

# The Role of Care Location in Diagnosis and Treatment of Pediatric Psychosocial Conditions

**ELOISE KAIZAR, M.S.**

*Department of Statistics, Carnegie Mellon University, Pittsburgh, Pennsylvania*

**DEENA CHISOLM, Ph.D.**

*Department of Pediatrics, The Ohio State University, Columbus, Ohio*

**HOWARD SELTMAN, M.D., Ph.D.**

*Department of Statistics, Carnegie Mellon University, Pittsburgh, Pennsylvania*

**JOEL GREENHOUSE, Ph.D.**

*Department of Statistics, Carnegie Mellon University, Pittsburgh, Pennsylvania*

**KELLY J. KELLEHER, M.D., M.P.H.**

*Department of Pediatrics, The Ohio State University, Columbus, Ohio*

---

**ABSTRACT.** Racial differences in diagnosis and treatment of psychosocial conditions have been well documented. It is unclear if these differences represent variance in prevalence or are actually disparities in care driven by social factors, income-related differences, or differences in the actual location of care. We used 4 years of National Ambulatory Medical Care Surveys and National Hospital Ambulatory Medical Care Surveys as source for data on visits to private offices and hospital-based clinics. In addition to the standard practice of combining surveys across years, we used a "supersurvey" approach to combining the 2 distinct surveys. In our roughly 20,000 sampled visits, we confirmed the higher concentration of low-income children in visits to hospital-based clinics ( $p < .001$ ), but saw no significant racial difference ( $p = .104$ ). After controlling for race, income, and other demographics, we found that visits to hospital-based clinics were significantly more likely to include a diagnosis of depression (odds ratio [OR], 4.4;  $p = .011$ ), but that there was no statistically significant difference in other psychosocial diagnoses. Once a diagnosis is made, there is no evidence of differences in treatment or follow-up between office-based or hospital clinic-based providers. Our analyses support previously gathered evidence for differences in economic status of the clientele of private offices and hospital-based clinics. We surprisingly found visits to clinics to be more likely to include a depression diagnosis, but this may be an artifact of the data reflecting visits rather than patients. We found no evidence that treatment or follow-up is different for the disadvantaged who use clinics rather than private offices. *J Dev Behav Pediatr* 27:219–225, 2006. Index terms: *location of care, psychosocial, survey, strata, disparity.*

---

Minority children have lower rates of mental health diagnosis and treatment than whites.<sup>1–4</sup> For example, studies conducted at the community level and national level consistently found lower rates of attention-deficit/hyperactivity disorder (ADHD) treatment in African Americans.<sup>5,6</sup> It remains unclear, however, whether these differences represent true underlying variance in prevalence or whether they are actually disparities in the delivery of care driven by social factors, such as culturally driven differences in attitudes toward child behavior<sup>7,8</sup> or income-related differences in access to care.<sup>9</sup>

Another possible explanation for disparities in the diagnosis and treatment of psychosocial conditions may be the location of service provision. To date, almost all of our information about primary care mental health services for children arises from studies of routine visits to office-based practices of primary care pediatricians and/or family physicians. It is unclear if this current knowledge adequately reflects health care for minority or poor children and their families with psychosocial problems. Although office-based visits (OBVs) account for the majority of outpatient care in the United States, minority and poor children are disproportionately served in hospital-based outpatient clinics, neighborhood health centers, and related institutional settings.<sup>10</sup> These settings are characterized by a greater reliance on nonphysician providers such as nurse clinicians,<sup>11</sup> along with a greater share of Medicaid and uninsured patients. Some authors<sup>12</sup> suggest that such differences in location of care may explain many of the disparities previously noted in the literature.

---

Received May 2005; accepted November 2005.

Address for reprints: Kelly J. Kelleher, M.D., M.P.H., Department of Pediatrics, The Ohio State University, Columbus, OH 43205; e-mail: KelleheK@pediatrics.ohio-state.edu.

This work was supported in part by grants from the NIH, MH65430 (E.K., H.S., J.G., and K.K.) and MHCRC30915 (J.G. and K.K.) and a grant from the NSF, no. DMS9819950 (E.K.).

It is not clear how location differences relate to variation in practice patterns. Increased reliance on nonphysician providers in hospital-based outpatient clinic visits (HBVs) may lead to increased use of counseling services and lower use of psychotropic drugs. In our sample, at least 23% (confidence interval [CI], 18–28%) of the HBVs did not include a consultation with a provider with prescriptive rights. HBVs may occur more often in the context of other comorbid conditions as compared with OBVs. Differential use of settings by population subgroups combined with differential patterns of care in those settings could help to explain disparities in diagnosis and treatment. This study focuses specifically on the impact of location of care on diagnosis and treatment of psychosocial problems asking 3 major questions.

1. What patient characteristics are associated with OBVs and HBVs?
2. Does the rate of diagnosis of mental health conditions vary by location of care?
3. Once a mental health diagnosis is made, does the use of psychotropic medications and counseling/psychotherapy or the scheduling of follow-up care vary by location?

We hypothesize that visits to institutional settings will involve more low-income and minority patients than visits to office settings. We also hypothesize that visits to these institutions will be more likely than visits to office-based practices to include a psychosocial diagnosis but, as a result of decreased contact with physicians and other providers with prescriptive rights, will be less likely to include prescriptions for psychotropic drugs and more likely to include counseling and, as a result of less continuous care, will be less likely to include scheduled follow-up for diagnosed patients.

## METHODS

### Source of Data

Data for primary care OBVs were drawn from the 4 National Ambulatory Medical Care Surveys (NAMCS), conducted between 1998 and 2001 by the National Center for Health Statistics. Physicians were chosen randomly according to a stratified design, information for which can be found elsewhere.<sup>13</sup> These physicians recorded various aspects of a systematic sample of visits to their offices during a 1-week period assigned to each physician so that data were collected throughout each year. Only visits by children aged 5 to 20 to physicians whose specialty is general practice, family practice, or pediatrics practicing in freestanding private offices, solo offices, group offices, clinics or urgent care centers; privately operated clinics; or health maintenance organizations were included in our study as OBVs.

Data for visits to institutional or hospital outpatient clinics (HBVs) were drawn from the outpatient department portion of the 4 National Hospital Ambulatory Medical Care Survey (NHAMCS), also conducted between 1998 and 2001 by the National Center for Health Statistics. In this survey, hospital outpatient departments were chosen

randomly according to a stratified design, information for which can be found elsewhere.<sup>14</sup> Whereas freestanding clinics were included in the OBV sample, only clinics that are hospital based were included in the HBV sample. These outpatient departments recorded various aspects of a systematic sample of visits to their clinics during a 1-month period assigned to each department so that data were collected throughout each year. Only visits by children aged 5 to 20 years to general medicine or pediatric clinics were included in our study as HBVs.

Because of the lack of patient and provider identification, 2 visits in the same survey or across the 2 surveys may represent the same patient and/or provider. However, the chance for this to happen is negligible. (If this happened frequently, it would bias the standard errors, but we considered this risk to be extremely small). It must also be noted that the sampling design of NAMCS did not explicitly sample visits to nonphysicians in office settings (e.g., nurse practitioners). However, visits to nonphysicians were actively sampled for NHAMCS.

### Variables

To measure the rate of diagnosis of mental health disorders, we created the variable, mental health diagnosis, which we defined as a visit in which any of the 3 recorded diagnoses fell into classes 292 to 314, as defined by the *International Classification of Diseases, Ninth Revision, Clinical Modification*. Approximately 14% (CI, 11–17%) of the visits included a mental health diagnosis. The most common of these were ADHD and depression, which comprised 58% and 17% of the population with at least 1 mental health diagnosis, respectively, with only 1% having been diagnosed with both of these most prevalent diseases.

Because treatment is a complex idea, we defined 3 separate variables to describe the care a patient received or was scheduled to receive:

- Psychotherapy is any visit that received mental health, stress management, growth/development, or tobacco use counseling, or received or was referred to psychotherapy.
- Psychopharmacotherapy is any visit that included a prescription for a psychotropic drug (classes 0600–0699, as classified by the survey's classification system).
- Follow-up is a visit with scheduled follow-up (including referrals, scheduled appointments, and hospital admittance).

In addition to the outcome variables of interest, we used independent variables, including patient demographics, expected payor, extent of illness (number of recorded diagnoses), visit type (acute/chronic/well), type of practitioner (physician, prescribing nonphysician, or nonprescribing nonphysician), and region of patient residence (Northeast, South, Midwest, or West). We also used the survey sampling design strata and primary sampling units (PSUs); the PSUs are physicians for NAMCS and hospitals for NHAMCS.

## Analysis

Because the sampling frames for the NAMCS and NHAMCS data sets do not overlap (i.e., a visit recorded in NAMCS could not also be recorded in NHAMCS), we considered the visits as if they were sampled from 1 large “supersurvey” that uses both OBVs and HBVs as its sampling frame. In this supersurvey, the first design element is a “superstratification” on the location of visit (office or hospital clinic). Thus, the selection of PSUs and further stratification within each superstratum were conducted independently of the other superstratum. Within each superstratum, we combined 4 years of data to create a larger sample size. Again, visits do not overlap between years and so can be considered simply as part of the design.

We performed adjusted  $\chi^2$  tests of independence between the location of the visit and each variable for each separate relationship using a design-based survey method (the *svytab* command in the Stata software package, College Station, TX).

We performed several series of logistic regressions that followed the progression of a patient through the health care system. We first modeled the relationship between the location of care and the demographic variables to characterize any visit-load disparities. Second, to discover any links between the location of care (OBV or HBV) and the probability of receiving a diagnosis while controlling for potential confounders (notably, race and poverty levels), we modeled the relationship between diagnosis of the patient and demographic variables, including location of care. In this step, we developed 3 models, one for any psychosocial diagnosis and one for each of the 2 most common disorders—ADHD (3.23%) and depression (0.91%). Third, to discover any links between the location of care and the probability of receiving psychotropic drugs or counseling, we modeled the relationship between treatment types and demographic variables within diagnosis groups. Finally, to discover any links between the location of care and the probability of receiving follow-up, we modeled the relationship between follow-up and demographic variables and treatment types within diagnosis groups.

Because the data were derived from a complex survey, model selection for regressions was not a trivial problem. We chose to select a model using statistical techniques usually applicable to experimental data (model-based methods) but including the design variables (here, the PSU and strata membership) as explanatory variables. However, we did all inference based on the parameter estimates derived using survey sampling methods (design-based methods). Lohr described this approach as model assisted.<sup>15</sup> For our application, doing an exhaustive search of all possible regression models to select the best model was not feasible, so we used a 2-stage model selection process with the Bayesian Information Criterion (BIC) as a selection criterion. In the first step, we fit all possible main-effect regression models (using the S-Plus software package, Seattle, WA). Of these, we selected the model with the smallest BIC value (indicating the best fit to the data) and all models that have a BIC within 2 points of the BIC for the best main-effects model. Then, for the second step, we

used forward-backward stepwise selection with BIC as the criterion to choose first-order interaction terms. Finally, we chose as our model the one with the lowest BIC for which there was good agreement between the model- and design-based estimation (the estimated odds ratios [ORs] and *p* values for the latter were found using design-based logistic regression [the *svylogit* command in the Stata software package]). Following Korn and Graubard, in the final selection, we took an agreement between the model-based parameter estimates and the design-based estimates to indicate a good model fit, whereas a lack of agreement could indicate that some key predictor has been omitted from the model.<sup>16</sup> We defined good agreement as agreement in the significance of all (for those models with only 1 predictor) or all but 1 of the effects that are not related to the region of the country or urban location. We discounted these 2 variables because they were used in construction of the survey design and sample weights, and so we would not expect there to be agreement in the 2 methods on the significance of these variables. Of the 12 regression models fitted using this process, 7 did not yield models that agreed; this was partly the result of small sample size allowing a small number of unusual observations to differentially affect the design- and model-based estimates.

We could not apply this model selection process to the regression of the location of the visit on all the demographics because the location of the visit was 1 of the variables used in the survey design. Therefore, we selected the model ad hoc. We chose the model that contained the main effects of all the demographics and the square of the centered age and fit it using design-based logistic regression (the *svylogit* command in the Stata software package). Approximately 4% of the observations were missing information on the expected source of payment; these were not used in the analyses.

## RESULTS

### Setting Use Characteristics

The data consisted of 5,252 OBVs and 14,754 HBVs (representing approximately 250 million and 40 million actual visits during the 4-year period, respectively). Table 1 displays the demographic and diagnostic characteristics of OBVs and HBVs. Only 5% to 8% of HBVs did not include a consultation with a physician or resident. Univariate analysis found that patients seen in OBVs are significantly younger, more often male, and more likely to have non-Medicaid insurance. Table 2 presents a logistic regression model of site of care (HBV vs OBV) on the demographic variables. This model showed that, controlling for other patient demographic characteristics, HBVs were not significantly more common among minorities than among whites ( $p = .280$ ). However, HBVs were significantly more likely to be paid for by the patient (OR, 1.98;  $p < .001$ ) or Medicaid (OR, 2.29;  $p < .001$ ) than by other types of insurance, confirming the hypothesis that primary care visits from lower income children, as proxied by Medicaid coverage or no insurance coverage, are more likely than visits from children in wealthier families to be

**TABLE 1. Comparison of Characteristics Between Primary Care Patients in Office-based Visits and Hospital-based Visits**

	OBV		HBV	
	%	95% CI	%	95% CI
Patient's age, y				
5–10	48.45	45.17–51.74	41.28	39.16–43.44
11–15	31.10	29.21–33.05	30.49	28.98–32.05
16–20	20.45	18.42–22.65	28.23	26.33–30.20
<i>p</i> < .0001				
Patient's sex				
Male	50.79	49.46–52.12	46.90	45.59–48.21
Female	49.21	47.88–50.54	53.10	51.79–54.41
<i>p</i> = .0008				
Patient's race				
White	80.99	77.00–84.43	76.94	70.75–82.15
Minority	19.01	15.57–23.00	23.06	17.85–29.25
<i>p</i> = .1037				
Payment source				
Medicaid	17.83	14.76–21.39	32.72	26.58–39.51
No insurance	5.24	3.95–6.92	8.91	7.67–10.34
Other	76.93	72.52–80.82	58.37	51.96–64.51
<i>p</i> < .0001				
Location				
Urban (MSA)	78.84	69.80–85.73	78.43	65.66–87.36
Rural (non-MSA)	21.16	14.27–30.20	21.57	12.64–34.34
<i>p</i> = .9298				
Region of the country				
Northeast	24.60	6.38–60.98	21.15	5.97–53.10
Midwest	22.34	6.48–54.42	29.25	9.41–62.20
South	28.85	12.28–54.02	32.87	18.29–51.71
West	24.21	6.89–57.96	16.73	6.45–36.92
<i>p</i> = .1143				
Mental health diagnosis				
No	94.51	92.90–95.77	94.02	91.19–95.98
Yes	5.49	4.23–7.10	5.99	4.023–8.81
<i>p</i> = .7834				
Depression diagnosis				
No	99.14	98.68–99.45	98.75	98.29–99.09
Yes	0.86	0.55–1.32	1.25	0.91–1.71
<i>p</i> = .2410				
ADHD diagnosis				
No	96.71	95.54–97.58	97.17	96.29–97.84
Yes	3.29	2.42–4.46	2.83	2.16–3.71
<i>p</i> = .5649				

*p* values were generated from  $\chi^2$  analysis.

OBV indicates office-based visit; HBV, hospital-based visit; CI, confidence interval; ADHD, attention-deficit/hyperactivity disorder; MSA, metropolitan statistical area.

in hospital outpatient clinics rather than physician offices. Also significantly, HBVs are more likely to involve older female children and children in the Midwest.

### Diagnosis of Psychosocial Conditions

To determine whether location of care was associated with the frequency of psychosocial diagnoses, we attempted to develop models for each of the 2 studied diagnoses and a model for any psychosocial diagnosis. Our psychosocial diagnosis regression model found that the odds of a diagnosis are not significantly different for HBVs as compared with OBVs. However, visits from males and whites were significantly more likely to involve some psychosocial

diagnosis; age also plays a significant role, as depicted in Figure 1, decreasing the odds of psychosocial diagnosis for those younger than 12 and older than 18 years.

Our depression regression model found that the odds of a depression diagnosis are more than 4 times higher (OR, 4.40; *p* = 0.011; 95% CI, 1.4413.48) in HBVs than in OBVs (Table 3). In addition, the odds of diagnosis increased with age. A significant interaction between age and site of care was also seen. As depicted in Figure 2, the odds of depression diagnosis were generally larger for visits with older children, but smaller for HBVs with older children. We found no significant relationship between depression diagnosis and race within visits.

The regression model for ADHD (Table 3) found no relationship between visit location and diagnosis of ADHD; however, several other significant relationships were found. The odds of being diagnosed with ADHD were significantly higher for visits involving younger children and for male children.

### Treatment and Follow-up

Table 4 displays the  $\chi^2$  tests for difference in treatment and scheduled follow-up by site of care (OBV or HBV). No significant differences were found between OBVs and HBVs in the use of psychotropic medications or counseling or the scheduling of follow-up for any of the studied diagnoses. Multivariate logistic regression models predicting treatment and follow-up implied no significant relationship between location and treatment, even among those models for which no acceptable agreement was found between the model- and design-based approaches.

## DISCUSSION

For a majority of children, primary care providers, such as pediatricians and family physicians, act as the point of entry to the health care system, and, due in part to the growth of managed care, many primary care providers are taking responsibility for the management of psychosocial conditions that were historically managed by specialists.<sup>17</sup>

**TABLE 2. Logistic Regression Model for Use of Hospital-based Visits Among Patients Who Used Ambulatory Primary Care**

Explanatory Variable	OR	95% CI	<i>p</i>
Age, 12 y	1.043	1.206–1.061	<.001
(Age – 12 y) <sup>2</sup>	1.004	1.001–1.008	.014
Male	0.913	0.835–0.999	.047
Minority	1.189	0.864–1.635	.280
Medicaid	2.293	1.730–3.040	<.001
No insurance	1.979	1.536–2.549	<.001
Urban location	1.083	0.638–1.837	.763
Midwestern location	1.517	1.097–2.099	.013
Southern location	1.218	0.741–2.003	.428
Western location	0.827	0.535–1.279	.384

Reference group for HBVs is OBVs; reference group for male is female; reference group for minority is white; reference group for Medicaid and “no insurance” is “other insurance”; reference group for urban is rural; reference group for region variables is northeast. OR indicates odds ratio; CI, confidence interval; HBV, hospital-based visit; OBV, office-based visit.

*p* Values smaller than 0.05 are bold.

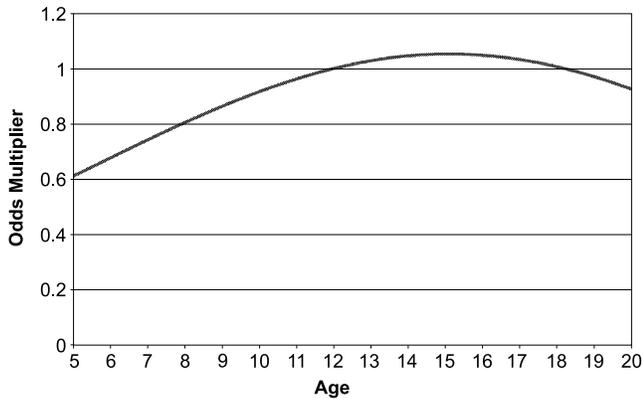


FIGURE 1. Effect of age on the odds of a psychosocial diagnosis.

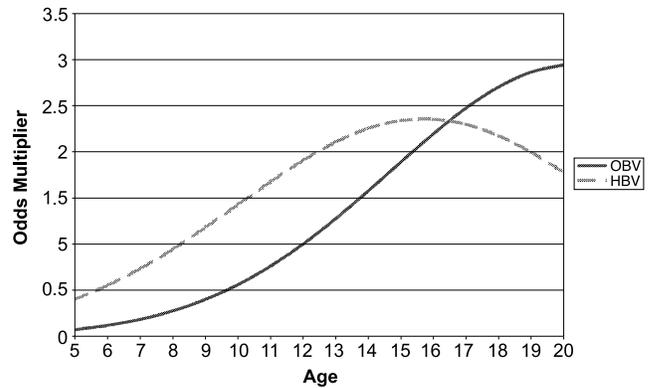


FIGURE 2. Effect of age and hospital-based visit (HBV) on odds of a depression diagnosis.

However, delivery of primary care is not uniform, and notable differences may exist in the patient characteristics and treatment patterns associated with primary care provided in a physician’s office compared with a hospital-based setting. It has been suggested that location differences may help to explain lingering racial and economic differences in diagnosis and treatment of psychosocial conditions.<sup>12</sup>

Our regression analysis confirmed the financial inequity of location of care, with visits from poor children being approximately 2 times more likely to occur at hospital-based facilities; however, our analyses did not confirm previous work documenting greater receipt of services by minority youth in hospital-based facilities controlling for other factors.<sup>10</sup> Our analysis of diagnosis and treatment of psychosocial conditions did not support an important role for location of care in diagnosis disparities. Location of care was unrelated to diagnosis of “any psychosocial condition” and unrelated to diagnosis of ADHD. Results from the depression model were actually the reverse of our speculation with larger numbers of HBVs including a diagnosis of depression.

In the case of depression, we found significantly higher rates of diagnosis in HBVs than in OBVs. No significant racial or insurance differences in the diagnosis of depression were found after controlling for other factors. It is possible that the large differential in diagnosis by location could be attributable to a differential underlying distribu-

tion of depressed patients. If patients with depressive symptoms were more likely to seek care in an institutional setting, then we would expect a higher diagnosis rate in that setting. Moreover, differences in visit frequency between the locations of care could explain the lack of support for our hypothesis. If depressed patients who use hospital-based facilities use health care services more often than those who use office-based facilities, there will be a greater chance of sampling these depressed persons in an HBV, which would cause an artificially high diagnosis rate in hospital-based facilities. Difference in underlying disease prevalence or frequency of visits could mask the hypothesized relationship if it exists. A patient-based rather than a visit-based survey may be needed to clarify some of these questions.

Unlike in depression, demographic characteristics were more predictive of ADHD diagnosis than location of care. Although we found no significant location difference for ADHD diagnosis after controlling for confounding factors, we found that visits including younger patients and male patients were more likely to include a diagnosis of ADHD. These findings are consistent with other epidemiological studies of ADHD.<sup>18</sup> This study provides evidence that frequently found disparities in diagnosis of psychosocial conditions are not primarily the result of differences in locations of care.

We had hypothesized that HBVs would involve fewer psychotropic drug prescriptions and scheduled follow-up

TABLE 3. Logistic Regression Models for Diagnosis of Psychosocial Conditions in Ambulatory Primary Care Visits

Outcome Variable Explanatory Variable	Any Psychosocial Diagnosis			Depressed Diagnosis			ADHD Diagnosis		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
HBV	1.229	0.552–2.737	.606	4.399	1.434–13.477	.011	0.778	0.406–1.489	.438
Age, 12 y	1.079	1.046–1.113	<.001	1.808	1.541–2.122	<.001	0.941	0.867–1.021	.138
(Age – 12 y) <sup>2</sup>	0.988	0.980–0.995	.002	0.965	0.949–0.981	<.001	0.956	0.939–0.972	<.001
Male	1.773	1.315–2.391	<.001	Not included in model			2.949	1.748–4.978	<.001
Minority	0.599	0.430–0.834	.003	0.580	0.236–1.423	.227	Not included in model		
Western region	1.005	0.586–1.725	.984	0.689	0.284–1.674	.402	1.007	0.479–2.115	.985
HBV-age interaction	Not included in model			0.719	0.611–0.846	<.001	0.840	0.786–0.898	<.001
HBV-Western region interaction	0.427	0.146–1.254	.118	Not included in model			0.512	0.197–1.327	.163

Reference group for HBVs is OBVs; reference group for male is female; reference group for minority is white; reference group for Medicaid and payout of pocket is “other insurance”; reference group for urban is rural; reference group for region variables is northeast. ADHD indicates attention-deficit/hyperactivity disorder; OR, odds ratio; CI, confidence interval; HBV, hospital-based visit; OBV, office-based visit.

TABLE 4. Treatment and Follow-up in Diagnosed Pediatric Primary Care Visits

	Any Psychiatric Diagnoses		Depressed Diagnoses		ADHD Diagnoses	
	OBV, % (95% CI)	HBV, % (95% CI)	OBV, % (95% CI)	HBV, % (95% CI)	OBV, % (95% CI)	HBV, % (95% CI)
Psychopharmacotherapy						
No	41.7 (35.4–48.4)	53.3 (36.9–69.0)	46.3 (31.5–61.8)	47.1 (24.9–70.6)	24.3 (18.8–30.8)	36.5 (22.8–52.7)
Yes	58.3 (51.6–64.6)	46.7 (31.0–63.1)	53.7 (38.2–68.5)	52.9 (29.4–75.1)	75.7 (69.3–81.2)	63.5 (47.3–77.2)
<i>p</i>		.15		.96		.07
Psychotherapy						
No	63.1 (54.4–71.0)	56.2 (32.4–77.4)	55.9 (40.5–70.3)	48.9 (27.3–70.9)	65.5 (55.0–74.7)	63.2 (37.8–83.0)
Yes	36.9 (29.0–45.6)	43.8 (22.6–67.6)	44.1 (29.7–59.5)	51.1 (29.1–72.7)	34.5 (25.3–45.0)	36.8 (17.1–62.2)
<i>p</i>		.51		.63		.82
Follow-up						
No scheduled	48.0 (37.5–58.7)	45.2 (33.6–57.4)	49.6 (31.2–68.0)	45.6 (36.8–54.7)	39.1 (28.9–50.3)	46.8 (31.0–63.2)
Referred	2.3 (1.1–4.7)	4.9 (2.9–8.2)	3.7 (1.1–11.8)	5.8 (2.7–11.9)	1.5 (0.3–6.1)	3.3 (1.6–6.8)
Scheduled or admitted	49.7 (39.9–59.5)	49.9 (36.3–63.4)	46.8 (28.0–66.6)	48.6 (39.7–57.6)	59.5 (48.8–69.4)	50.0 (32.3–67.6)
<i>p</i>		.29		.79		.31

*p* values were generated from  $\chi^2$  analysis.

ADHD indicates attention-deficit/hyperactivity disorder; OBV, office-based visit; HBV, hospital-based visit; CI, confidence interval.

appointments, but more counseling. Instead, we found no location of care differences in treatment or follow-up for any of the diagnoses. These findings are consistent with previous results<sup>19</sup> on primary care treatment of child psychosocial problems. It appears that differences in prescribed care are largely the result of diagnosis rates rather than bias in prescription practices or referrals among primary care recognized cases. These results could also be an artifact of sampling visits rather than patients.

A few limitations in this analysis should be noted. First, the NAMCS and the NHAMCS are cross-sectional surveys. Therefore, it is not possible to determine where the initial diagnosis of a psychosocial condition was made. Any differences in diagnosis rate by site may represent differences in the prevalence of such patients in that setting rather than differences in the rate of diagnosis. Second, the fact that a patient was sampled in a visit based on use of 1 type of care does not necessarily preclude their use of another location within the same period. Thus, it is possible that there is some level of cross-contamination between the HBV and OBV samples. In most cases, this type of cross-contamination biases results toward the null, thereby decreasing our ability to find site differences if they existed.

Despite these limitations, we have successfully combined surveys, both across years and across compatible instruments. Because the NAMCS and NHAMCS were

designed to be used together, we were able to combine the data from these 2 surveys into 1 megasurvey with the location of care as the highest level of the megasurvey design. Although this combination is not perfect—there could be unaccounted dependencies such as the same patients or providers being involved with visits across the location of care strata, and NAMCS samples only visits to physicians, whereas NHAMCS actively samples visits to many types of health care providers (28% of our HBV sample did not see a physician, resident, or intern)—this method of combining the NAMCS and NHAMCS allowed us to explore the importance of location of care to quality of care that would otherwise have required new data collection. This same methodology may be used in further studies to control for location of care when exploring other aspects of quality of care.

Based on the combined megasurvey, we conclude that site of care appears to be related to the diagnosis of depression, but not ADHD. Positively, there is no evidence of disparity of treatment once a diagnosis has been made and no evidence of racial/ethnic disparities in prescribed care.

*Acknowledgments.* The authors thank Alessio Farcomeni, University of Rome, Italy, and Ranita Fortenberry, Rollins School of Public Health, Emory University, for helpful discussions in the early development of this article.

## REFERENCES

1. Alegria M, Perez DJ, Williams S, et al. The role of public policies in reducing mental health status disparities for people of color. *Health Aff (Millwood)*. September–October 2003;22(5):65–72.
2. Alegria M, Canino G, Rios R, et al. Inequalities in use of specialty mental health services among Latinos, African Americans, and non-Latino whites. *Psychiatr Serv*. December 2002;53(12):1547–1555.
3. Wells K, Klap R, Koike A, Sherbourne C, et al. Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. *Am J Psychiatry*. December 2001;158(12):2027–2032.
4. Sturm R, Ringel JS, Andreyeva T, et al. Geographic disparities in children's mental health care. *Pediatrics*. October 2003;112(4):e308.
5. Rowland AS, Umbach DM, et al. Prevalence of medication treatment for attention deficit-hyperactivity disorder among elementary school children in Johnston County, North Carolina. *Am J Public Health*. 2002;92(2):231–234.
6. Olfson M, Gameroff M, et al. National trends in the treatment of attention deficit hyperactivity disorder. *Am J Psychiatry*. 2003;160(6):1071–1077.

7. Bussing R, Schoenberg NE, et al. Knowledge and information about ADHD: evidence of cultural differences among African-American and white parents. *Soc Sci Med*. 1998;46(7):919–928.
8. Horwitz S, Philip L, et al. Identification of psychosocial problems in a pediatric primary care: do family attitudes make a difference. *Arch Pediatr Adolesc Med*. 1998;152(4):367–371.
9. Bussing R, Zima BT, et al. Barriers to detection, help-seeking, and service use for children with ADHD symptoms. *J Behav Health Serv Res*. 2003;30(2):176–189.
10. Fried V, Prager K, et al. *Chartbook on Trends in the Health of Americans*. Hyattsville, MD: National Center for Health Statistics; 2003.
11. Medical Group Management Association. *Cost Survey: 2003 Report Based on 2002 Data*, Englewood, CO: Medical Group Management Association, 2003.
12. Landsverk J. Patient race and ethnicity in primary care management of child behavior problems: an important nonfinding. *Med Care*. 1999;37(11):1089–1091.
13. Cherry DK, Burt CW, et al. National Ambulatory Medical Care Survey: 2001 summary. *Adv Data*. 2003;337:1–44.
14. Hing E, Middleton K. National Hospital Ambulatory Medical Care Survey: 2001 outpatient department summary. *Adv Data*. 2003; 338:1–26.
15. Lohr SL. *Sampling: Design and Analysis*. North Scituate, MA: Duxbury; 1999.
16. Korn EL, Graubard BI. *Analysis of Health Surveys*. New York, NY: John Wiley and Sons; 1999.
17. Ringel JS, Sturm R. National estimates of mental health utilization and expenditures for children in 1998. *J Behav Health Serv Res*. 2001;28(3):319–333.
18. Rowland AS, Lesesne CA, et al. The epidemiology of attention-deficit/hyperactivity disorder (ADHD): a public health view. *Ment Retard Dev Disabil Res Rev*. 2002;8(3):162–170.
19. Kelleher KJ, McInerney TK, et al. Increasing identification of psychosocial problems: 1979–1996. *Pediatrics*. 2000;105(6): 1313–1321.

### *Literary Quotes*

#### **Continuity of Personality II**

*What happens to temperament differences and behavioral adjustment as children grow up? The existing behavioral science data seem to indicate that there is a substantial degree of continuity or stability but that they are never fixed and that some change does occur. Literary writers also provide us often with their informal observations. Although such views are not scientific in the strict sense, they may be insightful conclusions worthy of our notice and consideration and as guides to research. What about this selection from Washington Irving (1783–1859)?*

*“A tart temper never mellows with age, and a sharp tongue is the only edged tool that grows keener with constant use.”*

*The best known work of this American essayist, biographer, and historian is his popular story about Rip Van Winkle in his Sketch Book of Geoffrey Crayon, Gent. (1819). After drinking from a dwarf’s keg, Rip falls asleep for 20 years. Awakening, he has aged considerably and the colonial society he knew has altered much to the early federal period. Irving slips in this comment about how some people do not change much.*

*Submitted by William B. Carey, M.D.*

*May 20, 2006.*