

Are Stimulants Overprescribed? Treatment of ADHD in Four U.S. Communities

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ABSTRACT

Objective: To address rising concerns about the possible overdiagnosis of attention-deficit hyperactivity disorder (ADHD) and overtreatment with stimulants. To date, almost no studies have examined ADHD in unbiased community-based studies, ascertaining both the prevalence of the diagnosis within nonreferred populations and the extent to which various treatments (i.e., stimulant medication, mental health treatments, and educational interventions) are used. **Method:** As a part of the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study, the authors examined epidemiological survey data obtained from 1,285 children and their parents across 4 U.S. communities. Analyses examined the frequency of children's ADHD diagnosis, the extent to which medications were prescribed, as well as the provision of other services (e.g., psychosocial treatments, school-based educational interventions). **Results:** Findings indicated that 5.1% of children met full *DSM-III-R* ADHD criteria across the pooled sample. Only 12.5% of children meeting ADHD criteria had been treated with stimulants during the previous 12 months. Some children who had been prescribed stimulants did not meet full ADHD diagnostic criteria, but these children manifested high levels of ADHD symptoms, suggesting that the medication had been appropriately prescribed. Children with ADHD were generally more likely to receive mental health counseling and/or school-based interventions than medication. **Conclusions:** Medication treatments are often not used in treating ADHD children identified in the community, suggesting the need for better education of parents, physicians, and mental health professionals about the effectiveness of these treatments. On the basis of these data it cannot be concluded that substantial "overtreatment" with stimulants is occurring across communities in general. *J. Am. Acad. Child Adolesc. Psychiatry*, 1999, 38(7):797-804. **Key Words:** attention-deficit hyperactivity disorder, attention deficit, hyperactivity, stimulants, misdiagnosis, services, treatment.

Recent media reports indicate that the public has become increasingly concerned about the apparent dramatic rise in the diagnosis of attention-deficit hyperactivity disorder (ADHD) and the prescription of psychostimulant

medications, particularly methylphenidate (Ritalin®) (Hancock, 1996). There are, in fact, well-documented increases in the rate of medication treatment for hyperactivity among elementary and secondary school students over the past 18 years (Safer and Krager, 1994). Because of increased rates of prescribing, the Drug Enforcement Agency (DEA), responsible for regulating the level of methylphenidate production, regularly has had to increase the yearly allowable methylphenidate production quotas (Schmidt, 1987).

Despite the interest in the topic, little is actually known about why these increases are occurring. Skeptics have noted that the amount of methylphenidate prescribed is much higher in the United States than in any other country (Hancock, 1996), and they argue that the increases indicate inappropriate use of stimulants—that they are being used to treat all types of behavioral and academic problems (Schmidt, 1987). Others suggest that these

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increases are not cause for concern, but simply reflect the heightened professional and public awareness that has increased the level of identification and treatment of the disorder (Swanson et al., 1995). Regardless of the accuracy of either of these positions, under some circumstances physicians' evaluations and assessments of children with suspected ADHD may be inadequate, leading to inappropriate diagnosis and treatment of presumptive ADHD (Hancock, 1996; Jensen et al., 1989), while in other cases, assessment and treatment may be appropriate. In addition, some cases of ADHD might be undiagnosed and/or untreated. So what is actually known about the nature and frequency of various forms of ADHD treatments, as delivered in the community?

ADHD Treatment Practices

Most treatments for ADHD fall into 2 categories: pharmacotherapy and various forms of counseling/psychotherapy. In addition, services provided within the school setting are frequently an essential part of the treatment plan. What is known about the frequency of provision of these services to children and adolescents with ADHD? We address each of these 3 components of ADHD treatment services below.

How Much Is Being Prescribed? Data from Safer and Krager's (1985, 1988, 1994) series of studies over a 22-year period (1971–1993) suggest increased levels of prescribing, with the rate of medication treatment for elementary school students increasing from 1.07% in 1971 to 5.96% in 1987. Moreover, the prevalence of medication treatment for middle school students increased from 0.59% in 1975 to 2.98% in 1993; the rate for high school students increased from 0.22% in 1983 to 0.70% in 1993. Most recently, Safer and colleagues (1996) reported that the number of methylphenidate prescriptions for adolescents increased 2.5-fold from 1990 to 1995. They attributed the rise in methylphenidate use to an increase in the number of girls receiving a diagnosis of ADHD, the longer duration of medication treatment, and growing public acceptance of psychostimulant prescriptions.

While these data indicate increases in rates of prescribing, other evidence suggests that many children with apparent ADHD are not being identified and treated. For example, Szatmari and colleagues (1989) conducted an epidemiological survey of 2,701 children and their parents in the province of Ontario, Canada. Using parent-, teacher-, and child-completed behavior checklists, they estimated that 5.8% of children met criteria for

ADHD, yet only a fraction of these same children (1 in 8) were taking any form of medication. More recently, Wolraich and colleagues (1996) conducted a county-wide checklist-based survey of teachers to determine the number of children within the school system who were rated with high levels of hyperactive and inattentive symptoms, and whether they were receiving medication. Findings indicated that despite high levels of ADHD-like symptoms in 11.4% of children, only approximately one fourth of these children had been diagnosed or treated with stimulants for ADHD. While findings from these 2 studies are informative, the extent to which they are more generally applicable to various communities across the United States is unclear. Moreover, the exclusive reliance on behavior checklists in both studies to obtain ADHD-relevant diagnostic information raises concerns about the validity of the ADHD diagnoses.

Frequency of Psychosocial Treatments. Bennett and Sherman (1983) found that in addition to using medication to treat hyperactivity, primary care physicians also reported using behavior modification, with significantly more pediatricians (94%) reporting its use than family physicians (71%) and general practitioners (61%). Similar findings have been reported by Copeland et al. (1987) and Moser and Kallail (1995). While these figures suggest relatively high levels of use of behavior therapies, they do not reflect what was done with individual children and are suspect on the grounds of likely overreporting due to social desirability factors and physicians' presenting their treatment practices in a favorable light. Data based on studies of the treatments that individual children actually receive suggest more problematic practices. Thus, Bosco and Robin (1980) reported that only 32% of identified hyperactive children received any form of counseling, and only 10% received behavior modification. The majority of children (74.5%) received methylphenidate, either alone or with the above 2 treatments. Similarly, Sandoval et al. (1980) found that 16.9% of children with ADHD were receiving some form of individual or parent counseling, and slightly more than one third (36.9%) were receiving some form of school-based intervention. Likewise, Jensen et al. (1989) found (based on medical records documentation) that only a small percentage of physicians implemented school interventions (16.2%) or psychotherapy (19.1%). And finally, in their survey of the province of Ontario, Szatmari and colleagues (1989) reported that less than one fifth of hyperactive children were receiving some form of mental

health and/or social services intervention, while one third of these children were receiving school-based special educational services. In toto, these studies all suggest that only a minority of ADHD children receive some individual or family-based mental health services, and they often do not receive school-based supports.

While these studies are of interest, studies of community-based samples of U.S. children are needed that demonstrate exactly how many children within given communities suffer from ADHD, and among these afflicted children, what types of services (medication, school-based services, or psychotherapeutic treatments) they do (or do not) receive. Do some children receive ADHD treatments (such as psychostimulants) who do not meet criteria for ADHD, and if so, how widespread is this phenomenon?

METHOD

During the first 6 months of 1992, we sampled youths aged 9 to 17 years and their primary caretakers in 4 communities (Atlanta, Georgia; New Haven, Connecticut; Westchester, New York; and San Juan, Puerto Rico). In what has become known as the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study (Lahey et al., 1996), we used epidemiological household sampling procedures to ascertain, enumerate, and recruit eligible children and families (one child per household) (see Lahey et al., 1996, for further description of samples and study methods). Children and their primary caretaker (usually the mother) were interviewed in their home by 2 lay interviewers (each blind to the other's findings), using a computer-assisted version (PC-DISC) of the National Institute of Mental Health Diagnostic Interview Schedule for Children (NIMH-DISC-2.3) (Shaffer et al., 1996). The analyses presented in this report include only those parent-child dyads for which DISC data allowed the diagnostic determination of ADHD in the child by either or both informants (1,285 total dyads). In most instances, children's primary caretakers were interviewed; 96% of caretakers were biological or adoptive parents. More than 98% of selected households were successfully enumerated, and 85% of families with an eligible child between ages 9 and 17 years participated in the survey.

Instruments and Measures

Version 2.3 of the NIMH DISC was used by all sites as the lay-administered structured diagnostic interview. The DISC generates diagnoses of major psychiatric diagnoses as defined by the *DSM-III-R* (American Psychiatric Association, 1987). The DISC has been shown to generate reliable and valid ADHD diagnoses (Jensen et al., 1995; Schwab-Stone et al., 1996). The second component of the computer-assisted interview used by all sites was a multipart assessment battery covering demographic factors, intellectual ability of the youth, patterns of service utilization, barriers to service utilization, functional impairment, and potential risk and protective factors including school and family environments, family history of psychiatric disorder, parental supervision, life events, and physical maturity (Service Use and Risk Factors Interview). Details on the impairment measures are provided by Bird et al. (1996), risk factors are outlined

by Goodman et al. (1998), and the service use measures are described by Leaf et al. (1996).

For the purposes of this article, we report services data concerning any medications prescribed (and by whom), school-based special educational services, and psychosocial treatments and/or counseling (and by whom). Type and intensity for each of these services within the past year were examined. In addition, parents completed a simple tally of yes/no questions asking whether they wanted or needed assistance for their child through various service options, e.g., school-based services, medicine for behavior problems, and counseling/psychotherapy. In this fashion, it could be determined whether those who wished for various treatment options actually obtained them.

To explore the possibility of over- versus underprescribing of psychostimulants, we determined whether children who were being treated with stimulants also met DISC criteria for ADHD, and conversely, we examined the extent to which children who met criteria for ADHD were receiving various forms of treatment, including psychostimulants.

Data Analyses

The total number of subjects who met *DSM-III-R* criteria for ADHD was determined for all 4 sites. We then examined the number of children who met criteria for ADHD and who were provided any of 3 types of treatment services, alone or in combination: medication (principally methylphenidate), any form of psychotherapeutic or behavioral treatment, or school-based services. Because availability of diagnostic and treatment services can vary substantially across different communities, we detail the ADHD prevalence rates and service use frequencies for each of the 4 communities. For comparative purposes, we examined the prevalence rates of services use in 3 groups: children with ADHD, children with other psychiatric conditions, and children with no psychiatric disorder. Because analyses were exploratory rather than hypothesis-driven (necessarily so, given the lack of information concerning the prevalence of ADHD treatments), power analyses were not conducted. However, confidence intervals of rates and proportions were computed to enable appropriate inferences about the strength of findings.

Thus this study takes advantage of community-based epidemiological samples drawn from 4 different U.S. communities to examine 3 vexing questions that have not been fully addressed in other studies to date: (1) To what extent are children with ADHD treated/undertreated across different communities? (2) What proportions of children with ADHD receive medication versus psychosocial treatments? (3) Within community samples, are "substantial" numbers of children with no evidence of ADHD being treated with stimulants?

RESULTS

In Table 1 the child and family demographic characteristics of the samples at each of the sites are described. In addition, this table documents significant differences across sites in the prevalence of ADHD, as well as in the frequency of psychosocial treatments and school-based services used in the past 12 months. Given the low medication prescribing rates overall, no significant differences were found across sites in proportions of children using stimulants or other medications. In general, chil-

TABLE 1
Child and Family Demographic Characteristics, ADHD Prevalence, and Services Use Frequencies, by Site (*N* = 1,285)

Demographics	Georgia	New Haven	New York	Puerto Rico	Total
Child age (SD)	12.8 (2.7)	12.7 (2.5)	13.0 (2.7)	13.2 (2.5)	
Parent age (SD)	39.4 (6.3)	40.4 (8.2)	42.2 (6.7)	42.0 (7.6)	
% Male	51.8	56.4	50.6	53.5	53.0
% White	63.6	78.0	62.5	1.0	51.6
% Black	30.4	10.8	18.1	0.0	14.8
% Hispanic	1.3	3.8	10.0	99.0	28.1
% Other	4.7	7.3	9.4	0.0	5.5
% 2-parent homes	79.3	75.5	76.7	65.7	74.3
Income					
% <20,000	11.4	15.3	17.2	63.8	26.7
% 20–54,000	54.9	47.5	25.6	29.2	38.6
% ≥55,000	33.4	36.3	54.4	6.4	33.5
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
ADHD cases	28 ^a (9.4)	22 ^a (7.0)	11 ^b (3.1)	5 ^b (1.6)	66 (5.1)
Service use, last 12 months					
Stimulants	4 (1.3)	6 (1.9)	5 (1.4)	1 (0.3)	16 (1.3)
$\chi^2 = 3.4$, NS					
Other medications	3 (1.0)	4 (1.3)	5 (1.4)	1 (0.3)	13 (1.0)
$\chi^2 = 2.2$, NS					
School services	26 (8.7)	35 (11.2)	33 (9.2)	9 (2.9)	103 (8.0)
$\chi^2 = 16.2$, <i>p</i> < .001					
Psychosocial treatments	25 (8.4)	36 (11.5)	50 (13.9)	16 (5.1)	127 (9.9)
$\chi^2 = 16.1$, <i>p</i> < .001					

Note: Different superscript letters denote significant pairwise differences between sites in ADHD frequency, based on χ^2 comparisons (all *df* values = 1). ADHD = attention-deficit hyperactivity disorder; NS = not significant.

dren from Puerto Rico received fewer services/treatments of all types.

In Table 2 we present data on the major types of services provided, as a function of diagnostic status: ADHD, any other mental disorder, or no disorder. Only 12% of children with ADHD received stimulant treatment. Roughly

one fourth of children with ADHD received some form of special services and assistance from the school, and almost one third of children with ADHD received some type of behavioral or psychotherapeutic help. Significant numbers of children with ADHD within these 4 communities were not receiving any services whatsoever.

TABLE 2
Numbers of Children Receiving Types of Services by Diagnostic Group

	ADHD (<i>n</i> = 66)	Other Diagnosis (<i>n</i> = 320)	No Diagnosis (<i>n</i> = 899)	Total (<i>N</i> = 1,285)
Stimulant	8 (12.1) [5.7–23.0]	4 (1.3) [0.4–3.5]	4 (0.4) [0.1–1.2]	16 (1.4) [0.9–2.3]
Other medications ^a	1 (1.5) [0.0–9.3]	9 (2.8) [1.4–5.4]	3 (0.3) [0.1–1.0]	13 (1.1) [0.6–1.9]
School-based services	16 (24.2) [14.9–36.6]	55 (17.2) [13.3–21.9]	32 (3.6) [2.5–5.1]	103 (8.0) [6.6–9.7]
Psychosocial treatments	21 (31.8) [21.2–46.6]	63 (19.7) [15.6–24.6]	43 (4.8) [3.5–6.5]	127 (9.9) [8.4–11.7]

Note: Percentages in parentheses; confidence intervals in brackets. ADHD = attention-deficit hyperactivity disorder.

^a Other medications included tricyclics (12 children), benzodiazepines (1 child), sedative-hypnotics (4 children), and anti-psychotic medications (2 children). Of these 19 instances, only 1 ADHD child received an “other medication” prescription (a tricyclic). Fourteen of the 19 instances of other medications were for the 9 children in the “Other Diagnosis” category (5 of these 9 children received 2 medications). The remaining 4 instances were for the 3 children in the “No Diagnosis” category.

TABLE 3
No. of ADHD Symptom Criteria Among Children With/Without ADHD Diagnosis
and With/Without Stimulant Treatment

	ADHD+ Stimulants+ (n = 8)	ADHD+ Stimulants- (n = 58)	ADHD- Stimulants+ (n = 8)	ADHD- Stimulants- (n = 1,211)
No. of ADHD behavior criteria; <i>F</i> = 86.4, <i>df</i> = 3, 1281, <i>p</i> < .0001	11.4 ^a	11.2 ^a	8.8 ^a	4.3 ^b
No. of ADHD duration criteria; <i>F</i> = 199.3, <i>df</i> = 3, 1281, <i>p</i> < .0001	10.3 ^a	9.3 ^a	6.1 ^b	1.7 ^c

Note: Different superscript letters denote significant pairwise differences between sites in ADHD criteria. ADHD = attention-deficit hyperactivity disorder.

Additional analyses (available from the authors upon request) indicated that primary care physicians do more than 85% of the prescribing. In terms of mental health and counseling treatments, 3% of children with ADHD were receiving mental health treatments from a psychiatrist; 12% were receiving help from a psychologist, while the remainder and the majority were receiving mental health treatments from other professionals, including general counselors, social workers, and others.

The cross-tabulation of diagnostic status by stimulant medication in Table 2 indicates that 8 of the 16 prescriptions for a psychostimulant were provided to children who did *not* meet full criteria for ADHD. To determine whether these prescriptions were being provided for children with ADHD but who no longer met full ADHD criteria (because they were being treated), we constructed a dimensional tally of all ADHD symptom criteria met by each subject. (The structure of the DISC interview allows the determination of subthreshold levels of symptoms, including criterion counts.) We then compared 4 groups of subjects: those who met ADHD criteria *and*

were treated with stimulants; those who met ADHD criteria *but were not treated* with stimulants; those who *did not meet* ADHD criteria *but were treated* with stimulants; and those who *neither met ADHD criteria nor were treated* with stimulants (most of the sample).

These comparisons are shown in Table 3. ADHD subjects treated with medication had similar levels of ADHD symptoms compared with those not so treated. Also, children who were treated with stimulants and who did *not* meet ADHD criteria nonetheless had quite high levels of ADHD symptoms. Finally, Table 4 indicates that fewer than one half of children who met criteria for ADHD received services deemed necessary by their parents. For example, 39 of 66 parents of children with ADHD noted their child's need for school services, but only 17 (43.6%) of these 39 children were actually receiving school services. Similar findings are noted for psychosocial treatments, in the general discrepancy between what parents think their children need versus what they actually receive. In relative contrast, regardless of diagnostic category, when parents believe that a child requires

TABLE 4
Numbers of Children Receiving Versus Needing Services, by Diagnostic Group

	ADHD DISC Diagnosis	Other DISC Diagnoses (Not ADHD)	No DISC Diagnosis
Receive vs. need school services	17/39 (43.6) [28.2–60.2]	86/146 (58.9) [50.5–66.9]	134/224 (59.8) [53.0–66.2]
Receive vs. need help w/child's behavior problems	13/36 (36.1) [21.3–53.8]	48/114 (42.1) [33.0–51.7]	33/87 (37.9) [27.9–49.0]
Receive vs. need counseling	17/36 (47.2) [30.7–64.3]	63/125 (50.4) [41.4–59.4]	41/128 (32.0) [24.2–40.9]
Receive vs. need medication	6/7 (85.7) [42.0–99.3]	16/19 (84.2) [59.5–95.8]	3/3 (100) [31.0–99.9]

Note: Percentages in parentheses; confidence intervals in brackets. ADHD = attention-deficit hyperactivity disorder; DISC = Diagnostic Interview Schedule for Children.

medication, it is readily available, regardless of whether the child meets full criteria for ADHD, other psychiatric conditions, or scores below the diagnostic threshold for any disorder.

DISCUSSION

Before discussion of our findings, several caveats are in order. First, it should be noted that our study sites' samples, while representative of 4 different communities, do not together constitute a nationally representative sample. Nonetheless, these 4 communities were quite diverse and interesting in their own right—a part-suburban, part-rural area in Georgia, a socioeconomically advantaged county in New York, an urban-suburban area from New Haven, and suburban San Juan of the island of Puerto Rico. To the extent that these differences are likely to shape access to services and patterns of care, the overall findings might reasonably be viewed as more broadly applicable to the range of communities and geographic areas across the United States than any single-site study. Of course, because the 4 communities were principally urban-suburban, studies of rural populations might yield quite different findings, especially given the scarcity of mental health resources and the greater reliance on non-specialist practitioners in such settings.

The second concern is related to the relatively small number of children on medication among those who meet criteria for ADHD. With a total of only 16 children being prescribed a stimulant (range: 1–5 across sites), the lack of significant differences among sites in 12-month prescribing rates is not surprising. While these small numbers could pose methodological problems for extensive analyses of the characteristics of the subgroup of children who are prescribed stimulants for ADHD, the relatively small number of children on medication is also quite informative, as it belies concerns about the presumed general overprescribing of stimulants for children with ADHD. Given other evidence about the large differences among physicians in the frequency of prescribing stimulant medications (Rappley et al., 1995; Sherman and Hertzog, 1991), a more cautious interpretation suggests that over- and underprescribing may both occur, but are likely to be region-, community-, and provider-specific.

A third concern pertains to the dramatic differences in rates of ADHD across several of our communities, in particular Georgia (9.4%) and Puerto Rico (1.6%). While this difference could reflect problems with the trans-

lation of the DISC into Spanish, we are inclined to think that this is not the case, since the Spanish version of the DISC has been demonstrated to have very good psychometric properties (Jensen et al., 1995; Ribera et al., 1996; Rubio-Stipec et al., 1994; Schwab-Stone et al., 1996). A perhaps more plausible explanation has been advanced by other investigators (Ho et al., 1996; Mann et al., 1992), namely, that substantial differences in rates of reporting of ADHD symptoms occur across cultures, possibly because of different cultural thresholds to what constitutes acceptable versus deviant behaviors.

A fourth and final limitation concerns the tentative nature of our determination of what might constitute appropriate versus inappropriate prescription practices. The simple examination of whether a child who is receiving a psychostimulant also meets ADHD diagnostic criteria is obviously an imperfect criterion for determining “appropriate prescribing practices,” but given the fact that these issues have remained relatively unexplored in the literature to date, such an approach is a reasonable first step.

In contrast to our study's weaknesses, unlike previously reported studies that in almost all instances described only the use of medications and medication-based practices, we were able to augment medication information with data about the range of school-based and mental health services that families might receive. Another strength in our study was our use of a standardized diagnostic interview to ascertain caseness of ADHD.

Implications

Concerns about dramatic levels of overprescribing are not supported by these data—fewer than 1 in 8 children with ADHD were actually taking medications. Of note, however, 8 of the 16 children who were prescribed a stimulant did not meet diagnostic criteria for ADHD. This could have been due to the fact that some of these children had *treated* ADHD and no longer met diagnostic criteria *as a function of stimulant treatment*, as indicated by our analyses in Table 3. As seen in Table 3, symptoms (elevated well above those of nontreated children) of ADHD were found in *all* stimulant-treated children, regardless of whether they met full ADHD criteria. These data indicate that stimulant medications generally are being prescribed for children with ADHD or significant residual symptoms of such. Of course, because increases in stimulant prescriptions have continued subsequent to our study, were we to redo our study in 1998, altogether different results could well emerge.

A second implication from our findings concerns the types of treatments children with ADHD most frequently receive, compared to public perceptions and media reports. One third of children with ADHD received some form of counseling or mental health services, followed then by school-based services, compared with one eighth of the ADHD children receiving medication. Thus, in spite of the concerns that medication treatments are being substituted for other more appropriate treatments, such does not necessarily appear to be the case. More troubling, many children are not receiving needed services, regardless of whether they meet criteria for ADHD or some other condition. For example, Table 2 indicates that among the 66 children with ADHD, only about one fourth to one third received school-based or psychotherapeutic services. These findings parallel previous reports that have suggested that of children needing mental health care, only about one third are actually receiving care (Institute of Medicine, 1989).

Reasons for these relatively low rates of prescribing for children with ADHD are unclear. If replicated, these findings may suggest that in the absence of specialists such as child psychiatrists, many pediatricians may be uncomfortable with prescribing, or when they do prescribe, use low, fixed doses that may not be maximally effective, leading families to explore other alternatives. Another possibility is that some of these children had received medication in earlier years. Regardless, these findings indicate that when a child is *currently* having significant home and school-based problems and is getting some form of behavioral or psychotherapeutic mental health care, parents', mental health providers', and possibly even physicians' concerns about or reluctance to use medication may require further education about the safety and efficacy of these current treatments and better information dissemination concerning their appropriateness.

It would have been optimal to have better process measures of mental health professionals' treatment practices, that is, the actual nature and quality of care rendered by providers and the extent to which services used empirically based treatments. Such in-depth measures are required to truly gauge what constitutes appropriate treatment, or to determine "over- versus underprescribing." While undertreatment and overtreatment, underdiagnosis and overdiagnosis certainly are real phenomena with any medical condition, alarmist or exaggerated reports can also do significant harm in that they discourage parents from seeking treatment for suffering children

or otherwise increase the stigma and blame borne by families.

Critical questions to be answered in the near future concern the relative effectiveness of medication versus psychosocial treatments (Arnold et al., 1997; Richters et al., 1995), used alone or in combination, and how clinical outcomes differ among children who receive these various treatments. However, pending new data, the bulk of evidence to date suggests that stimulant medication is the most effective intervention for ADHD (e.g., Horn et al., 1991). Given the indication from our findings that children treated with stimulants have clearly elevated levels of ADHD symptoms, and that substantial numbers of children with ADHD are not receiving these efficacious interventions, our data do not support the notion that stimulants are overutilized for children with ADHD. Given the widespread concern about presumed inappropriate use of medication, better education appears warranted for parents, physicians, and the media about the appropriate assessments and treatments for ADHD.

The MECA study is an epidemiological methodology study performed by 4 independent research teams in collaboration with staff of the Division of Clinical Research, which was reorganized in 1992 with components now in the Division of Services and Intervention Research and the Division of Mental Disorders, Behavioral Research, and AIDS, of the NIMH, Bethesda, MD. The NIMH Principal Collaborators are Darrel A. Regier, M.D., M.P.H., Ben Z. Locke, M.S.P.H., Peter S. Jensen, M.D., William E. Narrow, M.D., M.P.H., Donald S. Rae, M.A., John E. Richters, Ph.D., Karen H. Bourdon, M.A., and Margaret T. Roper, M.S. The NIMH Project Officer was William J. Huber. The Principal Investigators and Coinvestigators from the 4 sites are as follows: Emory University, Atlanta, UO1 MH46725: Mina K. Dulcan, M.D., Benjamin B. Lahey, Ph.D., Donna J. Brogan, Ph.D., Sherryl Goodman, Ph.D., and Elaine Flagg, Ph.D.; Research Foundation for Mental Hygiene at New York State Psychiatric Institute (Columbia University), New York, UO1 MH46718: Hector R. Bird, M.D., David Shaffer, M.D., Myrna Weissman, Ph.D., Patricia Cohen, Ph.D., Denise Kandel, Ph.D., Christina Hoven, Dr.P.H., Mark Davies, M.P.H., Madelyn S. Gould, Ph.D., and Agnes Whitaker, M.D.; Yale University, New Haven, CT, UO1 MH46717: Mary Schwab-Stone, M.D., Philip J. Leaf, Ph.D., Sarah Horwitz, Ph.D., and Judith H. Lichtman, M.P.H.; University of Puerto Rico, San Juan, UO1 MH46732: Glorisa Canino, Ph.D., Maritza Rubio-Stipec, M.A., Milagros Bravo, Ph.D., Margarita Alegria, Ph.D., Julio Ribera, Ph.D., Sara Huertas, M.D., Michael Woodbury, M.D., and Jose Bauermeister, Ph.D.

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The Association Between Smoking and Unhealthy Behaviors Among a National Sample of Mexican-American Adolescents.

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This study examined the relationship between smoking and participation in unhealthy behaviors among Mexican-American adolescents through a secondary analysis of national data. Mexican-American adolescents ($N = 580$), ages 10 through 18 years who were interviewed as part of the 1993 Teenage Attitudes and Practices Survey (TAPS II), were selected for analysis. Data collected included smoking status of the adolescent and participation in certain unhealthy behaviors. Among girls in the study, smokers were more likely to not wear a seat belt, be involved in physical fighting, not be involved in organized sports, perform poorly in school, say they like to do risky things, and ride in a car with a drunk or high driver. For boys, smoking was significantly associated with liking to do risky things, fighting, not attending church, and poor academic performance. These results suggest that Mexican-American adolescents who smoke may be at higher-risk for engaging in behaviors that could compromise their health and safety, and for not being involved in activities that may exert a protective influence. *J Sch Health* 1998;68:376-380.

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