

# Financial Burden and Out-of-Pocket Expenditures for Mental Health across Different Socioeconomic Groups: Results from HealthCare for Communities

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## Abstract

**Background:** Mental health benefits have traditionally been much less generous than benefits for physical health care, with separate deductibles, higher copayments or coinsurance, and lower limits on covered services, a trend that continues despite a recent wave of “parity” legislation. In spite of the current policy debates on mental health insurance reforms, little is known about the burden of mental health out-of-pocket expenditures.

**Aims:** This study examines differences in out-of-pocket expenditures and their burden across different populations, stratified by insurance status, age, ethnicity, and socioeconomic groups.

**Methods:** This study uses the 1998 HealthCare for Communities household survey, the latest national survey data that are currently available, to measure the burden of out-of-pocket mental health expenditures. We use several measures of burden such as total out-of-pocket expenditures, their share of total treatment costs, and their share of family income. To address the methodological issues that arise in the calculation of the relative measures of burden (e.g. outliers, measurement error, systematic underreporting) we consider three different approaches that have been suggested in the literature and discuss their relative advantages given the type of data typically available.

**Results:** Although there is a common perception that out-of-pocket expenditures for mental health services represent a significant burden for service users, the estimates suggest that this is not the case. In fact, across the three measures of out-of-pocket expenditures as a share of income the estimates are under 10 percent for most groups. However, there is some variation in burden across groups with people who are older, uninsured, or minority spending a larger share of their income out-of-pocket. Since many insurance plans have limits on the number of visits covered and on the total amount that the insurer will pay for mental health services, the share of total mental health expenditures that are paid by individuals is another important measure of the burden faced by people with mental health service needs. We estimate that the mean out-of-pocket share of total expenditures for the group as a whole is 25 percent. In addition, we find that the

burden varies across groups with older, more educated, or privately insured individuals paying a larger share of expenditures out-of-pocket.

**Discussion:** Although the overall picture regarding the burden of out-of-pocket costs relative to income is encouraging, it is also important to keep in mind that individuals make treatment decisions based on their available income. The fact that the burden of actual out-of-pocket payments is relatively low may also reflect decisions to forego potentially valuable care. Nevertheless, the results for mental health do not suggest that out-of-pocket costs are currently a major burden for most users. This situation may reflect a major change from the past given the recent shifts towards managed care, however there are no comparable data available to test this hypothesis empirically.

**Implications for Policy and Research:** It may be tempting to attribute the low estimates of out-of-pocket expenditures as a share of income in this paper to recent parity legislation. However, recent research shows that parity legislation has not led to significant changes in benefit design. In fact the high ratio of out-of-pocket payments relative to total mental health care expenditures presented in this paper are consistent with a limited role of parity legislation. Another possible explanation for the observed results is the growth of managed care and the shift in treatment style towards greater use of medications, which are comprehensively covered in most private insurance plans, has reduced total treatment costs and consequently the size of out-of-pocket payments.

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## Introduction

Mental health benefits have traditionally been much less generous than benefits for physical health care, with separate deductibles, higher copayments or coinsurance, and lower limits on covered services, a trend that continues despite a recent wave of “parity” legislation.<sup>1,2</sup> In spite of the current policy debates on mental health insurance reforms, we know little about the burden of mental health out-of-pocket expenditures. There are some estimates in the literature on the effects of policy on mental health out-of-pocket. Zuvekas and

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colleagues have simulated the effects of parity on out-of-pocket expenditures based on data collected in the 1980s.<sup>3-5</sup> More recently, Zuvekas estimated the burden of out-of-pocket payments for mental health services. His study found that out-of-pocket expenditures account for about one-fourth of total mental health expenditures in 1996.<sup>6</sup>

Total out-of-pocket expenditures or their share of total treatment costs, however, do not provide information about the financial burden relative to family income. Consequently to expand upon the prior research, we present estimates of out-of-pocket mental health expenditures as a share of income, a measure that has been used in prior studies of the financial burden associated with physical health care.<sup>7-9</sup> In addition, we restrict our sample to include only individuals who used mental health services in the previous year and who have a probable mental health diagnosis. This restriction allows us to focus on the financial burden faced by individuals who have a demonstrated need for services.\*

This study uses the latest national survey data that are currently available, the 1998 HealthCare for Communities household survey, to examine differences in out-of-pocket expenditures and their burden across different populations, stratified by insurance status, age, ethnicity, and socioeconomic groups. We provide several different estimates of the burden of out-of-pocket mental health expenditures. Our results are quite similar to Zuvekas' findings on the share of mental health treatment costs paid out-of-pocket.<sup>6</sup> In addition, we find that overall the burden of out-of-pocket expenditures relative to income is relatively small.

New data are particularly important for this analysis because mental health care has experienced dramatic changes in the past decade with the introduction of new medications, an emphasis on time-limited goal-oriented therapies, and the growth of managed care, especially through behavioral health carve-outs.<sup>10</sup> The introduction of managed care in mental health is associated with a substantial drop in expenditures, even when benefits become more generous.<sup>11-15</sup> All these changes are likely to have reduced out-of-pocket expenditures for treatments of comparable effectiveness and may also have shifted the out-of-pocket burden across different socioeconomic groups.<sup>16</sup>

It is important to look at the burden estimates across different subgroups as general population data may obscure trends that disproportionately affect vulnerable subgroups. For example, privately insured individuals commonly have comprehensive medication coverage, but elderly individuals under Medicare do not. Moreover the growth of managed care, more restrictive benefits, or higher cost-sharing may have substantially different effects on across racial/ethnic groups. In a recent study of access to general medical care among the privately insured, the effect of being in an Health Maintenance Organization (HMO) on access to care, as measured by extent of financial barriers, was strongest among minority groups.<sup>17</sup>

\* It is important to keep in mind that there is substantial unmet need for services. Estimates from the HCC indicate that approximately 74 percent of people with a probable mental health diagnosis do not receive any services. Similarly, there are a substantial number of people who use services that have no observed need. Nearly 40 percent of people who report using mental health services in the HCC do not have a probable mental health diagnosis.

For the elderly, Gross analyzed the burden of out-of-pocket expenditures for general medical care in relationship to income and finds that out-of-pocket expenditures as a share of income increase as income falls.<sup>8</sup> For mental health, however, there is very little information on how the out-of-pocket expenditures compare to income across different population subgroups. There is more information on out-of-pocket mental health expenditures as a share of total treatment costs. Zuvekas estimates that in 1996 minorities, low-income people, and the publicly insured paid a smaller share of treatment costs out-of-pocket than did white people, high-income people, and the privately insured, respectively.<sup>6</sup> All of these findings indicate the importance of looking at measures of burden for different subgroups of the population.

While conceptually straightforward, estimating the ratio of out-of-pocket payments relative to income or total treatment expenditures raises an important methodological issue. The methodological challenge arises out of the fact that the distribution of mental health out-of-pocket expenditures and income (or total treatment costs) are highly skewed and measured with error. As a consequence, methods that theoretically should yield identical or at least very similar estimates of burden could in practice yield widely differing numbers. The problem occurs because variables that are based on ratios can be sensitive to measurement error, especially extreme outliers. We consider three approaches for calculating share estimates that have been suggested in the literature and discuss their relative advantages given the type of data typically available.

## Data and Methods

The data come from HealthCare for Communities wave 1 (HCC-1), a national survey fielded in 1998 and funded by the Robert Wood Johnson Foundation.<sup>18</sup> HCC was designed to identify variations and track changes over time in healthcare, with a primary focus on issues related to alcohol, drugs, and mental health. The HCC-1 household survey is closely tied to the household survey component of the Community Tracking Study (CTS).<sup>19</sup> The HCC-1 household sample was selected from adult (age 18 and above) CTS telephone respondents. Information from the CTS was used so that HCC-1 could oversample low-income respondents, individuals who reported using specialty mental health services in the last year, and individuals who reported high psychological distress. The final sample includes 9,585 individuals. Weights to adjust for the sampling design and non-response were developed to obtain nationally representative estimates.\* A detailed description of the study design has been published in Sturm, Gresenz, Sherbourne, et al.<sup>18</sup>

Because HCC focuses on issues related to alcohol, drugs,

\* Weighted estimates from the HCC are similar to estimates from the CPS regarding the distribution of the population across different insurance types and income groups. The percent privately insured in HCC is somewhat lower than in the CPS. However, the published insurance status tables included all age groups, not just adults. The median income in the HCC is \$38,500 as compared to census estimates of \$38,885 for 1998.

and mental health, the survey data includes detailed information on the utilization of substance abuse and mental health services. In addition to the information on utilization, the HCC survey also collects clinical information about mental health status and about expenditures made for mental health and substance abuse services.

From this information we construct three basic measures describing the burden of out-of-pocket mental health expenditures among service users. These measures are:

- (i) Out-of-pocket costs (oop)
- (ii) Out-of-pocket as fraction of total family income
- (iii) Out-of-pocket as a fraction of total mental health or substance abuse expenditures
- (iv) Percent of sample with significant burden\*

Mental health out-of-pocket costs in the HCC include money spent by the respondent and his/her family in the past year on mental health or substance abuse treatment for the respondent. Income is measured as family income, which includes earnings from work, retirement and disability income, cash transfers from means tested government programs, unemployment benefits, alimony, child support, and other miscellaneous sources of income. To improve total family income estimates, each major component of income was asked about separately, and respondents were asked to respond with actual dollar amounts. Unfolding follow-up brackets were adopted to reduce item non-response; individuals who refused or could not estimate specific amounts were asked a sequence of questions about whether income was greater or less than certain amounts.<sup>20</sup> Respondents' answers to the follow up questions were used to improve imputation, which was conducted separately by major income component.

Measurement error, primarily due to misreporting, is one of the main concerns for this analysis. As noted previously, misreporting of family income was minimized in the HCC-1 by asking about separate components individually and by using unfolding brackets to reduce non-response. However, the respondent may not necessarily be the most informed person to answer those questions. The same applies to out-of-pocket costs for mental health treatment, although this is a relatively simple concept and one would assume that the patient is relatively well informed about this issue. In addition, misreporting may occur due to recall bias as the respondents are asked to provide information on income and expenditures for the previous year.

The calculation of total mental health treatment costs is complicated and it would be unreasonable to expect survey respondents to report such costs accurately. In fact, the best one could reasonably expect is to have respondents provide information regarding charges and this would only be possible in situations where patients actually receive a bill. Therefore, we believe that the imputed total treatment expenditures are

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\* When looking at income, a person is said to face a significant burden if he/she spends more than 20 percent of income on out-of-pocket mental health expenditures. When looking at mental health expenditures, a person is said to have significant burden if he/she pays more than 50 percent of his/her total mental health treatment costs out-of-pocket.

preferable even though the imputation procedure introduces measurement error to the extent that payments for identical services differ across patients.

Total mental health expenditures for the individual are estimated based on detailed utilization data in the HCC-1, which assessed specialty visits, primary care visits for mental health reasons, residential stays, emergency room visits, inpatient stays, and prescription drugs. The utilization data is combined with estimated costs per service to obtain an estimate of total mental health treatment expenditures. The estimates of costs per service are garnered from a number of sources. Data from Ingenix, a proprietary data base of private health claims for 1.5 million employees and dependents, are used to estimate the average cost of a specialty mental health visit for the privately insured and the uninsured. For those that are publicly insured we use the Medicare reimbursement rate, based on CPT code 90806, to estimate the cost of a specialty mental health visit.\* For primary care and emergency room visits Medicare reimbursement rates are used to estimate the average cost per service for all insurance categories (CPT codes 99214 and 99284, respectively). The estimates of the cost per night of inpatient mental health stays and residential treatment are based on administrative data from United Behavioral Health published in Sturm, Goldman, and McCulloch.<sup>21</sup> The average cost per service estimates are reported in **Table 1**.

To obtain individual-level estimates of the cost of psychotropic drugs, medications reported by HCC respondents were matched by drug name to four data sources, each with a different type of cost data. In order of decreasing preference, these data sources are Ingenix (transaction cost data), FirstDatabank (average wholesale price data), Dietary Supplement Database (survey of traditional and Internet retailers), and Internet sources (survey of Internet retailers). If a match with the Ingenix data was not possible, a match with FirstDatabank was preferred, and so on. After the cost data were merged into the individual-level data, average daily drug cost and months prescribed were combined to estimate the cost per drug for each person. Then for each individual, the total cost of all psychotropic drugs was calculated by summing the estimated cost for each drug taken.

As noted above, our analysis focuses on the out-of-pocket mental health expenditures among those people using mental health services who have an observed need. From a policy perspective, we believe that this sample restriction is very important. Clearly, policy makers are concerned about the financial burden that people with mental health needs incur in obtaining needed services. It is not clear that they should be concerned about those individuals who use services, but have no probable diagnosis.

The HCC screens individuals for symptoms of depression,

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\* We use Medicare reimbursement rates for all publicly insured individuals in the sample in part because Medicaid payments for and coverage of mental health services may vary across states. Using Medicare reimbursement rates for the costs of services provided to Medicaid recipients introduces measurement error into the calculation. However, based on the data from Ingenix and the Medicare CPT codes there does not appear to be a great deal of variation in costs across insurance types, which may suggest that using the Medicare reimbursement rates for all publicly insured individuals is likely not a serious problem.

Table 1. Estimates of average cost per service

Service	Average Cost per service	Source
Specialty mental health visit - privately insured and uninsured	\$ 100	Ingenix
Specialty mental health visit - publicly insured	\$ 96	Medicare CPT code 90806
Primary care visit	\$ 58	Medicare CPT code 99214
Emergency room visit	\$ 101	Medicare CPT code 99284
Inpatient night	\$ 470	Sturm, Goldman, & McCulloch (1998)
Residential treatment night	\$ 250	Sturm, Goldman, & McCulloch (1998)

\*Unless noted, estimates are used for all insurance categories.

dysthymia, generalized anxiety disorder, schizophrenia, panic disorders, and bipolar disorder. If an individual has a probable diagnosis for any of these disorders and they have used mental health services in the prior year they are included in the sample for analysis. Since there are people who use mental health services who do not have a probable mental health diagnosis, restricting the sample in this way reduces the number of observations. In the HCC there are 1,014 people that report seeing a doctor for mental health services, of which 622 have a probable mental health diagnosis. Although the smaller sample size makes it infeasible to make comparisons across some sub-groups, we feel that the benefits of the sample restriction outweigh the costs.

### Data Analytic Procedures

Our main approach is to provide descriptive statistics stratified by population groups, in particular by age, insurance status, ethnicity, education, gender, and family income. The main issue is how to deal with dependent variables that are ratios of two different concepts.

The analysis of actual out-of-pocket expenditures on mental health and substance abuse services is straightforward. However, it is not a strong measure of burden, as it does not reflect an individual's ability to pay. Measures such as out-of-pocket mental health expenditures as a fraction of total family income and as a fraction of total mental health treatment costs are more informative. However, as noted before, an important methodological issue arises in calculating these ratios. The most obvious way to calculate these ratios is at the individual level as an average cost share. Focusing on the out-of-pocket share of income, the measure of burden is the average across individuals of the ratio of out-of-pocket spending on mental health and substance abuse services to income. If  $OOP_i$  represents an individual's out-of-pocket expenditures,  $Y_i$  represents total family income, and  $n$  is the number of people in the sample then the average out-of-pocket cost share can be calculated as follows.

$$OOP\ Share = \frac{1}{n} \sum_{i=1}^n \frac{OOP_i}{Y_i} \quad (1)$$

This calculation, however, can be problematic for a number of reasons. First, the distributions of mental health out-of-pocket expenditures and income are both highly skewed and this simple approach may not work well when bias and misreporting exist.<sup>22</sup> In particular, the method of calculating burden outlined above is very sensitive to outliers. As an example, in survey data the situation may arise where for some individuals the ratio of out-of-pocket expenditures to income is greater than one. While this is not impossible, for example, when individuals borrow to pay for care, many of these cases are due misreporting or measurement error. One simple approach that has been advocated is to censor the individual ratios at one.<sup>8</sup> This adjustment for shares greater than one will reduce the estimate of the burden of out-of-pocket expenses. The censored out-of-pocket share of income is calculated as follows

$$Censored\ OOP\ Share = \frac{1}{n} \sum_{i=1}^n \min\left(\frac{OOP_i}{Y_i}, 1\right) \quad (2)$$

This censoring is not unbiased because a ratio over one will be accurate for some people. In fact, this approach could potentially exacerbate biases.

An alternative measure of burden that is less affected by outliers was suggested by Goldman and Smith in their analysis of the burden of out-of-pocket medical expenditures among the elderly (equation 3).<sup>22</sup> This measure calculates the burden as the ratio of average mental health out-of-pocket costs to average family income.

$$\overline{OOP\ Share} = \frac{\frac{1}{n} \sum_{i=1}^n OOP_i}{\frac{1}{n} \sum_{i=1}^n Y_i} \quad (3)$$

Goldman and Smith argue that the aggregate measure eliminates the problem of random measurement error and reduces biases associated with underreporting.<sup>22</sup> Zuvekas appears to use this approach to calculate the ratio of out-of-pocket to total treatment payments for different population

subgroups.<sup>6</sup> However, Alexchik et al argue that the alternative measure (3) does not provide a better estimate of burden and may bias the burden estimate downward because it places too much weight on individuals with high incomes<sup>23</sup>

It is likely that in addition to income misreporting, mental health out-of-pocket expenditures are reported with error as well. While there is relatively clear evidence that income is underreported in survey data, there is no conclusive evidence on whether out-of-pocket expenditures are systematically over or under reported in survey data. The extent of misreporting of out-of-pocket will determine whether the burden estimates are biased up or down. Under the assumption that the level of underreporting is constant across individuals it can be shown that the magnitude and the direction of the underreporting bias is determined by the level of underreporting of out-of-pocket mental health expenditures (call this,  $U_o$ ) relative to the level of income underreporting (call this,  $U_i$ ).\*

If the ratio,  $U_o/U_i$ , is less than one then the calculated burden will underestimate the true burden of out-of-pocket expenditures. On the other hand, if the ratio is greater than one, the burden will be overstated. The bias will disappear if the extent of misreporting is the same for income and out-of-pocket ( $U_o=U_i$ ). Thus, the bias of the share estimate will be dependent on the relative magnitude of misreporting in out-of-pocket expenditures and income. Unfortunately, there is no evidence on the relative sizes of misreporting. However, to the extent that  $U_o$  and  $U_i$  remain relatively constant across groups, comparisons across groups remain valid even if the total estimates of burden are biased.

The same issues and limitations arise when estimating the share of mental health expenditures that are paid out-of-pocket, with one exception: the censoring at 1 is now correct and not a source of bias.

Other measures of the magnitude of the financial burden associated with out-of-pocket medical expenditures have been used. In a recent study, Taylor et al report estimates of the share of people whose out-of-pocket payments for medical care represent a significant burden.<sup>7</sup> In our analysis, we apply this same type of burden measure to out-of-pocket mental health expenditures.

## Results

### *Out-of-Pocket Expenditures on Mental Health*

Descriptive statistics for mental health out-of-pocket expenditures are presented for all users of mental health services and for subgroups of users in **Table 2**. The estimates indicate that the distribution of mental health out-of-pocket expenditures is quite skewed among users. The median value of \$160 for out-of-pocket expenses is much lower than the

\* The level of underreporting,  $U_i$ , measures the fraction of the true level that is reported. Taking income as an example, the relationship between the reported and true levels can be summarized by the following equation:  $I^{reported} = U_i * I^{true}$ . Thus, a value of  $U_i = 0.8$  is interpreted to mean that people report on 80 percent of their actual income.

mean of \$891. When the distribution of a variable is highly skewed, the median can be a better measure of the central tendency, especially if extremely high values represent coding errors or misreporting. In making comparisons across groups, we therefore focus on the median value of mental health out-of-pocket expenditures for each subgroup. On the whole, median out-of-pocket expenditures on mental health appear to be relatively low.

Looking across the subgroups of the population some interesting patterns emerge. First, the uninsured group has the highest median out-of-pocket expenditures of all the insurance status groups.\* This is not unexpected because these individuals would be expected to pay the full cost of any mental health services they receive, although some free care is available through charity organizations or free clinics. The descriptive statistics also indicate that the median out-of-pocket expenditure on mental health is higher for whites than for minorities (\$200 vs. \$100).†

Differences are also seen across income quartile groups. In general, median out-of-pocket expenditures increase with income. However, the highest out-of-pocket expenditures are found in the second quartile of the income distribution. The median expenditure for the lowest income quartile group is \$50 and grows to \$200 for the highest income group. The median out-of-pocket for second income quartile is the highest at \$300.

It is important to keep in mind that the absolute magnitude of the mental health out-of-pocket expenditures reflects a number of factors. Out-of-pocket expenditures are determined by both insurance characteristics and the intensity of mental health service utilization. Thus, a group may have high out-of-pocket expenditures because they use more services than other groups do or because they have less generous insurance coverage or perhaps some combination of both of these reasons.

Focusing only on measures of the average or median financial burden that mental health service users face may hide significant financial burdens faced by some service users. In **Table 2**, we provide additional information about the distribution of out-of-pocket expenditures across the sample, the out-of-pocket expenditure at the 90<sup>th</sup> percentile of the distribution. These estimates reflect the burden faced by people at the high tail of the out-of-pocket distribution. Across the whole sample, the out-of-pocket expenditure at the 90<sup>th</sup> percentile is \$2000. Looking across sub-groups we find that

\* Although we report estimates for four insurance status categories, some of the results must be interpreted with caution. Due to the sample restrictions, there are only a small number of people the Medicare, Medicaid, and uninsured categories (77, 52, and 71, respectively). As a result, the estimates for these groups are somewhat less precise. In addition, for this analysis, insurance status reflects the individual's current insurance coverage. Since the utilization information is reported for the previous year, some of the reported services may have been obtained under a different insurance status. For example, some of the people who are currently uninsured may have had coverage at some point during the year and obtained their mental health services under that plan.

† While the HCC includes a more detailed breakdown by race, the sample size for specific minority groups when focusing on mental health service users is too small to produce precise estimates. Consequently, we combine all minority groups into one group. We then present all estimates for whites and minorities separately.

Table 2. Descriptive statistics mental health service users with probable mental health diagnosis

	Unweighted Number of Observations	(1) Mean MH OOP	(2) Median MH OOP	(3) 90 <sup>th</sup> Percentile of OOP Distribution	(4) Mean MH Expenditures
Overall	622	891	160	2000	3616
<b>Insurance Status*</b>					
Privately insured	402	690	200	2000	2196
Medicare	77	1486	100	1500	5678
Medicaid	52	481	0	3000	8144
Uninsured	71	1514	300	4000	4191
<b>Age</b>					
<35	183	827	125	3000	3437
35 to 49	298	722	200	1500	3602
50 +	141	1310	160	2000	3878
<b>Race/ethnicity</b>					
White	843	788	200	1600	3476
Minority	114	1205	100	3000	4043
<b>Education</b>					
High school graduate or less	288	763	100	1500	4722
Some college	176	720	150	2500	2845
College graduate	158	1398	300	3000	2397
<b>Gender</b>					
Male	185	983	100	1500	4842
Female	437	843	200	2800	2980
<b>Income Quartile</b>					
Quartile 1 (lowest)	195	792	50	2000	5505
Quartile 2	144	1302	300	4000	3215
Quartile 3	142	494	150	1500	2569
Quartile 4 (highest)	141	1034	200	3000	2217

\*The 20 individuals in the sample with public insurance other than Medicare and Medicaid are not included in any of these insurance status categories.

while the pattern in the medians is replicated for the income quartile and insurance groups, we see the opposite result for whites and minorities. At the upper tail of the distribution, out-of-pocket expenditures of minorities are higher than for whites (\$3000 vs. \$1600, respectively). Taken together these estimates highlight the important fact that there are some mental health service users that pay a significant amount out-of-pocket for needed services.

### *Out-of-Pocket Expenditures on Mental Health as a Share of Income*

**Table 3** contains estimates of several measures of out-of-pocket expenditures as a share of income. There is a common perception that out-of-pocket expenditures for mental health services represent a significant burden for most service users; however, the estimates suggest that this is not the case. In fact, across the three share measures in **Table 3** the burden is under 10 percent for most groups. Based on the aggregate measure

of burden (column 3), the proportion of income spent on mental health is even lower, under 5 percent, for all but one of the population sub-groups. For mental health users as a whole, the aggregate out-of-pocket share of income is approximately 2 percent. In addition, across the whole sample only about 5 percent face out-of-pocket mental expenditures that represent more than one-fifth of their income. This calculation is based on the individual-level measures of out-of-pocket as a share of income. To the extent that some of the outliers at the upper end of the distribution are due to measurement error or misreporting, this measure may overstate the share of service users facing a significant financial burden.

The differing results from the three methods of measuring out-of-pocket expenditures as a share of income reflect the methodological problems identified above. Comparing across columns (1) and (2), we see that the mean out-of-pocket share of income is quite sensitive to outliers. When we censor the value of the out-of-pocket share of income with a maximum value of one, the burden estimate for most sub-groups falls

Table 3. Measures of out-of-pocket mental health expenditures as a share of income mental health service users with probable mental health diagnosis

	(1) Mean OOPshare of income	(2) Censored OOP share of Income	(3) $\Sigma$ MH OOP/ $\Sigma$ Income	(4) Percent of people with significant burden*
Overall	0.075	0.040	0.021	4.8%
Insurance Status**				
Privately insured	0.033	0.031	0.013	5.2%
Medicare	0.177	0.044	0.059	2.9%
Medicaid	0.087	0.018	0.015	0.8%
Uninsured	0.138	0.086	0.047	8.1%
Age				
<35	0.068	0.037	0.020	4.5%
35 to 49	0.034	0.032	0.015	2.5%
50 +	0.165	0.059	0.043	9.6%
Race/ethnicity				
White	0.070	0.036	0.019	5.0%
Minority	0.091	0.053	0.030	4.1%
Education				
High school graduate or less	0.114	0.041	0.025	3.7%
Some college	0.047	0.043	0.018	6.3%
College graduate	0.033	0.033	0.020	4.9%
Gender				
Male	0.064	0.040	0.022	3.9%
Female	0.081	0.040	0.021	5.2%
Income Quartile				
Quartile 1 (lowest)	0.182	0.076	0.075	11.8%
Quartile 2	0.046	0.046	0.047	3.8%
Quartile 3	0.010	0.010	0.010	0.0%
Quartile 4 (highest)	0.008	0.008	0.010	0.0%

\* High burden is defined as spending greater than 20 percent of family income on out-of-pocket mental health costs.

\*\* The 20 individuals in the sample with public insurance other than Medicare and Medicaid are not included in any of these insurance status categories.

significantly. This result is seen most dramatically for the publicly insured and the lowest income quartile groups. Censoring reduces the share estimates for these groups by approximately 60 to 75 percent. Interestingly, all of the people for whom the out-of-pocket share of income is greater than one are in the lowest income quartile. Since low income individuals are the most likely to have out-of-pocket expenditures that are greater than their income, this result suggests that censoring at one may be inappropriate. Although it seems plausible that expenditures could exceed income for the poor, these results must be interpreted carefully. Goldman and Smith show that the out-of-pocket share estimate for medical care among the elderly is more biased for low income groups due to greater misreporting and measurement error in income.<sup>22</sup>

In most cases, the aggregate share measure reduces the estimates of burden below the censored mean measure. This result reflects the fact that the aggregate share measure is not biased by random measurement error. Looking across

subgroups, some of the patterns that are observed in the absolute measure of out-of-pocket expenditures are not present in the share estimates. For example, the difference in the median out-of-pocket expenditure between whites and minorities goes the other way when the ability to pay is taken into account. The aggregate share measure indicates that minorities with probable mental health diagnoses pay 3 percent of their family income on out-of-pocket mental health expenditures as compared to whites who pay approximately 2 percent. Some interesting differences are also seen across insurance status groups. While the median out-of-pocket expenditure for the publicly insured was much lower than for the other insurance groups, the aggregate share estimate for Medicare recipients is relatively high. Medicare recipients and the uninsured pay between 4 and 5 percent of their income on mental health services. In contrast, the aggregate share estimates for the privately insured and Medicaid recipients are about 1 percent. In addition, a comparison across income quartiles shows that while median out-of-pocket expenditures increase with income,

Table 4. Measures of out-of-pocket mental health expenditures as a share of total mental health service users with probable mental health diagnosis

	(1) Mean OOP share of total MH Expenditures	(2) Censored OOP share of MH Expenditures	(3) $\Sigma$ MH OOP/ $\Sigma$ MH Exp	(4) Percent of people with significant burden*
Overall	0.529	0.274	0.246	22.7%
Insurance Status**				
Privately insured	0.579	0.300	0.314	25.9%
Medicare	0.375	0.194	0.262	16.1%
Medicaid	0.376	0.152	0.059	14.5%
Uninsured	0.643	0.364	0.361	25.6%
Age				
<35	0.468	0.284	0.240	23.9%
35 to 49	0.592	0.269	0.200	21.9%
50 +	0.484	0.270	0.338	22.8%
Race/ethnicity				
White	0.497	0.268	0.227	23.1%
Minority	0.624	0.291	0.298	21.5%
Education				
High school graduate or less	0.538	0.237	0.162	17.5%
Some college	0.445	0.293	0.253	25.5%
College graduate	0.627	0.323	0.583	29.9%
Gender				
Male	0.439	0.211	0.203	18.7%
Female	0.575	0.306	0.282	24.8%
Income Quartile				
Quartile 1 (lowest)	0.457	0.239	0.144	22.6%
Quartile 2	0.465	0.322	0.405	25.7%
Quartile 3	0.512	0.251	0.192	15.0%
Quartile 4 (highest)	0.733	0.301	0.468	28.2%

\*High burden is defined as paying for 50 percent or more of total mental health costs out-of-pocket.

\*\*The 20 individuals in the sample with public insurance other than Medicare and Medicaid are not included in any of these insurance status categories.

the aggregate share estimate declines as income increases. The aggregate share measure for the lowest income quartile is approximately 8 percent as compared to 1 percent for the highest income group. However, as noted before, the bias due to systematic under-reporting is larger for the lower income group. Thus, the difference between income groups must be interpreted with this in mind.

### *Out-of-Pocket Expenditures as a Share of Total Mental Health Treatment Costs*

The amount of money that an individual must pay out-of-pocket for mental health services is affected by the amount of services that are used. Many insurance plans have limits on the number of visits covered and on the total amount that the insurer will pay for mental health services. As such, the share of total mental

health expenditures that are paid by individuals is an important measure of the burden faced by people with mental health service needs. Three measures of the cost share paid out-of-pocket are presented in **Table 4**. The mean out-of-pocket share of total expenditures for the group as a whole is estimated to be 53 percent. This measure is quite sensitive to extreme outliers. Censoring the out-of-pocket share of expenditures at one for those who report out-of-pocket expenditures greater than the estimate of total costs reduces the estimate of burden by approximately 44 percent.

The aggregate share measure, presented in column (3), is similar to the censored mean share estimate, presented in column (2). This is in contrast to the results from the out-of-pocket share of income. A comparison of the aggregate burden estimates across subgroups of the population indicates that Medicaid recipients pay a much smaller share of their total



mental health costs out-of-pocket than do others. The burden of out-of-pocket expenditures relative to total treatment costs is 6 percent for Medicaid recipients while for the other groups it ranges between 26 and 36 percent. In contrast, the publicly insured pay about 15 percent of their total mental health costs out-of-pocket. Looking across income groups, the out-of-pocket share of total costs is highest for those in the top income quartile relative to the other income groups. The differences across income groups could reflect differences in the mix of services that are used. For example, high income individuals may be more likely to use psychotherapy, a mental health service that typically requires higher copayments. Similarly, college graduates appear to pay for a much larger share of their mental health services than do less educated groups. Taken together, these results could suggest that public insurance programs are more generous in their coverage of mental health services than private insurance plans are. It is important to keep in mind, however, that the numbers here are based only on those individuals who actually receive mental health services. There may be differences in access to services and in rates of unmet need across the insurance groups that are not reflected in these results. As such, it is difficult to say anything definitive about the relative generosity of different types of insurance from these results.

## Discussion

The estimated out-of-pocket share of total mental health expenditures of 25 percent found in this study is quite similar to estimates presented in Zuvekas.<sup>6</sup> The Zuvekas study finds that overall out-of-pocket expenditures represented 23 percent of mental health treatment costs in 1996. Moreover, we find similar patterns across subgroups of the population, with the publicly insured and low-income people paying a smaller portion of mental health treatment costs out-of-pocket than the privately insured and high-income people, respectively.

It is interesting to note that the out-of-pocket share of total expenditures appears to be substantially larger for mental health than for general medical care. A recent study shows that people who are full-year privately insured pay approximately 20 percent of their total medical care expenditures.<sup>7</sup> In comparison, we find that those who are currently covered by private insurance in the HCC pay approximately 31 percent of total mental health costs out-of-pocket.\* Similarly, other studies have found that Medicare beneficiaries pay 15 percent of their total medical expenditures out-of-pocket.<sup>9</sup> Our findings for Medicare recipients indicate that the out-of-pocket share of mental health expenditures is approximately 26 percent. This estimate is nearly two times higher than the out-of-pocket burden estimates in the literature for general medical care

\* The difference in the measurement of insurance status between these two estimates makes direct comparisons somewhat more difficult. It is possible that people in the HCC who are currently privately insured may have incurred out-of-pocket expenses for mental health services during a portion of the year when they were not covered by insurance.

among Medicare beneficiaries. The differences in out-of-pocket burden across mental health and physical health care are reflective of the disparity in generosity of coverage that is the focus of the push for mental health parity legislation.\*

One of the main contributions of this paper is that we are able to look at the burden of out-of-pocket expenditures for mental health relative to income. This measure provides important information about the financial burden that mental health service users face. Unlike the share of total treatment costs measure, the income share measure incorporates information on the individual's ability to pay for needed services. The estimates from this analysis tell a somewhat different story than the treatment cost shares discussed above. The burden of mental health out-of-pocket costs does not appear to be particularly high, even though our analysis is limited to users of mental health services with probable mental health diagnoses. Because we focus on service users with observed needs, the burden estimates are much higher than they would be if estimated for the general population or among all individuals with need some of whom are not using any services and thus have no out-of-pocket expenditures. Moreover, to further investigate this finding we looked at the aggregate share measure for individuals with a severe mental illness and found that the burden was relatively low even in this high utilization group.† The results indicate that on average this group spends about 4 percent of their income on out-of-pocket mental health expenditures.\*

In the model we prefer for methodological reasons, no subgroup of the sample spends as much 10 percent of their income out-of-pocket on mental health treatments and the average among all users in only 2 percent of income. In contrast, a previous study using the same methodology showed that on average Medicare recipients spent 13 percent of their income on medical services (which includes individuals with no chronic health problems) with the share increasing to as much as 25 percent for low-income individuals.<sup>22</sup>

While the overall picture regarding the burden of out-of-pocket costs relative to income is encouraging, it is also important to keep in mind that individuals make treatment decisions based on their available income. The fact that the burden of actual out-of-pocket payments is relatively low may also reflect decisions to forego potentially valuable care. Nevertheless, the results for mental health do not suggest that out-of-pocket costs are currently a major burden for most users. This situation may reflect a major change from the past, however, there are no comparative data available. It may be

\* The HCC does include information on out-of-pocket medical expenditures that could be used to generate estimates of the burden associated with general medical care. The question on out-of-pocket medical care, however, asks about total family expenditures on medical care for all family members in the past year where as the mental health out-of-pocket expenditures are reported for the individual respondent. As a result, the burden measures calculated using these two questions are not directly comparable. Therefore, we have chosen not to report these data, but rather to rely on previous estimates from the literature.

† An individual is said to have a serious mental illness if the clinical screeners indicate that the individual has a probable diagnosis of either a bipolar or a psychotic disorder.

\* These results are available from the authors upon request.

tempting to attribute this result to recent parity legislation, but the same survey data, as well as more recent employer survey data, show that parity legislation has not made significant changes in benefit design.

Another possible explanation for low out-of-pocket mental health expenditures relative to income would be that the growth of managed care and possibly a shift in treatment style towards greater use of medications, which is comprehensively covered in most private insurance plans, has reduced total treatment costs and consequently the size of out-of-pocket payments. This certainly happened among employers switching from unmanaged fee-for-service to carve-out managed care, however, it is not clear that this result is generalizable to the population level.<sup>8,10</sup>

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