Interactions between Use of and Insurance for Specialty Ambulatory Mental Health Services

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Abstract

Background: There is continuing interest in the effects of coinsurance rates on the use of ambulatory mental health services. Persons who expect to use mental health services may choose coverage with more generous mental health benefits, as such treatment may be expected to be a recurring activity. However, it may also be the case that if the expected need for such services is somehow reflected in lower perceived human capital in the labor market, then persons who have a higher probability of use may face a less generous set of health insurance options. These behaviors imply some simultaneity in the determinants of the coinsurance rate facing an individual and their mental health use.

Aim of the study: To explore the joint determination of the use of and coinsurance for ambulatory mental health services, using non-experimental data for a nationally representative sample of the non-institutionalized who had employer-based health insurance in the United States.

Methods: I estimate an instrument for the ambulatory mental health coinsurance rate. I then estimate two models of the demand for ambulatory mental health care as a function of the coinsurance rate for this type of care and other factors, one using the actual coinsurance rate and the other using the estimated instrument for the coinsurance rate.

Results: In the instrumental equation, an index of the mental distress of the key worker most likely to be the policy-holder has no statistically significant effect on the worker's coinsurance rate. However, a similar measure for other members of the worker's family has a positive and statistically significant effect on the worker's coinsurance rate. In the demand equations, neither the actual coinsurance rate nor its instrument has a statistically significant coefficient.

Discussion: Having another family member who may need mental health care results in some effort to seek a health plan with a higher coinsurance rate for such services. While the mental health index for the key worker would motivate the same type of seeking behavior, a higher level for this index for the key worker might also be correlated with a lower level of perceived human capital in a prospective employer's eyes, and this might result in a more restricted set of plan options for mental health care in the labor market. The absence of statistical significant for the coefficients of the actual coinsurance rate and its instrument also provides some limited but suggestive evidence of employer-side selection effects.

Limitations: It was not possible to model the full complexity of health plans.

Conclusions: The discussions of selection bias with regard to mental health insurance and service use should be expanded to include demand-side effects in the labor market, in addition to the supply-side effects on the part of workers that are often considered.

Implications for health care provision and use: It may be difficult to determine the effects on ambulatory mental health care of changes in health insurance provisions.

Implications for health policy formulation: Caution needs to be used in making estimates of the effects of changes in insurance coverage for ambulatory mental health care. Persons who find their benefits improved may not respond at the rate expected, because initial coinsurance rates are already in part intertwined with expected use.

Implications for further research: More analyses of the range of selection effects in labor markets and their impacts on health insurance are warranted. © 1998 John Wiley & Sons, Ltd.

Introduction

There is continuing interest in the effects of coinsurance rates on health care utilization, including the use of ambulatory mental health services. This interest was intensified by the recent health care reform debate in the United States, as decisions about coverage of ambulatory mental health benefits were and are being made based on assumptions about the expected responsiveness of mental health use to coinsurance rates, as well as on doubts about the accuracy of any such assumptions. Even as managed behavioral health care further penetrates the marketplace, there are still many persons for whom the coinsurance rate remains an important component of the decision to obtain care.

Extensive and sophisticated work on the effects of cost sharing on ambulatory mental health use was performed as part of the Rand health insurance experiment (HIE).[1] Significant effort was required to compensate for the effects of provisions of the HIE, such as financial hold-harmless provisions, that would distort relationships between (nominal) coinsurance rates and mental health use. Nevertheless, these analyses were based on an actual experiment, and even though the data on which the analysis was based are now

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almost 20 years old, the results therefore remain a benchmark for other analyses.

Outside the Rand HIE, true experimental data are difficult to come by. However, there have been several analyses of non-experimental data that analyze ambulatory mental health use as a function of coinsurance, among other variables. While some of these were limited to data from narrowly defined samples, a few studies utilized data for broad population groups. (See, for example, articles by Horgan[2] and Taube *et al.*[3]).

Mental health care is usually subject to separate provisions that provide less generous coverage (or no coverage at all), in part due to employer and/or insurer concerns over the extent of use and the resulting cost if coinsurance rates were low. If mental health coverage is mandated or otherwise changed, either through mental health parity legislation or broader health care reform, then many people might experience a decrease in the coinsurance rates they face for these services.

Mental health treatment is expected to be a recurring activity for many users. Therefore, persons who expect to use mental health services may choose coverage with more generous mental health benefits. Conversely, persons with no prior use and no expected use may be more willing to accept a job or choose a health plan with poor ambulatory mental health coverage. It may also be the case that if the expected need for such services is reflected explicitly or indirectly in perceived human capital in the labor market, then persons who have a higher probability of use may face a more limited set of options for ambulatory mental health insurance coverage than other workers. While the paths of such behavior are less obvious, Buchmueller finds empirical support for the statement that 'employer screening dominates high-risk [with respect to health expenditures] workers' desire to select jobs that offer [health] insurance'. This finding was based on an analysis of overall health insurance, but it may also apply to provisions for specific types of coverage such as ambulatory mental health coverage.

This behavior on the part of employees and/or employers implies some simultaneity in the determination of the coinsurance rate facing an individual and their mental health use. If such is the case, erroneous conclusions may result from taking experimental results and using them (in a simple fashion) to estimate changes in utilization for persons whose initial coinsurance rate is already in part intertwined with expected use. For example, if legislation were to mandate a specific level of coinsurance for ambulatory mental health care, persons who find their benefits improved may not respond at the rate estimated in the Rand HIE, where persons were assigned randomly to various levels of coinsurance.

These selection issues have also been analyzed to some degree by others (for example, see articles by Wolfe and Goddeeris,[5] Van de Ven and Van Praag,[6] Cameron and Trivedi[7] and Cameron *et al.*[8]), but in all these studies the possibility of employer-side selection was ignored. Such investigations have been rare with regard to the specific area of mental health services.

This paper presents an exploration of the joint determi- nation of use of and coinsurance for ambulatory mental health services, using non-experimental data for a nationally representative sample of the non-institutionalized in the United States. The next section presents a conceptual framework, and is followed by an outline of the estimation, then a description of the data. The results are presented in the next section, while a concluding discussion is offered in the last section.

Conceptual Framework

This analysis involves two markets, one decision-maker and possibly more than one consumer. The decision-maker is the employee, and the two markets are the labor market and the market for ambulatory mental health care. The consumers consist of all members of the employee's family.

One focus is the effect of coinsurance on the demand for specialty ambulatory mental health services. An equation is estimated for this market for mental health services, and following the lead of several other studies cited above, I assume that I am estimating the demand for ambulatory mental health services as a function of several factors, including coinsurance rates. Low coinsurance rates (prices) are expected to result in greater use of ambulatory mental health services, all other things being equal.

However, as described above, persons who expect to use such services may seek insurance that has low coinsurance rates for this type of care. From a strictly formal perspective, in the absence of independent knowledge of the 'true' relationships, one cannot know the effects of the resulting bias on coefficients for specific variables. Nevertheless, if the specific selection behavior being considered is the choice of a policy with a lower coinsurance rate to lower the cost of higher expected use, it would seem likely that such selection would strengthen (that is, make more negative) the relationship between the coinsurance rate and use. Conversely, to the degree that selection is occurring on the part of employers that prevents workers with higher expected use from obtaining insurance with lower coinsurance rates, the estimated effect of the insurance price on use would be expected to be muted.

The other market considered here is the labor market in which employment decisions are made by potential workers and employers, based on the multi-dimensional characteristics of the worker and the multi-dimensional characteristics of the job. Among the characteristics of a job is its health care coverage, and among the dimensions of the health coverage is the coinsurance rate for ambulatory mental health services. It is assumed here that a worker chooses a job, or a specific health plan among several choices at a job, in some small part with regard to the level of coinsurance for ambulatory mental health services, and as a function (in part) of expected use of such services. This assumption is in line with the empirical research on job mobility that finds that the risk of losing health insurance impedes job mobility (for a review of much of this work, see an article by Monheit and Cooper[9]). Expected health care use might be a function of past use (unavailable to us with this data set),

and characteristics such as measures of mental distress. The choice set facing a worker is affected by prospective employers' perceptions of the worker's human capital and the costs of employing the worker. To the degree that the potential costs of health care use are measured or proxied by other variables in the job search process, the choice set presented to any given worker by employers may be constrained.

This analysis attempts in a small way to incorporate consideration of other family members, as decisions regarding health care coverage are in part made on a family level. Whether the 'breadwinner' seeks coverage for mental health services may be influenced by whether or not another family member is expected to require such services. A simplified sense of the analytical framework is provided below, and is expressed more formally by Cameron and Trivedi[7] and Cameron et al.[8]

A worker chooses among health insurance choices depending on the worker's characteristics, the expected health state of family members, the characteristics of the insurance policy, the cost of the coverage and the perceived effects of health care on health. One of the attributes of the insurance policy is the rate at which the policy reimburses for ambulatory mental health care. Among the components of the health state are measures of the level of mental distress of the worker and members of his/her family. This analysis focuses on these two subsets of attributes. While ideally one would include all of the attributes of the insurance policy and all health-related attributes of the worker and his/her family, data on many characteristics of the policy are not readily available, aside from the intractability of attempting to incorporate such a level of complexity into the estimation.

To maximize expected utility the consumer chooses between a discrete number of health insurance policies. The range of policies results from the combination of the worker potentially facing offers from more than one employer, and from some employers providing individually a choice among several insurances. A worker will choose that policy among the choice set facing him/her with the highest expected utility, based on his/her characteristics and relevant characteristics of his/her family.

This analysis is restricted to only those persons with employer-based health insurance who were not enrolled in a health maintenance organization (HMO). HMOs have their own ways to determine (and restrict) use that cannot be measured with these data.

Methods

The focus of this analysis is the degree to which the coinsurance rate for ambulatory mental health care in a worker's policy may not only affect this use but also be affected in turn by expected use. To the degree that the coinsurance rate may in some part be jointly determined with mental health care use, a simple single-equation estimation of demand may yield biased estimates.

To correct for this I estimate an instrument for the ambulatory mental health coinsurance rate. In addition to including all variables that appear in the demand equation, this instrumental equation incorporates variables that characterize the key worker's (defined below) employment situation but which are expected to be unrelated to the demand for mental health care.

There is reasonable variation in the values for the ambulatory mental health care coinsurance rate in the sample. As a result, it is reasonable to treat it as a continuous variable. However, the coinsurance rate is bounded between '0' and '100', with some concentration of values observed at both of these two extremes. Consequently, the instrumental equation for the ambulatory mental health care coinsurance rate is estimated as a Tobit model with censoring at both an upper and a lower bound.

This equation yields predicted values that are then used as an instrumental variable in estimating use. Following a standard two-part model, use is divided into two components: (i) the probability of use, estimated using a probit specification, and (ii) the amount of use given that a person is a user, estimated using OLS on the log of the number of visits. Because of the small number of users available for part (ii), the results for part (ii) are not presented.

All estimation was performed using weights designed to account for both non-random sampling and response rates for key variables in the data used here, such as the coinsurance rate for ambulatory mental health care.

Data

The data used in this analysis are from the Household Survey of the 1987 National Medical Expenditure Survey (NMES). The Household Survey consisted of a nationally representative sample of the entire US civilian non-institutionalized population, and was designed to provide measures of health status, insurance coverage, health care services use and expenditures for the period from 1 January to 31 December 1987. For a detailed description of the survey design, including weighting for non-response and post-stratification, see Cohen et al.[10]

Selection of Events for Analysis

The ideal set of visits for this analysis would be those that were specifically covered by the provisions for ambulatory mental health care in each person's insurance policy. However, it is not possible to ascertain this directly, so assumptions were made. Ambulatory office-based visits and outpatient hospital visits were counted as mental health visits that would be covered by the separate specialty ambulatory mental health care coverage provisions of private insurance if either of the following two conditions applied:

(i) the main reason for the visit was to obtain psychotherapy/mental health counseling or
(ii) the provider was identified as a psychiatrist, a psychologist or a mental health counselor.

Physician visits not indicated as being to a psychiatrist *and*

not having psychotherapy/mental health counseling as the main reason for the visit were excluded even if a mental health condition was listed among the reasons for the visit. It is highly unlikely that such visits would be covered by the provisions for ambulatory mental health care in a person's insurance policy.

Definition of Key Person and Determination of Coinsurance Rate

While the term 'family' will be used here, more precisely the analysis uses a construct called a 'health insurance eligibility unit' (HIEU). This construct was created (as part of other analytical efforts with the 1987 NMES) in order to identify dependents in a manner consistent with general insurance practices. It represents groups of persons who would most likely be covered together under a typical health insurance policy with family coverage, or by single coverage in the case of a single-person HIEU. Each HIEU was formed initially from a married couple or a single adult. Then all unmarried minors (i.e., children ages 0–17), and persons aged 19–23 who were full-time students sometime during the year and not married or separated, were linked to their married or single parents or guardians. Older children and married children living in households with their parents were assigned to separate HIEUs.

In this analysis it was not possible to link the family's ambulatory mental health coinsurance rate to a specific worker's employer-based policy. Consequently, for estimation purposes a 'key' person was designated for each family (HIEU) under the assumption that this person was the one most likely to have the greatest choice among health plans, including coverage for ambulatory mental health care, and further that it is primarily the characteristics of this key person and his/her employment situation that affect the choice set. The following rules were used to define six mutually exclusive and exhaustive categories of key person, based on labor force attachment and traditional notions of the 'breadwinner' (including outcomes of discrimination that can result in better employment opportunities for men):

(i) key person is the only member of single-person HIEU;
(ii) key person is husband who works more than 35 hours per week, while wife works less than 35 hours or not at all or is not present;
(iii) key person is wife who works more than 35 hours per week, while husband works less than 35 or not at all or is not present;
(iv) key person is husband who works more than 35 hours, while wife also works more than 35 hours;
(v) key person is husband who works less than 35 hours per week, while wife also works less than 35 hours or not at all or is not present;
(vi) key person is wife who works less than 35 hours per week, while husband does not work or is not present.

This analysis includes only families where the key person was employed and was between the ages of 18 and 64, and where the family's health care expenditures consisted almost exclusively of either payments from employer-based health insurance or out-of-pocket payments.

The distribution of families in our analytical sample among the above six categories is as follows:

(i)	only person in single-person HIEU is key	36.2%
(ii)	husband working full time is key	24.6%
(iii)	wife working full time is key	10.7%
(iv)	husband working full time is key	26.6%
(v)	husband working part time is key	1.2%
(vi)	wife working part time is key	1.2%.

Category (iv) (key person is husband who works more than 35 hours, while wife also works more than 35 hours) involves possibly more tenuous assumptions than the other categories, but only contains 26% of households. Furthermore, Schur and Taylor[11] found that in 1987 for married couples with both spouses employed, in over 90% of cases either only the husband had health insurance or both the husband and wife had health insurance—in only about 8% of cases was the wife the only one with health insurance.

Ambulatory Mental Health Care Coinsurance Rate

This coinsurance rate (that is, the percentage of the cost of a visit to be paid by the consumer) was derived from the Health Insurance Plans Survey, a part of the overall 1987 NMES survey effort that involved obtaining and abstracting data from insurance policies. Several pieces of data were abstracted that were relevant to constructing a coinsurance rate for ambulatory mental health care. These include data on whether ambulatory mental health care is covered by the policy at all, whether it is covered separately, what the coinsurance rate is if covered separately and what the basic medical coinsurance rate is. Piecing together the answers and values for the several relevant questions derived from the insurance plan abstraction allowed for the construction of a coinsurance rate for ambulatory mental health care for each worker. For example, if a coinsurance rate was listed specifically for ambulatory mental health care, this rate was used. If no such specific rate was provided, but the question of whether ambulatory mental health care was covered was answered 'Yes', then the basic medical coinsurance rate was used.

Employment Variables for the Key Person

Several characteristics of the job of the key person are available in NMES, and are used to estimate an instrument for the coinsurance rate for ambulatory mental health care. Specifically, dummy variables for the following occupational categories were used:

(i) professional, technical, managerial and administrative;

(ii)   sales and clerical;
(iii)   craftspersons;
(iv)   transportation workers;
(v)   service workers and laborers;
(vi)   farm laborers;
(vii)   farm owners and managers and unknown occupations and
(viii) operatives (the omitted category in the analysis).

The following categories of firm size were also employed:

(i)   1–9 workers;
(ii)   10–25;
(iii)   501+ and
(iv)   26–500 (the omitted category).

Finally, dummy variables were also included to indicate whether the worker was self-employed or a member of a union.

Characteristics of Persons

Most of the independent variables described in this section are similar to those used by Keeler *et al.*[1] and the other studies cited above, with the same *a priori* expectations.

Socioeconomic Variables

Data on the following characteristics were utilized: age, race, gender, years of education, log of family income and family size. As the log of family income was used, families with zero income or negative income were assigned a value of '0' for log of income.

Physical Limitations

Two variables were utilized here on limitations: limitations in activities of daily living (ADLs) and limitations in instrumental activities of daily living (IADLs). It is expected that greater physical health problems and limitations on physical activity increase the probability that one seeks care for a mental problem (see, for example, the work of Keeler *et al.*[1]).

Measures of Mental Health

There were five questions in a self-administered questionnaire, answered by most NMES respondents, relating to mental health, that were taken from the battery of questions used in the Rand Health Insurance Study and later incorporated into the SF-36 Health Survey.[12] These questions asked how much of the time during the past thirty days a person (i) was a very nervous person, (ii) felt calm and peaceful, (iii) felt downhearted and blue, (iv) was a happy person, (v) felt down in the dumps. Responses ranged from 1 (none of the time) to 6 (all of the time).

After standardizing the responses to the five items so that high scores indicated greater problems, a mental health status index was created by summing the five items. Therefore, a high score on the index indicates more severe mental health problems. An unweighted summation of these five items was also used by Rand in analyzing the Health Insurance Experiment, and psychometric analyses have indicated that such an index correlates highly with a more sophisticated index derived from a 38-item mental health inventory.[13] The analysis was also conducted with each of the components entered separately in place of the index for both the key worker and other family members. The overall results did not improve with the breakout of these variables. Lastly, a dummy variable was also included to account for missing responses to these self-administered mental health status questions.

The mental health status index for the key person in each HIEU was included in the analysis. For the worker a worse mental health status might increase his/her desire to have a lower coinsurance rate, but employer perceptions might work against this preference. The worker may also prefer a lower coinsurance rate because of the need of *other* family members. Therefore I also include in this analysis the highest value of the mental health status index among any other persons in the HIEU. For HIEUs with a size of '1', or for families with no non-missing values of the MHI for persons other than the key person, a value of '0' was assigned for this variable. Where there were other members of the HIEU for all of whom the MHI was missing, a dummy variable for this absence of index values was set equal to '1'.

Local Area Variables

Variables at the county level were obtained or constructed from the Area Resource File for psychiatrists *per capita* and the median level of schooling. Finally, dummy variables were used for the four Census regions of the United States. These variables measure or proxy the availability of specialized mental health resources and attitudes towards such treatment.

Results

Table 1 presents the means and standard deviations of the variables used in this analysis. On average, individuals in the sample were required to pay 45.6% of the costs of ambulatory mental health services (ignoring the effects of deductibles, maximum plan payouts etc). While precisely comparable statistics are not available, this mean ambulatory mental health coinsurance rate is consistent with the less quantitative data on outpatient mental health benefits reported by the US Bureau of Labor Statistics for employees of medium and large firms (US Department of Labor, 1987, Table 41[14] and 1990, Table 48[15]).

Table 2 presents the equation for the instrument for the coinsurance rate. Neither the mental health index for the key worker nor the dummy for missing this index have remotely significant coefficients. However, the coefficient for the highest level of the index among other members of the family is significant at the 6% level. These results might be interpreted as providing some support for the presence of employer-side selection effects with regard to the coinsurance rate for ambulatory mental health services, as follows: having another family member who may need mental health care results in some effort to seek a health

Table 1. Sample means and standard deviations ($N = 3098$)

Variable	Mean	Standard deviation
Any specialty MH use in family	0.061	0.239
Ambulatory MH coinsurance rate	45.6	29.5
Age	37.8	11.5
Family size	2.895	1.546
Female	0.259	0.438
Education (less than High School omitted):		
High school or 1–3 years college	0.593	0.491
College diploma	0.148	0.355
More than college	0.126	0.332
Hispanic	0.051	0.220
Black	0.085	0.278
Other	0.028	0.166
Log (family income)	10.408	0.873
MH index	9.693	4.896
MH index—missing	0.097	0.296
Highest MH index—non-key person	6.677	6.628
ADLs	0.0057	0.1365
IADLs	0.0060	0.0992
Occupation (operative omitted):		
Craftsperson	0.146	0.353
Transport operative	0.050	0.219
Farm laborers	0.008	0.091
Prof., tech., manage., admin.	0.352	0.478
Sales and clerical	0.217	0.412
Service workers and laborers	0.114	0.318
Farm owners and manag., missing	0.023	0.150
Establishment size (26–499 omitted):		
Establishment size 1–9	0.212	0.409
Establishment size 10–25	0.150	0.357
Establishment size 500+	0.188	0.391
Union	0.183	0.387
Self-employed	0.102	0.302
Psychiatrists/population in county	0.106	0.111
Median county schooling	12.36	0.575
North central	0.265	0.441
South	0.357	0.479
West	0.166	0.372

Data Source: 1987 National Medical Expenditure Survey.

plan with a higher coinsurance rate for such services. While the mental health index for the key worker would motivate the same type of seeking behavior, a higher level for this index for the key worker might also be correlated with a lower level of perceived human capital in a prospective employer's eyes, and this might result in a more restricted set of plan options for mental health care in the labor market. (The channels through which such outcomes might occur are discussed in more detail in the concluding section).

Education has a statistically significant impact on the coinsurance rate, both for the key worker and for county level median educational attainment. Higher income levels are also associated with lower coinsurance rates. However, gender, race/ethnicity and age do not.

Many of the coefficients for variables that measure occupation or firm size are significant. In comparison to operatives (and holding other variables constant), transport operators have higher levels of coinsurance for ambulatory mental health care, as do service workers and laborers. The three dummies for firm size display a monotonic progression,

with a lower level of coinsurance associated with a larger firm size. Finally, being self-employed raises the coinsurance rate by 14 percentage points, while being in a union lowers it by 4.3 points.

Finally, workers in the north central and south regions of the country have lower rates of coinsurance than those in the northeast.

Several specification tests were performed to determine the validity of the instrumental variable procedure. A likelihood ratio test was performed to determine whether the variables used as instruments added significantly to the explanatory power of the instrumental equation. In addition, and as described by Nelson and Startz,[16] a test of whether the variables used as instruments are poor ones was performed. Finally, a test of the over-identification restriction of excluding the instruments from the demand equation for any ambulatory mental health use, as described by Davidson and Mackinnon[17] (section 7.8), was also performed using a linearized version of the model. The instrumental equation used here passed all of these tests.

Table 2. Instrumental equation for ambulatory mental health coinsurance rate ($N = 3098$)

Variable	Coefficient	Standard error
Constant	122.90***	20.07
Female	2.561	1.755
Black	1.545	2.494
Hispanic	−1.127	3.121
Other	−2.911	4.040
Age	−0.119	0.430
Age squared/100	0.056	0.523
High school or 1–3 years college	−4.298**	2.122
College degree	−7.073***	2.837
Post-college	−1.422	3.003
MH index—worker	0.147	0.181
MH index worker—missing	3.177	2.998
MH index—non-key	−0.281*	0.151
MH index non-key—missing	−2.577	2.320
ADLs	−12.274**	5.574
IADLs	12.895*	7.780
Family size	0.328	0.561
Log (income)	−3.425***	0.867
Psychiatrists/pop in county	−1.514	6.928
Median county schooling	−2.856**	1.389
North central	−7.178***	2.030
South	−4.109**	1.933
West	−3.702*	2.269
Occupation:		
Prof., Tech., Manage., Admin.	3.996	2.750
Sales, clerical	3.073	2.778
Crafts	3.062	2.862
Transport operator	7.974**	3.706
Service, laborers	7.157**	2.974
Farm laborers	−7.508	7.658
Farmers and unknown occupation	5.808	4.960
Self-employed	14.006***	2.668
Establishment size:		
Estab. 1–9	5.254***	2.054
Estab. 10–25	3.540*	1.981
Estab. 500+	−4.667***	1.815
Union	−4.265**	1.831
σ	35.681	0.551

Log-likelihood: −12 859.9.
* Statistically significant at 0.10 level, two-tailed test.
** Statistically significant at 0.05 level, two-tailed test.
*** Statistically significant at 0.01 level, two-tailed test.

Table 3 presents the results of the probit estimation of the probability of any specialty ambulatory mental health use. Two equations are presented. Equation A on the left side uses the actual values of the ambulatory mental health coinsurance rate, while Equation B (on the right side) presents the results using the instrument for the coinsurance rate, derived from the equation presented in **Table 2.**

There are many statistically significant coefficients in both equations. However, there is little difference between the two equations for these coefficients. The coefficient for the instrumented coinsurance rate is more than four times larger (more negative) in magnitude than the coefficient for the actual coinsurance rate, but these coefficients are not statistically different from each other (or from zero). The finding that the coefficient for the actual insurance rate is

not significantly different from zero provides some suggestive support for the possibility of employer-side selection, as selection on the part of workers would most likely make the coefficient more negative.

An equation was estimated for the log of the number of visits for persons who have some use. Since this equation was only for users, the sample was much smaller ($N = 163$). Most likely for this reason, there was little in the way of statistically significant results, and these results are not presented here.

Discussion

Keeler et al.[1] note that there are several difficulties that limit the inferences that can be drawn from non-experimental research on cost sharing and the use of mental health services: 'self-selection bias, unrepresentative samples, insurance plan complexity, and confounding influences of other factors affecting use'. Because the NMES is nationally representative, concerns about non-representative samples are minimized. However, issues surrounding plan complexity and selection remain, and, while the survey provides a wealth of data on sampled persons, not all measures provide the ideal level of specificity and detail.

Some selection effects, such as being employed in the labor force and being enrolled in an HMO, were beyond the scope of this analysis. However, this exercise attempted to explore selection effects related to the coinsurance rate faced by a family for ambulatory mental health services. The results presented here suggest that while most of the discussion of selection is phrased in terms of probable users selecting higher levels of mental health insurance in their employment relation (see, for example, an article by Manning and Frank[18]), a negative form of selection in the labor market should not be ignored, where persons who would be likely users are presented with employment opportunities that limit their insurance choices. In other words, in the market for employer-based health insurance, selection may be both a demand-side and a supply-side effect.

Using the actual coinsurance rates resulted in lackluster (not significantly different from zero) estimates of the effects of coinsurance on use. This result is counter to the stronger results that would be expected if one believed that only demand-side selection was at work, with workers expecting high family use choosing plans with low coinsurance, as such a situation would tend to bias the estimated coefficient way from zero. In addition, while the instrumental equation estimated for the coinsurance rate was not intended to provide structural estimates of the workings of the health insurance dimension of labor market choice, it also suggests the presence of supply-side selection.

Empirical research has shown that there is a relationship between earnings, employment and health, including mental health specifically.[19–21] While a prospective employer would not in most instances be assumed to observe such mental distress directly, such information might be embodied in lower productivity, poorer attendance and/or weaker references from previous jobs that would be observable. As

Table 3. Probability of specialty ambulatory mental health use ($N = 4541$)

Variable	Equation A w/actual coinsurance rate		Equation B 2/instrument for coinsurance	
	Coefficient	Standard error	Coefficient	Standard error
Coinsurance rate	−0.0020	0.0013	−0.0092	0.0067
Constant	−7.688***	1.411	−6.888***	1.590
Female	0.358***	0.098	0.367***	0.098
Black	−0.695***	0.248	−0.695***	0.247
Hispanic	−0.469*	0.269	−0.477*	0.269
Other	−0.941*	0.497	−0.961**	0.495
Age	0.161***	0.032	0.159***	0.032
Age squared/100	−0.201***	0.038	−0.199***	0.038
High school or some coll.	0.197	0.148	0.166	0.150
College diploma	0.382**	0.172	0.345**	0.176
Post-college	0.518***	0.173	0.514***	0.174
MH index	0.036***	0.010	0.037***	0.010
MH index missing	0.680***	0.181	0.703***	0.183
MH index non-key	0.060***	0.008	0.058***	0.009
MH index non-key missing	0.410***	0.147	0.402***	0.147
ADLs	−0.622	0.757	−0.693	0.760
IADLS	0.858**	0.414	0.941**	0.419
Family size	−0.140***	0.038	−0.137***	0.038
Log (income)	−0.018	0.053	−0.039	0.057
Psych/pop in county	0.181	0.426	0.151	0.427
Median county schooling	0.198**	0.099	0.185*	0.100
NC	0.206*	0.118	0.167	0.123
South	−0.157	0.123	−0.175	0.124
West	0.175	0.131	0.159	0.131
Log-likelihood	−602.9		−603.0	

* Statistically significant at 0.10 level, two-tailed test.
** Statistically significant at 0.05 level, two-tailed test.
*** Statistically significant at 0.01 level, two-tailed test.

a result, the coefficient for the mental health index for the key worker in the instrumental equation may reflect the canceling out of these opposing effects. However, if there is a significant need for mental health care on the part of another family member, this need can lead to choosing a plan with a lower coinsurance rate without the countervailing selection effects in the labor market.

The data used are from 1987 (the most recent year for which such detailed and representative American data will be available for several years), and therefore do not reflect the increased involvement of managed care organizations in the US health care sector. However, there is little basis for believing that these shifts have altered the qualitative relationships that are explored here, namely the non-random sorting of workers with regard to expected use, employment and employment-based mental health coverage.

One should also note that this exercise did not attempt to model full plan complexity. Manning and Frank[18] discuss techniques for estimating demand that incorporate substantial elements of coverage complexity, but also note the several difficult problems with applying these approaches, especially for ambulatory mental health care where the vast majority of persons have zero use but a small percentage have very high use. In any event, data were not available for most other provisions that would apply to mental health care. An attempt was made to construct a 'deductible' variable for

this analysis from the Health Insurance Provider data. The analyses that used this variable, not presented here, showed that the deductible had no statistically significant effect on use, and the coefficients for the mental health outpatient coinsurance rate were unchanged. Such a result is plausible given that the deductible generally applies to all health care use, not just to specialty ambulatory mental health treatment specifically.

This analysis indicates that caution needs to be used in making estimates of the effects of broad-based changes in insurance coverage for ambulatory mental health care, such as might occur in legislation mandating parity in mental health benefits or in broad-based health care reform. Even if one uses assumptions about the responsiveness of demand that are accurately derived from a true experiment, in the real world the initial positions of persons are not randomly assigned. Given the results presented here, it appears that for some persons this would result in overestimates of changes in use, while for others it would result in underestimates. There is no strong reason to assume that these would cancel out overall, and certainly not for specific sub-groups that may be of policy interest.

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