped pattern associated with the use of these services, which peaks at approximately 38 years of age. Not being in the labor force shows a significantly positive relationship with the probability of using these services. To the extent that poorer mental health status is correlated with inability to participate in the labor force, this result is expected. All other marital groupings were more likely to use mental health services than the married. Family size showed a significantly negative relationship with likelihood of use.

Those in self-reported good or excellent health were less likely to use services than those in poor or fair health. Number of disability days shows a positive association with the likelihood of use.

The degree of urbanization also is positively associated with likelihood of use. Regional differences are not pronounced.

Residing in a state that has mandated the provision of mental health benefits under private insurance is associated with the likelihood

of using services compared to a state with no mandates. Merely mandating that such coverage be offered as an optional rider does not appear to increase significantly the probability of using mental health services. Whether a state had a freedom of choice law with respect to equivalent coverage for psychiatrists and psychologists was not a significant predictor of use. Finally, the psychiatrist-population ratio at the county level exhibits a significant positive relationship with the probability of using services, which may be measuring the better availability of mental health services.

NUMBER OF VISITS

The dependent variable in the three equations presented in Table 2 is the logarithm of annual number of visits conditional on having a visit for specialty ambulatory mental health services. PAY I and PAY II regressions are for individuals with some out-of-pocket expenses. The FREE I regression is for persons who did not have any out-of-pocket expense, that is, those who received free care.

Regressions PAY I and PAY II differ only in the specification for the price variables. In PAY I the log of the average percent paid out-of-pocket per visit is entered, and in PAY II the log of the average amount paid out-of-pocket per visit, i.e., the net price, is used. Both of these price variables are negative, as expected, and significant. The elasticity is somewhat higher with the percent out-of-pocket specification (-.44) than with the amount out-of-pocket specification (-.30).¹⁰ McGuire's study [13] of the use of private practice psychiatrist services also found significantly positive price elasticities with respect to number of visits.

The FREE I regression is estimated without the price variables since these individuals have zero values for both the percent paid out-of-pocket and the net price. Whether or not someone is covered by Medicaid is entered to control for an important source of payment for some individuals who receive care which involves no out-of-pocket expense. Being on Medicaid is significantly and positively associated with number of visits; thus, those who do not have out-of-pocket expenses because they are on Medicaid have a higher level of use in terms of number of visits than those who receive free care with non-Medicaid sources paying for their care. A possible explanation for this finding is that with non-Medicaid free care there may be more non-price rationing, such as longer time to get an appointment and more stringent limits on the number of visits.

As in the probability of use equations, neither sex nor income are significant predictors of quantity of services. The Wells et al. study

Table 2: Ambulatory Mental Health Services in the Specialty Sector—Weighted OLS Equations for the Logarithm of the Number of Visits for Users with (PAY) and without (FREE) Out-of-Pocket Expenses

<i>Variable Description</i>	<i>Variable Name</i>	PAY I	PAY II	FREE I
<i>Price/Insurance</i>				
Log of the average percent paid out-of-pocket per visit	LAVFPCT1	-0.436c** (5.22)††	—	—
Log of the average amount paid out-of-pocket per visit	LAVFAMT1	—	-0.296c (5.55)	—
Any Medicaid coverage (1 = yes)	MEDICAID	—	—	0.332b (1.93)
<i>Demographic</i>				
Sex (1 = male)	SEX	0.072 (0.61)	0.118 (1.00)	-0.115 (0.78)
Race (1 = white)	WGTRACE	0.446 (1.58)	0.550a (1.96)	0.018 (0.08)
0-18 years	CHILD*	0.006 (0.03)	-0.055 (0.30)	-0.170 (0.83)
19-34 years	YADULT*	-0.011 (0.07)	-0.099 (0.64)	-0.395b (2.20)
50-64 years	OADULT*	-0.317 (1.62)	-0.253 (1.31)	0.003 (0.02)
> 65 years	SENIOR*	-1.067c (3.31)	-1.230c (3.84)	-0.190 (0.42)
Log of family income	LINCOME	0.012 (1.29)	0.002a (1.67)	-0.042 (0.52)
Log of years of education of family head	LHEADEDU	0.160 (1.29)	0.207a (1.67)	-0.049 (0.38)
Employment status (1 = not in labor force)	NOWORKER	-0.194 (1.51)	-0.164 (1.28)	-0.133 (0.83)
Log of family size	LFAMSIZE	-0.401c (3.49)	-0.414c (3.62)	-0.176 (1.21)
<i>Health</i>				
Perceived health status good or excellent	GOODHEAL†	0.087 (0.51)	0.135 (0.79)	0.178 (1.08)
Perceived health status unknown	UNKHEAL†	0.012 (0.03)	0.192 (0.46)	-0.260 (0.43)
Log of disability days	LDISDAYS	-0.009 (0.46)	-0.005 (0.25)	-0.007 (0.74)

Continued

Table 2: Continued

<i>Variable Description</i>	<i>Variable Name</i>	PAY I	PAY II	FREE I
Psychosis	PSYCHOS†	0.516 (1.37)	0.602 (1.61)	0.261 (0.59)
Other mental disorder	OTHMDIS†	0.328 (1.51)	0.333 (1.54)	-0.021 (0.08)
Neurosis	NEUROS‡	0.465 ^b (2.33)	0.426 ^b (2.14)	-0.356 (1.51)
No condition— counseling	COUNSEL‡	0.092 (0.50)	0.076 (0.42)	-0.730 ^c (3.09)
No condition—no reason for visit	MHPROV‡	-0.205 (0.97)	-0.244 (1.16)	-1.292 ^c (5.78)
<i>Community</i>				
SMSA—not 16 largest	OTHSMSA§	-0.386 ^c (2.91)	-0.374 ^c (2.85)	-0.043 (0.26)
Not in SMSA	NONSMSA§	-0.558 ^c (2.97)	-0.558 ^c (2.99)	-0.200 (0.86)
Mandated mental health coverage (1 = yes)	MANDATES	0.053 (0.32)	0.173 (1.05)	-0.370 ^b (1.97)
Freedom of choice law (1 = yes)	FOC	-0.023 (0.14)	-0.007 (0.04)	0.323 ^a (1.65)
Northcentral census division	CENTRAL¶	-0.047 (0.26)	-0.086 (0.48)	-0.334 (1.56)
Northern census division	EAST¶	-0.189 (1.00)	-0.186 (0.99)	-0.187 (0.78)
Western census division	WEST¶	0.042 (0.22)	-0.196 (1.03)	0.025 (0.10)
Log of county median years of schooling	LYRSCHOO	0.285 (0.25)	0.547 (0.49)	-0.222 (0.20)
Log of psychiatrists per 1,000 county population	LPSYPOP	0.020 (0.71)	0.032 (1.16)	0.048 ^a (1.85)
<i>Intercept</i>	INTERCEPT	2.569 (0.89)	0.740 (0.26)	3.631 (1.25)
<i>Statistics</i>				
R-squared		.273	.280	.319
F ratio		4.68	4.84	3.92
Degrees of freedom		349	349	234

*Years 35-49 omitted.

†Perceived health status fair or poor omitted.

‡Nervousness or depression category omitted.

§SMSA—16 largest omitted.

¶Southern census region omitted.

**Levels of significance are a = .10, b = .05 and c = .01.

††t-Statistics are in parentheses.

[14] found insignificant income effects in their level of use equations as well, although McGuire [13] found a significantly positive relationship.

Being white is not a significant predictor of number of visits in the FREE regression, although it is significant in the PAY II regression. It appears that if no cost-sharing is involved, nonwhites use services at the same level as do whites. Education of family head is positively related to level of use in the PAY regressions, although it is significant only with the PAY II specification. Whether or not one is in the labor force is not a significant predictor of number of visits.

A different age pattern appears between those who have out-of-pocket expenses and those who do not. The reference group in the equations is adults 35–49 years of age. In the FREE regression, only young adults (19–34 years) are significantly likely to use less services, whereas in the PAY regressions, adults over 65 years of age have significantly fewer visits than all other categories. Family size is negatively related to quantity of visits, although the relationship is significant only in the PAY regressions.

Neither perceived health status nor disability days are significantly related to number of visits. The dummy variables which are intended to capture severity of illness show different patterns for the PAY and FREE users. However, the overall pattern for both indicates a direct relationship between level of use and severity of condition, although not all of the variables show statistical significance. Relative to those reporting nervousness or depression, PAY users reporting a neurosis have significantly more visits. The opposite occurs for FREE users, with those reporting neurosis having fewer, although not significantly fewer, visits. To the extent that FREE users receive services in settings which are short-term in orientation, this finding of a lower level of use for those with neurosis is expected. As might be expected, those PAY users reporting more serious conditions defined as psychosis and other mental disorders have more visits than those reporting nervousness or depression, although the relationship is not statistically significant. This pattern for the more serious disorders does not appear for the FREE users, although for the less seriously ill users, i.e., those who report seeing a mental health provider but report no condition or counseling as the reason for the visit, the relationship is significantly negative.

Those who do not reside in the 16 largest SMSAs have fewer visits than those who do reside in these large metropolitan areas—although this relationship is significant only for PAY users. There do not appear to be substantial regional differences. The county-level psychiatrist-

population ratio is positively associated with number of visits, although it is marginally significant in only the FREE regression.

Neither (1) residing in a state where mental health benefits are mandated or mandated to be offered as an optional rider in insurance policies nor (2) residing in a state which has a freedom of choice law regarding the equivalent treatment of psychologists and psychiatrists influences level of use for PAY users in terms of visits. However, for FREE users, there is a significantly negative relationship between quantity of visits and state mandates for mental health coverage. This latter finding is curious, since mandates are related to private insurance and, for the most part, the payment for FREE users comes from public sources such as Medicaid or community mental health centers; hence, an insignificant relationship would be expected. Perhaps states which have mandated private insurance coverage have less generous coverage for publicly funded mental health services.

ANNUAL EXPENDITURES

The dependent variable in the three equations presented in Table 3 is annual expenditures on ambulatory mental health services in the specialty sector. As in the visit analysis in the preceding section, the equations are shown for two classes of users: users with out-of-pocket expenses (PAY) and users without out-of-pocket expenses (FREE).

Both regressions which were limited to PAY users had significantly negative price effects. This is not consistent with Wells et al. [14], which examined level of specialty mental health in terms of expenditures and did not find significant price effects.

The price variable in PAY I is the average percent paid out-of-pocket per visit, and is negative and significant with an elasticity of $-.54$. This indicates that a 10 percent increase in the percent paid out-of-pocket per visit is associated with a 5.4 percent decrease in total expenditures. In PAY II, the price specification contains the two components of net price: average price per mental health visit and average percent paid out-of-pocket per mental health visit. Note that net price equals average price times percent paid out-of-pocket. This specification allows for an examination of the effects of quality on demand for mental health services. The average percent paid out-of-pocket per visit remains negative and significant with an elasticity of $-.46$. However, the average charge per visit is significantly positive with an elasticity of $.80$. Recall that the average charge per visit is a measure of gross price. Differences in gross price are assumed to reflect quality differences. Quality of a visit is used in a very loose sense and could

Table 3: Ambulatory Mental Health Services in the Specialty Sector—Weighted OLS Equations for the Logarithm of Total Expenditures for Users with (PAY) and without (FREE) Out-of-Pocket Expenses

<i>Variable Description</i>	<i>Variable Name</i>	PAY I	PAY II	FREE I
<i>Price/Insurance</i>				
Log of the average percent paid out-of-pocket per visit	LAVFPCT1	-0.542 ^c (5.49)	-0.457 ^c (5.52)	— —
Log of the average charge per visit	LAVCHRG1	—	0.798 ^c (12.34)	—
Any Medicaid coverage (1 = yes)	MEDICAID	—	—	0.435 ^c (1.89)
<i>Demographic</i>				
Sex (1 = male)	SEX	0.245 ^a (1.76)	0.107 (0.91)	-0.174 (0.88)
Race (1 = white)	WGTRACE	0.707 ^c (2.12)	0.499 ^a (1.79)	0.041 (0.13)
0-18 years	CHILD*	-0.264 (1.20)	-0.048 (0.26)	-0.003 (0.01)
19-34 years	YADULT*	-0.233 (1.27)	-0.056 (0.36)	-0.395 ^a (1.64)
50-64 years	OADULT*	-0.227 (0.98)	-0.299 (1.54)	0.085 (0.28)
> 65 years	SENIOR*	-1.516 ^c (3.98)	-1.158 ^c (3.63)	0.021 (0.03)
Log of family income	LINCOME	0.013 (0.17)	0.012 (0.18)	-0.08 (0.74)
Log of years of education of family head	LHEADEDU	0.284 ^b (1.94)	0.185 (1.51)	-0.020 (0.12)
Employment status (1 = not in labor force)	NOWORKER	-0.102 (0.67)	-0.175 (1.38)	-0.196 (0.91)
Log of family size	LFAMSIZE	-0.424 ^c (3.12)	-0.405 ^c (3.57)	-0.204 (1.04)
<i>Health</i>				
Perceived health status good or excellent	GOODHEAL†	0.377 (1.87)	0.146 (0.86)	0.235 (1.07)
Perceived health status unknown	UNKHEAL†	0.377 ^a (1.54)	0.146 (0.39)	0.235 (0.94)
Log of disability days	LDISDAYS	-0.002 (0.07)	-0.007 (0.39)	-0.009 (0.31)

Continued

Table 3: Continued

<i>Variable Description</i>	<i>Variable Name</i>	PAY I	PAY II	FREE I
Psychosis	PSYCHOS†	0.654 (1.47)	0.544 (1.46)	0.053 (0.09)
Other mental disorder	OTHMDIS†	0.448 ^a (1.74)	0.353 ^a (1.64)	-0.174 (0.50)
Neurosis	NEUROS†	0.430 ^a (1.82)	0.458 ^b (2.32)	-0.573 ^a (1.80)
No condition— counseling	COUNSEL†	0.156 (0.72)	0.105 (0.58)	-1.368 ^c (4.32)
No condition—no reason for visit	MHPROV†	-0.155 (0.62)	-0.194 (0.93)	-1.298 ^c (4.34)
<i>Community</i>				
SMSA—not 16 largest	OTHSMSA§	-0.334 ^b (2.14)	-0.373 ^c (2.87)	-0.053 (0.24)
Not in SMSA	NONSMSA§	-0.508 ^b (2.29)	-0.548 ^c (2.95)	-0.450 (1.45)
Mandated mental health coverage (1 = yes)	MANDATES	0.335 ^a (1.71)	0.110 (0.67)	-0.336 ^b (1.33)
Freedom of choice law (1 = yes)	FOC	-0.032 (0.16)	-0.012 (0.07)	0.348 (1.32)
Northcentral census division	CENTRAL	-0.238 (1.11)	-0.086 (0.48)	-0.255 (0.89)
Northern census division	EAST	-0.260 (1.17)	-0.204 (1.09)	-0.171 (0.54)
Western census division	WEST	-0.684 ^c (3.07)	-0.104 (0.55)	0.196 (0.59)
Log of county median years of schooling	LYRSCHOO	0.713 (0.54)	0.371 (0.34)	0.999 (0.67)
Log of psychiatrists per 1,000 county population	LPSYPOP	0.069 ^b (2.11)	0.030 (1.08)	0.056 (1.55)
<i>Intercept</i>	INTERCEPT	4.267 (1.26)	2.913 (1.03)	8.733 (2.25)
<i>Statistics</i>				
<i>R</i> -squared		.317	.525	.274
<i>F</i> ratio		5.80	13.27	3.15
Degrees of freedom		349	348	234

*Married omitted.

†Perceived health status fair or poor omitted.

‡SMSA—16 largest omitted.

§No mandates for mental health coverage omitted.

||Southern census region omitted.

**Levels of significance are a = .10, b = .05 and c = .01.

††*t*-Statistics are in parentheses.

include many different things such as: skill, experience, and training of the provider; amenities of the setting; length of visit, etc. If there were no differences in quality of care, the elasticity for the average charge would be 1.0 minus the "pure" price elasticity of demand, since there is an identity between total expenditures and number of visits times average charge per visit. However, it is less than 1.0 and indicates that a 10 percent increase in average charge per visit is associated with an 8 percent increase in total expenditures. This means that as the average charge of a visit increases, the level of use of total expenditures increases less than proportionally. This can be interpreted to mean that higher quality visits, i.e., visits with a higher gross price, are associated with a reduction in the number of visits demanded. The elasticity of visits with respect to average charge which accounts for quality ($.8 - 1.0 = -.2$) is lower than the elasticity for visits with respect to the percent paid out-of-pocket which is a measure of the "pure" price effect ($-.46$). This indicates that when quality of visits is accounted for, the price responsiveness of demand is not as strongly negative.

In general, the same other independent variables remain significant as in the visit equations and will not be discussed separately.

DISCUSSION

Cost-sharing does indeed matter in the demand for ambulatory mental health services from specialty providers. The price variables are significantly negative for the probability of use equations and the level of use equations for individuals who have out-of-pocket expenses. The price responsiveness for the level of use equations is more strongly negative than for the probability of use equations. This means that the decision to use mental health services is affected by the level of cost-sharing to a lesser degree than is the decision regarding the level of use of services.

For users with out-of-pocket expenses, the magnitude of the price responsiveness is more pronounced in the expenditure equations than in the visit equations, indicating that a lower level of cost-sharing is associated with the use of more expensive providers.

It was assumed that differences in the average charge for a visit were a reflection of differences in the quality of a visit. The empirical results suggest that the quality of a visit does matter in the demand for mental health services. When the quality of a visit is accounted for, the price responsiveness is less strongly negative.

The insignificance of the income variable in both the probability

and level of use equations runs counter to the stereotype of specialty mental health services being used primarily by the upper middle class. The small and generally insignificant effects of income could be expected to the extent that poorer mental health status is correlated with lower income. Another explanation relates to the proposition that permanent rather than transitory income is related to use of mental health services. Education of family head, which is positively associated with mental health demand, could be construed to be a proxy measure for permanent income, while the included family income variable may be measuring transitory income.¹¹

The insignificant income effects could also be an indication that perhaps some of the social programs initiated in the 1960s and 1970s, such as Medicaid and community mental health centers, have had an impact in improving access to care. Medicaid appears to be serving a role in getting persons to use specialty mental health services both with respect to initial access to mental health services and extent of use relative to other sources of free care. The effects of deinstitutionalization may be reflected in the importance of the Medicaid variable to the extent that the chronically mentally ill are eligible for Medicaid coverage.

The findings of this paper also counter the stereotype of greater use of the specialty mental health sector by females. Females were not more likely to use the specialty sector and, when they did use services, they did not have a significantly higher level of use.

The results provide some evidence that lower mental health status is positively associated with demand for specialty mental health services. Those with less serious mental conditions do appear to use less services. The positive association between poor or fair physical health status and probability of use of mental health services, as well as the positive relationship with number of disability days, provide evidence of comorbidity of physical and mental conditions.

The psychiatrist-population ratio is significantly positive in the probability of use equations but, in general, not in the level of use equations. This does not provide much support for the provider-induced demand theory, since the provider presumably exerts more influence after the decision to use services has been made. The positive sign on the probability of use equation cannot be interpreted unambiguously. Do providers locate in areas of high demand for services or is the demand high because they are located there?

Finally, in the probability of use equations, the significantly positive sign on the variable reflecting whether the state in which an indi-

vidual resides has mandated mental health benefits provides support for the notion of bandwagon effects. One would expect that the effect would be stronger in the probability of use equations than in the level of use equations, which are in fact negative, because most laws mandate a fairly low minimum level of benefits.

The focus of this article has been on cost-sharing and its influence on the demand for ambulatory mental health services from specialty providers. The results indicate that while price is an important factor, it is only one of several important factors in determining the demand for services. The estimated equations show a large amount of unexplained variance—especially in the probability of use equations. It is expected that if adequate mental health status measures were included, the unexplained variance would be somewhat reduced.

A final question remains about the demand for ambulatory mental health services. Is the demand for these services more elastic than the demand for ambulatory medical services? Two other studies have found the demand for ambulatory mental health services to be very price-responsive (McGuire, [13] and Frank [15]). Another study using data from the Rand health insurance experiment found that the use of ambulatory mental health services is indeed responsive to cost-sharing—however, not significantly more than for ambulatory medical services [14]. The work of Ellis and McGuire [16] challenges the interpretation of Wells et al. [14], and suggests that further analysis of the Rand data taking into account a design peculiarity of the experiment could show that ambulatory mental health services are more price-responsive than ambulatory medical services.

The elasticities presented in this analysis indicate that mental health services are more price-responsive at least for level of use. Examination of the demand for ambulatory physician visits using the same database and similar price specifications in the level of use equations found elasticities which ranged from $-.06$ for probability of use to $-.25$ for annual expenditures (Taylor et al. [17]). The elasticities for ambulatory mental health services, ranging from $-.27$ for probability of use to $-.54$ for annual expenditures, are consistently more elastic than for ambulatory medical services.

In conclusion, it does appear that the demand for ambulatory mental health services is fairly price-responsive, certainly more so than the demand for ambulatory medical services. Any overall assessment of the impact of changing the level of cost-sharing for mental health services either to specific groups, such as employee groups, or as a more broad-based change, such as in state mandates for mental health bene-

fits under private insurance, must take into account the fact that cost-sharing affects both components of demand. Not only will decreased cost-sharing encourage more people to use mental health services, it will also encourage a greater number of visits given that mental health services are used.

The implication of this analysis is that expanding insurance coverage for ambulatory mental health services by reducing the amount of cost-sharing will increase use and expenditures significantly for these services. Conversely, increasing cost-sharing provides an incentive to lower utilization. The results suggest that states which mandate minimum benefits for mental health coverage can expect to experience increased utilization of services. The results also suggest that cost-sharing devices are effective in limiting the volume of mental health services which are consumed.

Although cost-sharing devices, such as deductibles, copayments, and limits, provide an incentive to lower utilization, consideration in benefit design needs to be given to the differential impact of each of these devices on the consumer. Deductibles may discourage the consumer from entering treatment, whereas limits provide an incentive to end a course of treatment. It is of concern that the cost-sharing devices used in insurance may provide incentives to consumers to inappropriately tailor treatment decisions according to the terms of their insurance (Dickey et al. [18]).

The debate over the appropriate level of cost-sharing for ambulatory mental health services should also focus on factors other than price responsiveness in assessing what is the socially desirable level of mental health coverage. Although cost-sharing may be effective in limiting the utilization of ambulatory mental health services, it provides no guarantee that services will be used by those most in need of services or that an appropriate level of care will be used. In considering which cost-sharing devices to institute at what levels of ambulatory mental health services, policymakers should be aware of factors which influence the use of other health care services. The offset effect, that is the reduction in the use of medical services by users of mental health services, is a particularly important issue. Another consideration is the substitution of less costly ambulatory mental health services for inpatient mental health services. Research into these topics should significantly increase our knowledge of the complexities surrounding the use of mental health services and provide a better basis for the policy decisions which are being made regarding mental health services.

APPENDIX

Table A1: Weighted Means and Standard Deviations for Variables in Probability of Use Equations (Table 1)

<i>Variable Name</i>	<i>Mean</i>	<i>Standard Deviation</i>
Dependent variable: Specialty user	0.019	12.93
Dependent variable: General user	0.029	15.67
PSYCHOP	0.801	37.32
POPPFD	0.239	39.89
POPPCON	0.481	35.63
COV2	0.173	35.35
COV3	0.029	15.60
COV4	0.036	17.52
COV5	0.181	36.05
COV6	0.066	23.17
COV7	0.208	37.96
MEDICAID	0.078	25.05
PPOVFD	0.242	40.07
PPOVCOIN	0.339	33.82
PSYCHDIF	0.398	45.78
AGE	32.96	2,055.06
AGESQ	1,569.07	163,973.32
SEX	0.484	46.76
WGTRACE	0.868	31.64
INCOME	20.71	1,745.37
HEADEDUC	11.39	347.33
NOWORKER	0.296	42.72
FAMSIZE	3.69	180.27
YOUNG	0.282	42.08
SINGLE	0.152	33.58
WIDOWED	0.057	21.72
DIVORCED	0.052	20.83
UNKMAR	0.010	9.55
GOODHEAL	0.825	35.54
UNKHEAL	0.041	18.64
DISDAYS	12.67	3,140.28
OTHMSA	0.442	46.47
NONMSA	0.312	43.36
CNTY66	4.51	76.41
BENMAN	0.102	28.34
BENAVAIL	0.218	38.66
FOC	0.592	45.98
CENTRAL	0.291	42.51
EAST	0.212	38.25
WEST	0.179	35.86
PSYPOP	0.085	14.47
MDPOP77	152.75	8,862.78

Table A2: Weighted Means and Standard Deviations for Variables in Specialty Level of Use Equations for FREE and PAY Users (Tables 2-3)

<i>Variable Name</i>	PAY		FREE	
	<i>Mean</i>	<i>Standard Deviation</i>	<i>Mean</i>	<i>Standard Deviation</i>
Dependent variable: Log number of visits	1.65	94.49	1.36	84.92
Dependent variable: Log expenditures	4.55	115.31	4.12	110.10
LAVFPC1	4.20	55.36	—	—
LAVFAMT1	2.49	85.23	—	—
LAVCHRG1	2.89	72.08	—	—
MEDICAID	—	—	0.341	34.46
SEX	0.424	38.82	0.480	36.31
WGTRACE	0.952	16.83	0.896	22.23
CHILD	0.204	31.67	0.286	32.84
YADULT	0.391	38.33	0.311	33.63
OADULT	0.148	27.90	0.144	25.48
SENIOR	0.040	15.45	0.024	11.16
GOODHEAL	0.785	32.30	0.620	35.28
UNKHEAL	0.021	11.38	0.012	7.98
LINCOME	9.67	76.68	9.236	80.51
LHEADEDU	2.51	38.96	2.319	39.02
NOWORKER	0.372	37.96	0.545	36.19
OTHSMSA	0.423	38.81	0.483	36.32
NONSMSA	0.183	30.40	0.223	30.25
LFAMSIZE	1.01	45.88	1.13	45.22
MANDATES	0.38	38.14	0.40	35.67
FOC	0.70	36.00	0.69	33.67
CENTRAL	0.254	34.20	0.312	33.66
EAST	0.288	35.56	0.273	32.38
WEST	0.225	32.78	0.208	29.49
LYRSCHOO	2.47	5.62	2.46	5.98
LPSYPOP	-3.42	234.18	-4.11	253.91
LDISDAYS	1.052	241.00	1.17	248.73
PSYCHOS	0.028	13.02	0.026	11.59
OTHMDIS	0.133	26.72	0.132	24.62
NEUROS	0.183	30.37	0.197	28.92
COUNSEL	0.343	37.30	0.269	32.24
MHPROV	0.165	29.14	0.238	30.94

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NOTES

1. In the NMCES sample, approximately 35 percent of users who had no out-of-pocket expenses were on Medicaid versus 4 percent of those who had some out-of-pocket expense. Users of free care also had a lower mean number of visits than did those who paid something out-of-pocket (7.8 visits versus 10.2 visits).
2. The logistic regressions (logit) which are presented in Table 1 are unweighted. A logit program has not yet been developed which accounts for a complex survey design [19]. To handle this inadequacy a given equation was run using three techniques: unweighted logit, unweighted ordinary least-squares and weighted least-squares. The differences between the unweighted and weighted least-squares suggest the differences that might be found between the unweighted logit and a weighted logit technique if it were available. Only the logit regressions for the probability of use are shown in this article; the ordinary least-squares regressions are available from the author upon request. The coefficients in the unweighted and weighted ordinary least-squares regressions were remarkably similar. The signs of the coefficients were in the same direction and, in general, the same independent variables remained statistically significant when traditional *t*-tests were performed. The magnitudes of the OLS coefficients compared to the logit marginal effects were roughly equivalent.
3. The direction of the bias in using the average percent paid out-of-pocket in the level of use equations is ambiguous. Newhouse [20] provides an excellent review of the measurement problems which occur in measuring the price variable when using survey data. Using the average percent paid out-of-pocket is equivalent to constructing an observed coinsurance rate. The complexities of insurance policies in terms of copayments, deductibles, and upper limits make specification of this observed coinsurance rate error prone [21].
4. Ideally, the entire NMCES sample of 40,000 individuals would be used to estimate these equations; however, detailed insurance information is available only on a subsample of individuals who were involved in the Health Insurance/Employer Survey (HIES)—representing slightly more than 24,000 individuals. A weight was applied to each individual in the HIES sample in order to transform the data into a sample representative of the civilian noninstitutionalized population of the United States. See Cohen and Farley [5] for details.
5. I am grateful to Pamela Farley for her assistance in developing the algorithm for constructing coinsurance rates.
6. The coefficients in the logit equations must be converted to the first derivatives of the dependent variable in order to allow examination of the

marginal effects of the independent variables. The marginal effect in the logit model may be calculated as follows:

$$\text{Marginal effect} = \hat{b} \cdot \bar{p} \cdot (1 - \bar{p})$$

- where \hat{b} = logit coefficient for independent variable of interest.
- \bar{p} = proportion of the population using mental health services.

7. Elasticity is a measure of the percentage change in one variable brought about by a 1 percent change in some other variable.
8. The elasticity in a logit model may be calculated as follows:

$$\text{Elasticity} = \hat{b} \cdot (1 - \bar{p}) \cdot \bar{X}$$

- where \hat{b} = logit coefficient for the independent variable of interest.
- \bar{p} = proportion of the population using mental health services.
- \bar{X} = mean of the independent variable of interest.

9. In addition to the two probability of use equations presented in the text, equations using other price specifications were estimated. The negative relationship between cost-sharing and the probability of using services was not very sensitive to these alternative specifications. Merely having some coverage for ambulatory psychiatric services is not significantly related to the probability of using these services; however, having first-dollar coverage for psychiatric visits bears a significantly positive relationship. When both the psychiatric coinsurance rate and a dichotomous variable reflecting first-dollar coverage are entered in the same regression, the former remains negative and the latter remains positive; however, the significance level of both variables decreases. To control for the influence of Medicaid, a variable reflecting whether a person was covered by Medicaid at any point during the year was added to the dummy insurance specification. The full-coverage dummy becomes insignificant and the Medicaid dummy is significantly positive, indicating that persons who have full coverage for psychiatric services because they are on Medicaid are more likely to use these services than other individuals who have full coverage, represented mostly by those covered under prepaid plans.
10. Not shown is a regression which includes both individuals with and without out-of-pocket expenses. The price variable, the log of the average percent paid out-of-pocket, was not significant. The fact that this same variable is significant when the regression is limited to those with out-of-pocket expenses (PAY I) indicates that excluding persons with free care does heighten the price elasticity. This confirms a difference in responsiveness between those who pay out-of-pocket and those who do not.
11. Including a permanent income measure in a demand function implies that an individual looks beyond the current time period in making decisions related to the demand for mental health services. I am grateful to Allan Goodman for pointing out the relevance of separating income into permanent and transitory components and for suggesting that some of the

literature on the demand for housing had useful applications for health services demand (Goodman and Kawai [22]).

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