

# Ethnic and Regional Differences in Primary Care Visits for Attention-Deficit Hyperactivity Disorder

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**ABSTRACT.** The ethnic and regional differences in primary care visits for children regarding the frequency of attention-deficit hyperactivity disorder (ADHD) diagnoses, stimulant prescriptions, and other mental health diagnoses were examined. The authors analyzed 6 years (1995–2000) of data from the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey and found that an ADHD diagnosis and/or a stimulant prescription were less likely to be recorded during visits by Hispanic-American youths relative to visits by white-American youths. The authors also found that stimulant prescriptions were given more frequently for visits of children with ADHD in the south and west than in the northeast. Finally, no ethnic differences were found in the likelihood of receiving a psychotropic medication once an ADHD diagnosis was given or receiving a mental health diagnosis other than ADHD. Ethnic disparities in primary mental health care appear to exist for ADHD and not for other mental disorders pooled together. *J Dev Behav Pediatr* 25:318–325, 2004. Index terms: *attention-deficit hyperactivity disorder, Hispanic American, primary care.*

Marked differences across ethnic groups in the use of mental health services, receipt of psychiatric diagnoses and the administration of psychotropic medications exist for adults.<sup>1–3</sup> These consistent findings suggest that important barriers to care for minority persons persist in the U.S. health care system.

Unfortunately, ethnic differences in childhood mental health care have received little empirical attention, particularly in regards to attention-deficit hyperactivity disorder (ADHD).<sup>4,5</sup> To date, the limited literature on the disparities in mental health services for children and adolescents of diverse ethnicity is mixed. Yeh et al<sup>6</sup> described the increased use of specialty mental health services among Hispanic-American and African-American youths. However, Kelleher et al<sup>7</sup> found identical referral, counseling, and prescription rates among pediatric patients seen for psychosocial problems in primary care settings. In part, these discrepancies may be a result of methodological differences and, in particular, the settings within which the research has been conducted.

Primary care sites are noted to be more important settings of care for Hispanic-American and African-American patients. In fact, Cooper-Patrick et al<sup>8</sup> suggested that primary care sites embedded in urban communities are a safety net

mental health provider for minority families who feel disenfranchised from specialty services. Primary care sites are a major provider of child and adolescent mental health services and provide the majority of psychotropic drug prescriptions to all children and adolescents in the United States. For example, Zito et al<sup>9</sup> found that the majority of visits for ADHD care were conducted by primary care physicians, as opposed to specialists such as psychiatrists and neurologists.

Very limited information is available about specific groups of ethnic children and adolescents and their mental health treatment in primary care. African-American children have been frequently reported to have higher teacher ratings of ADHD symptoms and other types of behavior problems relative to white-American children.<sup>10,11</sup> However, African-American children have been identified less often by pediatricians as having behavior problems<sup>12</sup> and are less likely to receive stimulant treatment compared with white Americans.<sup>13,14</sup> This disparity in access to treatment for African-American youths begs the question about where the health care system breaks down, given that stimulant treatment has extensive evidence supporting its efficacy for ADHD.

Although the Hispanic-American population is the fastest growing minority segment in the United States, even fewer studies have investigated differences in behavior problem identification and treatment between this ethnic group and others. Although some research suggests that Hispanic-American children and white-American children do not differ in terms of teacher ratings of ADHD symptoms,<sup>15</sup>

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other research suggests that Hispanic-American adolescents may actually have lower rates of ADHD, oppositional defiant disorder, and conduct disorder.<sup>16</sup> Many of the investigations<sup>17</sup> of ethnic differences in psychotropic medication practices have focused on minorities in general, thereby precluding conclusions about whether ethnic differences pertain to the Hispanic-American subpopulation.

Although the aforementioned investigations have begun to shed light on the nascent area of research regarding ethnic differences for childhood mental health care, these studies have also been hampered by methodological limitations. Many of these studies have either used small sample sizes,<sup>15</sup> a restricted age range,<sup>16</sup> data from single states,<sup>14</sup> or data from a single year.<sup>13</sup> One study<sup>18</sup> that did not find ethnic differences in detection of inattention and hyperactivity restricted its sample to office-based primary care sites, as opposed to hospital-based clinics, which serve a disproportionate share of patients from minority and low-income groups. Another study<sup>7</sup> that did not find ethnic differences in the detection of childhood behavior problems used the Pediatric Symptom Checklist as a parent screening for these issues. However, these screening measures are rarely used in typical primary care settings, and they may have sensitized parents to behavioral issues during office visits. In summary, the generalizability of ethnic effects found in the aforementioned studies remains largely unknown. The existing literature does not readily answer the question: "Do ethnic differences exist across the United States in regards to primary care mental health treatment for ADHD?"

In addition to ethnic differences, little is known about regional variations in mental health care across the United States. Group health risks and patterns of health care use vary by region. However, previous work ignores regional effects. This lack of information is due in large part to samples that focus solely on one locale. Hoagwood et al<sup>13</sup> provided one of the few studies that used national data and found that children in the South were more likely to receive stimulants than were children in the Northeast, West, or Midwest. Better understanding of regional differences would permit public health officials to target portions of the country in which quality care standards are in the greatest need for improvement.

We investigated ethnic and regional differences in childhood mental health care in primary care, focusing in particular on ADHD. To maximize the generalizability of the findings, we used 6 years (1995–2000) of two large, nationally representative data sets containing information on office-based and hospital-based primary care visits for children 3 to 18 years of age. We addressed three questions: (1) Do differences in the number of primary care visits for ADHD and stimulant medication exist by ethnicity or region? (2) Conditional on an ADHD diagnosis, are there differences in the likelihood of receiving psychotropic medication by ethnicity or region? (3) Are there ethnic or regional differences in mental disorders other than ADHD?

## METHOD

Visits to physicians in office-based settings and hospital outpatient clinics were analyzed using data from the 1995–

2000 National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS). The NAMCS, conducted annually by the National Center for Health Statistics (NCHS), samples a nationally representative group of visits to office-based physicians using a three-stage sampling design selecting primary sampling units, physician practices within primary sampling units, and patient visits within practices. Physicians record information on visits made over a randomly selected 1-week period. Depending on the size of the practice, the proportion of visits sampled during the 1-week period ranged from 20% to 100%. The NHAMCS uses similar methods to obtain a national probability sample of visits to hospital outpatient departments of noninstitutional, general, short-stay, and nonfederal hospitals in the United States. Physicians and hospital staffs completed a patient encounter form for each visit with the same form used in both surveys. For each visit, the surveys provided information on physician specialty or clinic type, to as many as three diagnoses and as many as six medications prescribed during the visit. Complete descriptions of the two data sets may be found on the NCHS website (<http://www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm>).

We limited our analysis to visits by children 3 to 18 years of age to primary care providers or primary care clinics. Primary care providers were defined as general practice pediatricians and physicians with family/general practice or internal medicine specialties. To increase power, we combined data from 1995–2000. There were 4283 visits to primary care office-based providers and 22,158 visits to primary care hospital outpatient clinics by children in the 1995–2000 NAMCS and NHAMCS samples.

## Diagnostic Groups

Diagnostic categorization of patients was based on diagnoses assigned by providers during the visit using the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM).<sup>19</sup> ADHD visits included visits with ICD-9 codes of 314.00 (attention deficit disorder without mention of hyperactivity) and 314.01 (attention deficit disorder with hyperactivity). There were 902 visits with an ADHD diagnosis in the samples. Other mental health visits included all visits with ICD-9 codes between 290.0 and 314.9, excluding the codes for ADHD. Visits with diagnoses corresponding to brain damage (310.x) also were not included. There were 752 visits with other mental health diagnoses included in the samples.

## Psychotropic Drug Visits

Prescribed medications were classified according to national drug codes recorded in the survey. A psychotropic drug visit was defined as a visit in which at least one psychotropic drug was prescribed, supplied, administered, ordered, or continued. Drugs in the class of psychotropics included those with National Drug Classification (NDC) codes (as defined by the NCHS) of 626 through 630. In addition, specific visits in which a stimulant was prescribed

were identified using an NDC code of 631. Drugs included in the class of stimulants were dextroamphetamine (Adderall), methylphenidate, pemoline, and methamphetamine (Desoxyn). There were 719 visits with a stimulant prescription in the samples.

### Demographic Variables

Patient age was categorized into three groups: 3 to 6, 7 to 12, and 13 to 18 years. Ethnicity was classified into three mutually exclusive groups: white American, African-American, and Hispanic American. Visits were additionally classified into regions using the definitions of the NCHS, defined as Northeast, Midwest, South, and West. Visits were also classified according to the setting (office-based versus hospital outpatient clinic). Finally, visits were categorized by type of insurance, identified as private insurance, Medicaid, self-pay, and all other insurance. Table 1 provides information regarding demographic characteristics of our sample.

### Statistical Methods

The goal of this analysis was to provide national estimates of the pattern of visits for ADHD and other mental health problems for children in primary care settings and compare these rates by ethnicity, age, and region. All visits made by children between 3 and 18 years of age were included in the analysis. The NCHS includes weights in the NAMCS and NHAMCS to enable the sample to represent all office visits and hospital outpatient clinic visits in the United States. The

proportion of ambulatory care visits with an ADHD diagnosis and the proportion of ADHD visits in which a stimulant or other psychotropic prescription was given are presented in Table 2. In addition, to capture all visits that could be broadly classified as an ADHD visit, visits with an ADHD diagnosis or a stimulant prescription were combined and rates of these visits were examined.

Next, the adjusted odds ratios of receiving an ADHD diagnosis, stimulant prescription, and any combination of an ADHD diagnosis and stimulant prescription and the adjusted odds ratio of receiving any other mental health diagnosis during a primary care visit was examined using logistic regressions. The models included dummy variables for age, ethnicity, region, and type of insurance. To test whether ethnic effects varied by region, separate models were run that also included interactions of ethnicity and region. In addition to these analyses, the adjusted odds ratios of receiving a stimulant prescription or of receiving another psychotropic medication given that a diagnosis of ADHD was assigned during the visit were calculated. The survey procedures in STATA were used to estimate all the models and to calculate means and SEs to account for the sampling strategy of the NAMCS and NHAMCS.

## RESULTS

### Ethnic and Regional Differences Regarding Attention-Deficit Hyperactivity Disorder

Tables 3 through 5 present respectively odds ratios regarding likelihood that an ADHD diagnosis is recorded

**Table 1. Ambulatory Care Visits by Children to Primary Care Providers in Office-Based and Hospital Outpatient Clinic Settings Included in the National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey Samples**

	All Visits		ADHD Diagnosis		Stimulant Prescription		Mental Health Diagnosis	
	N <sup>a</sup>	% <sup>b</sup>	n <sup>a</sup>	% <sup>b</sup>	n <sup>a</sup>	% <sup>b</sup>	n <sup>a</sup>	% <sup>b</sup>
Age (yr)								
3–6	8314	25.9	188	11.8	113	11.5	82	8.1
7–12	9082	31.1	564	64.2	451	55.6	239	21.2
13–18	9045	43.1	150	24.0	155	32.9	431	70.7
Ethnicity								
White American	16,406	76.0	590	86.4	468	86.9	535	81.1
African American	5074	12.0	200	9.4	153	9.3	116	11.3
Hispanic American	4117	12.0	96	4.2	86	3.8	89	7.6
Region								
Northeast	6498	17.3	327	26.1	266	25.5	289	21.4
Midwest	7281	32.8	242	33.4	179	28.0	211	35.0
South	8366	30.3	244	24.8	193	28.0	198	27.6
West	4296	19.6	89	15.7	81	18.5	54	16.6
Visit setting								
Office based	4283	75.4	91	67.9	81	68.4	83	72.4
Hospital outpatient clinic	22,158	24.6	811	32.1	638	31.6	669	27.6
Type of insurance								
Private	10,678	52.3	237	40.6	187	42.3	249	48.1
Medicaid	9713	24.8	498	35.0	400	32.4	329	24.6
Self-pay	2730	10.1	53	10.2	43	9.5	64	15.3
Other	3320	12.8	114	14.2	89	15.8	110	12.0

Data are from the 1995–2000 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey.

<sup>a</sup>The N/n represents the unweighted sample size.

<sup>b</sup>The percentage is calculated using weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

**Table 2. Proportion of Ambulatory Care Visits by Children to Primary Care Providers with an Attention-Deficit Hyperactivity Disorder Diagnosis and Proportion of Visits with an Attention-Deficit Hyperactivity Disorder Diagnosis with a Stimulant Prescription or Other Psychotropic Drug Prescription**

	ADHD Diagnosis		Stimulant Prescription		Other Psychotropic Drug Prescription	
	n	%	n	%	n	%
Age (yr)						
3–6	114,000	1.1	87,000	76.5	1000	1.0
7–12	621,000	4.7	435,000	70.1	54,000	8.8
13–18	232,000	1.3	183,000	78.9	23,000	6.5
Ethnicity						
White American	823,000	2.7	610,000	74.1	57,000	7.0
African American	90,000	1.9	65,000	72.4	3000	3.7
Hispanic American	49,000	0.8	28,000	69.6	3000	8.2
Region						
Northeast	252,000	3.5	140,000	56.3	17,000	6.9
Midwest	323,000	2.4	227,000	70.2	26,000	8.0
South	240,000	1.9	196,000	81.6	10,000	4.4
West	151,000	1.9	141,000	93.0	17,000	11.3
Visit setting						
Office based	656,000	2.1	506,000	77.1	49,000	7.5
Hospital outpatient clinic	311,000	3.1	199,000	64.2	21,000	6.9
Type of insurance						
Private	393,000	1.8	298,000	76.0	37,000	9.5
Medicaid	339,000	3.3	234,000	69.2	10,000	3.0
Self-pay	98,000	2.4	71,000	71.9	4000	4.1
Other	137,000	2.6	102,000	74.5	19,000	14.0

Data are from the 1995–2000 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey. The average annual number of visits (n) and the percentage of visits are calculated using weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

during a visit, the likelihood that a stimulant medication was prescribed during a visit, and the likelihood that either of those two events occurred during a visit. The likelihood is presented according to four child factors: ethnicity, age, region of the country, and type of insurance.

Ethnic and age differences emerged across all three tables. Specifically, an ADHD diagnosis and/or a stimulant prescription was less likely to be recorded during visits by Hispanic-American youths relative to visits by white-American youths ( $p < .01$ ). Ethnic differences between visits for white Americans and African-Americans approached but did not reach significance ( $p > .05$ ). Not surprisingly, an ADHD diagnosis and/or a stimulant prescription were less likely to be recorded for visits for 3- to 6-year-old and 13- to 18-year-old youths compared with visits for 7- to 12-year-old youths ( $p < .01$ ).

With regards to region of the country and type of insurance, only one difference was obtained: an ADHD diagnosis was more likely to be recorded during visits by children on Medicaid than for visits by children with other types of insurance. In addition, interactions between ethnicity and age, region of the country, and type of setting (office-based versus hospital outpatient clinic-based) were also tested. Three interactions are worth noting. First, African-American children were significantly more likely ( $p = .01$ ) to receive an ADHD diagnosis during visits in the Midwest relative to the Northeast. Second, in contrast, Hispanic-American children were significantly less likely ( $p = .01$ ) to receive an ADHD diagnosis during visits in the Midwest relative to the Northeast. Third, Hispanic-

American children were much less likely ( $p < .01$ ) to receive either an ADHD diagnosis or a stimulant prescription

**Table 3. Adjusted Odds of Receiving an Attention-Deficit Hyperactivity Disorder Diagnosis During Outpatient Visits to Primary Care Providers**

	Odds Ratio	<i>p</i> Value	95% Confidence Interval
Ethnicity			
White American	—	—	—
African American	0.62	.083	0.36–1.07
Hispanic American	0.27	.005	0.11–0.66
Age (yr)			
3–6	0.36	.001	0.21–0.62
7–12	—	—	—
13–18	0.30	.001	0.15–0.61
Region			
Northeast	—	—	—
Midwest	0.93	.808	0.52–1.67
South	0.93	.839	0.48–1.82
West	1.24	.543	0.61–2.51
Type of insurance			
Private	—	—	—
Medicaid	2.23	.011	1.21–4.11
Self-pay	1.19	.679	0.51–2.78
Other insurance	1.29	.345	0.76–2.19

Data are from the 1995–2000 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey using survey weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

**Table 4. Adjusted Odds of Receiving a Stimulant Prescription During Outpatient Visits to Primary Care Providers**

	Odds Ratio	<i>p</i> Value	95% Confidence Interval
Ethnicity			
White American	—	—	—
African American	0.69	.247	0.37–1.30
Hispanic American	0.28	.008	0.11–0.70
Age (yr)			
3–6	0.35	.001	0.20–0.63
7–12	—	—	—
13–18	0.37	.005	0.19–0.73
Region			
Northeast	—	—	—
Midwest	0.84	.600	0.43–1.65
South	0.94	.848	0.47–1.86
West	1.27	.520	0.61–2.65
Type of insurance			
Private	—	—	—
Medicaid	1.70	.110	0.88–3.27
Self-pay	0.93	.872	0.39–2.20
Other insurance	1.17	.621	0.62–2.21

Data are from the 1995–2000 National Ambulatory Medical Care Surveys and National Hospital Ambulatory Medical Care Survey using survey weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

during visits in an office-based setting compared with visits in a hospital outpatient clinic-based setting.

### Ethnic and Regional Differences Regarding the Likelihood of Receiving Psychotropic Medication for Attention-Deficit Hyperactivity Disorder

Tables 6 and 7 present the likelihood of receiving a stimulant prescription or receiving a nonstimulant psychotropic prescription for visits by the subset of children whom had been diagnosed with ADHD. No ethnic differences were found in terms of the likelihood of receiving a stimulant or nonstimulant prescription during a visit if a child had been diagnosed with ADHD ( $p > .10$ ). One key age difference was obtained. Nonstimulant psychotropic prescriptions were less likely to be given during a visit for a child 3 to 6 years of age with ADHD relative to a visit for a child 7 to 12 years of age with ADHD.

Other differences by region of the country and type of insurance emerged in Tables 6 and 7. To begin with, a stimulant prescription was more likely to be prescribed during visits for children with ADHD in the South and the West compared with visits for children with ADHD in the Northeast. Moreover, a stimulant prescription was more likely to be prescribed during a visit for a child with ADHD with private insurance relative to a visit for a child with ADHD who had other types of insurance, including Medicaid. Finally, a nonstimulant psychotropic prescription was more likely to be given during a visit for a child with ADHD without insurance (self-pay) than during a visit for a child with ADHD who had private insurance. Sample sizes were too small for Tables 6 and 7 to test for interaction effects between ethnicity and age, region of the country, and type of setting.

**Table 5. Adjusted Odds of Receiving an Attention-Deficit Hyperactivity Disorder Diagnosis or Stimulant Prescription During Outpatient Visits to Primary Care Providers**

	Odds Ratio	<i>p</i> Value	95% Confidence Interval
Ethnicity			
White American	—	—	—
African American	0.64	.082	0.38–1.06
Hispanic American	0.28	.003	0.12–0.63
Age (yr)			
3–6	0.35	<.001	0.21–0.59
7–12	—	—	—
13–18	0.37	<.001	0.21–0.62
Region			
Northeast	—	—	—
Midwest	0.75	.363	0.40–1.41
South	0.73	.363	0.37–1.44
West	0.94	.856	0.47–1.87
Type of insurance			
Private	—	—	—
Medicaid	2.25	.011	1.22–4.15
Self-pay	1.11	.808	0.49–2.52
Other insurance	1.41	.242	0.79–2.54

Data are from the 1995–2000 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey using survey weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

### Ethnic and Regional Differences Regarding Other Mental Health Diagnoses

Table 8 presents the likelihood of receiving a mental health diagnosis other than ADHD during ambulatory care

**Table 6. Adjusted Odds of Receiving a Stimulant Prescription During Outpatient Visits to Primary Care Providers with a Diagnosis of Attention-Deficit Hyperactivity Disorder**

	Odds Ratio	<i>p</i> Value	95% Confidence Interval
Ethnicity			
White American	—	—	—
African American	1.80	.224	0.69–4.70
Hispanic American	1.50	.358	0.63–3.61
Age (yr)			
3–6	0.50	.075	0.23–1.07
7–12	—	—	—
13–18	0.64	.411	0.22–1.87
Region			
Northeast	—	—	—
Midwest	2.10	.106	0.85–5.21
South	4.64	<.001	2.23–9.69
West	7.65	.001	2.30–25.47
Type of insurance			
Private	—	—	—
Medicaid	0.14	.001	0.04–0.41
Self-pay	0.20	.005	0.07–0.61
Other insurance	0.15	.004	0.04–0.53

Data are from the 1995–2000 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey using survey weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

**Table 7. Adjusted Odds of Receiving a Nonstimulant Psychotropic Medication Prescription During Outpatient Visits to Primary Care Providers with a Diagnosis of Attention-Deficit Hyperactivity Disorder**

	Odds Ratio	<i>p</i> Value	95% Confidence Interval
Ethnicity			
White American	—	—	—
African American	2.09	.257	0.57–7.60
Hispanic American	4.66	.106	0.72–30.38
Age (yr)			
3–6	0.40	.026	0.18–0.89
7–12	—	—	—
13–18	1.31	.782	0.19–9.21
Region			
Northeast	—	—	—
Midwest	1.47	.552	0.41–5.24
South	1.13	.871	0.26–4.90
West	1.34	.708	0.29–6.19
Type of insurance			
Private	—	—	—
Medicaid	1.32	.707	0.31–5.70
Self-pay	5.30	.001	2.01–14.01
Other insurance	0.90	.908	0.16–5.16

Data are from the 1995–2000 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey using survey weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

visits. The most common diagnoses were anxiety disorders ( $n = 136$ ), depressive disorders ( $n = 127$ ), adjustment disorders ( $n = 117$ ), and conduct disorder ( $n = 77$ ). No ethnic differences emerged, but a mental health diagnosis other than ADHD was more likely to be given during a visit by a child 13 to 18 years of age than during a visit for a child 7 to 12 years of age ( $p < .01$ ). In addition, another mental health diagnosis was less likely to be given during a visit for a child in the Midwest versus a visit for a child in the Northeast. Finally, another mental health diagnosis was more likely to be given during a visit for a child on Medicaid than for a visit for a child with private insurance.

## DISCUSSION

Differences between Hispanic-American youths and white-American youths were noted in terms of the likelihood of receiving stimulant medication or an ADHD diagnosis. The current investigation is one of the only national studies to explore differences between these two ethnic groups in regards to ADHD. A recent study<sup>20</sup> that examined children solely from Puerto Rico similarly concluded that Hispanic children with ADHD may be underidentified or undertreated by physicians. Several potential explanations exist for this disparity in care between the two groups. To begin with, language barriers may interfere with the ability of some Hispanic-American mothers to report ADHD symptoms to their child's primary care physician. Alternatively, some Hispanic-American mothers may have different developmental or pediatric

care expectations for their children relative to white-American mothers, may not be as likely to perceive ADHD symptoms as problematic, or may not perceive the need to discuss these behavioral issues with health care providers. The degree of acculturation may be an important factor in determining parental perceptions of ADHD symptoms. For example, Schmitz and Velez<sup>21</sup> recently reported that less acculturated Hispanic-American mothers (Mexican) are less likely to describe their children as having ADHD symptoms compared with more acculturated Hispanic-American mothers (Mexican American and Puerto Rican).

Still another explanation for our ethnic effect is that primary care physicians could have biases in their initial detection and treatment of ADHD regarding Hispanic-American youths. For instance, these health care providers may more readily dismiss these complaints if they are mentioned by Hispanic-American parents than if they are mentioned by white-American parents. Health care providers could also be less likely to have ongoing communication with Hispanic-American parents about ADHD symptoms and medication management once the disorder is diagnosed, although a small-scale recent study casts doubt on this explanation.<sup>22</sup> Finally, ADHD symptoms might occur less frequently in Hispanic-American youths compared with their white-American counterparts, although various investigators have not found widespread differences in teacher rating scale data between these two ethnic groups.<sup>15,23</sup>

No significant differences regarding ADHD were found between visits by African-American and white-American

**Table 8. Adjusted Odds of Receiving a Mental Health Diagnosis<sup>a</sup> During Outpatient Visits to Primary Care Providers**

	Odds Ratio	<i>p</i> Value	95% Confidence Interval
Ethnicity			
White American	—	—	—
African American	1.00	.996	0.50–2.03
Hispanic American	1.08	.853	0.49–2.37
Age (yr)			
3–6	0.57	.174	0.25–1.29
7–12	—	—	—
13–18	2.00	.008	1.21–3.31
Region			
Northeast	—	—	—
Midwest	0.52	.037	0.29–0.96
South	0.79	.458	0.42–1.48
West	0.66	.371	0.26–1.66
Type of insurance			
Private	—	—	—
Medicaid	3.25	.001	1.64–6.41
Self-pay	1.22	.777	0.31–4.84
Other insurance	1.21	.611	0.58–2.53

Data are from the 1995–2000 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey using survey weights provided by the National Center for Health Statistics to make the sample representative of all office-based and outpatient clinic visits in the United States.

<sup>a</sup>Includes all mental health diagnoses except attention-deficit hyperactivity disorder diagnoses.

children, suggesting that children in the two groups did not differ in terms of the likelihood of receiving an ADHD diagnosis and/or stimulant prescription during an office or clinic visit. This finding disagrees with those of previous studies covering a single year or state that indicate that African-American youths are less likely to be prescribed a stimulant.<sup>13,14</sup> One possible explanation as to why we found a weaker difference between these two ethnic groups than did previous studies is that our study covered a more recent time period (1995–2000). Previous work<sup>24</sup> suggested a diminution of ethnic disparities in treatment rates for another mental health issue, depression, during the 1990s. It is possible that care for children changed the same way with increased treatment rates for diagnosed cases of ADHD for African-American youths compared with white-American youths. Another explanation is that our multiyear, large, nationally representative study was more generalizable than previous investigations and hence was not as strongly influenced by sampling biases within regions.

In summary, an ADHD diagnosis and/or prescription of stimulants were less likely to be given during visits by Hispanic-American youths relative to white-American youths. The likelihood of either event occurring during a visit by African-American children was between that of visits for white-American and Hispanic-American children and was not significantly different from either ethnic group. Although we speculated on explanations for these findings, the reasons for these disparities are unclear and deserve further investigation. However, it should be stressed that no differences by ethnicity were found in the likelihood of receiving psychotropic medication once an ADHD diagnosis was given after controlling for age, region, and type of insurance.

In addition to ethnic differences, some interesting regional differences across the United States were obtained. During a visit for a child diagnosed with ADHD in primary care, stimulant prescriptions were more likely to be given in the South (which replicates the single-year findings of Hoagwood et al<sup>13</sup> and Cox et al<sup>25</sup>) and West relative to the Northeast. Greater opportunities for primary care physicians to refer to child psychiatrists in some portions of the Northeast may account for these medication differences. Thomas and Holzer<sup>26</sup> reported that the rate of child psychiatrists per 100,000 youths is considerably higher in Northeast states such as New York, Connecticut, Massachusetts, and Vermont relative to many of the states in the South and West. This finding underscores the importance of using national samples whenever possible and not automatically assuming that findings obtained for one locale will generalize to the United States as a whole. This finding also underscores the importance of training primary care physicians in the South and West in particular to use stimulants in the most efficacious manner possible.

Two important differences were found across visits according to type of insurance. First, an ADHD diagnosis or another mental health diagnosis was more likely to be given during a visit for a child with Medicaid than during a visit for a child with private insurance. Zito et al<sup>9</sup> also found a trend (albeit nonsignificant) for visits for children with

Medicaid to be more likely to involve an ADHD diagnosis compared with visits for children with private insurance. The current study's use of both office-based and hospital-based visits may explain the mild discrepancy in results relative to the Zito et al study. Second, once a child had been diagnosed with ADHD, stimulant prescriptions were dramatically less likely (odds ratio = 0.14) to be given during a visit for a child with Medicaid than during a visit for a child with private insurance. Children with Medicaid may be particularly reliant on primary care providers for first recognizing ADHD and other mental disorders. Thereafter, primary care physicians may be less likely to treat these children with Medicaid and more likely to refer them to psychiatrists, who may have more favorable reimbursement rates with this population.

We did not find ethnic differences in regards to the number of visits for mental health diagnoses other than ADHD. In other words, ethnic differences were found regarding ADHD but not for other mental health diagnoses pooled together. One possible reason for this finding is that parents from minority groups may be especially concerned about non-ADHD problem behaviors, such as disrespectfulness and oppositionality (see review of Schmitz and Velez<sup>21</sup>) and hence may be more likely to discuss these other mental health issues with treatment providers. Nevertheless, this explanation is highly speculative. More research is sorely needed on parent and physician perspectives for children from different ethnicities displaying a wide range of behavior problems. Unfortunately, sample sizes for specific diagnoses other than ADHD, such as depression, were not large enough to permit an analysis of ethnic and regional differences in primary care identification and treatment of other individual mental health disorders.

Limitations of the current study are worth noting. First, the cross-sectional nature of our data limits our conclusions. Although data were collected for several years, it was not collected for several years for individual patients. The cross-sectional nature of the data did not allow us to specify whether ethnic or regional differences in number of total visits were due to the number of different patients or the average number of visits per patient. In other words, differences between white-American and Hispanic-American youths in terms of likelihood of receiving stimulant medication could have been due to a combination of (1) a higher percentage of white-American children receiving stimulant medication from their primary care physician and (2) white-American children having more follow-up visits regarding stimulant medication than their minority counterparts.

If the former explanation is true, this finding suggests the need for better identification of childhood behavior problems for minority youths in primary care as well as future studies to investigate physician perspectives on psychotropic medication for minority youths. If the latter explanation is true, this finding suggests that minority youths are taking these medications for shorter periods of time or are having fewer follow-up appointments for medication adjustments, which are frequently needed for optimal treatment of ADHD. In the future, longitudinal data regarding ADHD treatment in primary care would

help tease out these different potential causes for ethnic disparities in mental health care.

Second, the use of African-American, Hispanic-American, and white-American groups in this study should not mislead readers into assuming there is a great deal of homogeneity within each ethnic group. For example, within the Hispanic-American group, there was undoubtedly major variation in language skills and acculturation to the United States, both of which could have significantly influenced our findings. Nevertheless, sample sizes did not permit analyses of important subgroup differences (e.g., Mexican versus Puerto Rican). Moreover, our two data sets did not

provide extensive information regarding socioeconomic status, a factor that might have better explained group differences than ethnicity did. Nevertheless, using insurance status as a proxy for socioeconomic status did not alter our ethnic effects, which is consistent with previous research indicating ethnic differences in mental health service use by middle-class adults.<sup>3</sup> In the future, collecting information on different ethnic subpopulations and collecting extensive socioeconomic information for individuals of different incomes levels within each ethnic group may identify even stronger correlates of disparities in ADHD care in primary care settings.

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