National Trends in the Use of Psychotropic Medications by Children

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ABSTRACT

Objectives: Little information exists on national trends in the use of psychotropic medication by children and adolescents. The objective of this report is to compare patterns and predictors of psychotropic medication use by children and adolescents in the United States in 1987 and 1996. **Method:** An analysis of medication use data is presented from two nationally representative surveys of the general population focusing on children 18 years of age and younger who used one or more prescribed psychotropic medication during the survey years. Rates of stimulant, antidepressant, and other psychotropic medication use are reported. **Results:** The overall annual rate of psychotropic medication use by children increased from 1.4 per 100 persons in 1987 to 3.9 in 1996 ($p < .0001$). Significant increases were found in the rate of stimulant use (0.6 per 100 persons to 2.4 per 100 persons), antidepressant use (0.3 per 100 persons to 1.0 per 100 persons), other psychotropic medications (0.6 per 100 persons to 1.2 per 100 persons), and coprescription of different classes of psychotropic medications (0.03 per 100 persons to 0.23 per 100 persons), especially antidepressants and stimulants. Rates of antipsychotic and benzodiazepine use remained stable. In 1996, stimulant use was especially common in children aged 6 to 14 years (4.1 per 100), and antidepressant use was common in children aged 15 to 18 years (2.1 per 100 persons). **Conclusion:** Between 1987 and 1996, there was a marked expansion in use of psychotropic medications by children, especially stimulants and antidepressants. *J. Am. Acad. Child Adolesc. Psychiatry*, 2002, 41(5):514–521. **Key Words:** psychotropic medication use, national trends.

The extent of use of methylphenidate and other psychotropic medications by children and adolescents continues to engender considerable public controversy. Magazines, newspapers, and widely watched television shows regularly highlight the side effects, potential for misuse, and risk of dependence on stimulants and other psychotropic medications prescribed to children (Gibbs, 1998; Goldman et al., 1998; Kluger, 1998; Ziegler, 2000). Reports of increasing use of psychotropic medications (Kelleher et al., 2000; Safer, 1997), especially by younger children (Rappley et al., 1999; Zito et al., 2000), have further aroused public concern regarding the safety of these medications in children.

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Despite the high visibility of this topic, little information exists concerning national patterns of psychotropic medication use by children and adolescents. Some researchers have made rough national estimates of stimulant use from Drug Enforcement Administration (DEA) bulk production quotas of methylphenidate (Morrow et al., 1998), from audits of the volume of stimulant prescriptions dispensed by pharmacies (Batoosingh, 1995), and from surveys of stimulant prescriptions written by physicians (Hoagwood et al., 2000; Jensen et al., 1999a; Pincus et al., 1998). However, medication prevalence estimates based on these sources of information may be quite misleading due to wide underlying variation in prescription-to-person ratios (Zito et al., 1998b).

Regional data have also been used to draw inferences about national trends in psychotropic medication use by children and adolescents. For example, a continuing survey of public school nurses in Baltimore County revealed that methylphenidate use for attention deficit disorder among children aged 5 to 17 years increased from 2.1% (1991) to 3.7% (1995) (Safer et al., 1996). An increase in

methylphenidate use for attention-deficit/hyperactivity disorder (ADHD) has also been reported among Maryland Medicaid enrollees aged 5 to 14 years, from 1.9% (1990) to 4.7% (1995) (Zito et al., 1995). However, marked geographic variation in rates of stimulant and other psychotropic use by children limit the certainty with which such regional data may be safely generalized to the nation. For example, on a per capita basis, a ten-fold variation has been reported in county-to-county comparisons of the rates of methylphenidate prescription (Rappley et al., 1996), and a six-fold variation in rate of psychotropic medication prescription to children has been reported across private preferred provider plans (Hong and Shepherd, 1996).

Administrative billing records may not accurately portray all medication use. For example, medications that are dispensed without payment or reimbursement (e.g., free samples, clinic distribution), are not captured in administrative billing records. This may be particularly common for medications that do not fall under the DEA scheduling provisions of the Controlled Substances Act. Administrative billing records also tend to capture only one socioeconomic stratum of the population.

We provide national estimates of rates of psychotropic medication use based on two nationally representative samples of children and adolescents. We also report age, gender, race, region, and insurance type-specific temporal trends in the use of stimulants, antidepressants, and other psychotropic medications during the past decade. Trends in coprescription are also examined.

METHOD

Sources of Data

Data were drawn from the household component of the 1987 National Medical Expenditure Survey (NMES) (Edwards and Berlin, 1989) and the 1996 Medical Expenditure Panel Survey (MEPS) (Cohen, 1997a). Both surveys were sponsored by the Agency for Healthcare Research and Quality to provide national estimates of the use, expenditures, and financing of health services. The NMES and MEPS surveys were conducted as national probability samples of the U.S. civilian, noninstitutionalized population.

Study Samples

The 1987 NMES had a stratified multistage area probability design. This involved selection of 165 primary sampling units (PSUs), selection of segments within PSUs, selection and screening of an equal probability sample of housing units within segments, and selection of a subsample of the screened housing units based on demographic characteristics. A designated informant was queried about all related persons who lived at the selected address or dwelling unit. A total of 15,590 dwelling units were targeted. There were 34,459 individuals in the study, representing a response rate of 80.1%. The study sample included the 10,389 children 18 years old or younger.

The 1996 MEPS household component was drawn from a nationally representative subsample of the 1995 National Health Interview Survey that included 195 PSUs and approximately 1,700 segments, yielding approximately 10,500 responding households. The MEPS obtained data from approximately 9,400 households, resulting in 21,571 individuals. The survey response rate was 78%. There were 6,490 children 18 years old or younger.

The Agency for Healthcare Research and Quality devised weights to adjust for the complex survey design and yield unbiased national estimates. The sampling weights also adjust for nonresponse and poststratification to population totals based on U.S. census data. More complete discussions of the design, sampling, and adjustment methods are presented elsewhere (Cohen, 1997b; Cohen et al., 1991). All statistical analyses and significance tests were performed with the SUDAAN software package (Shah et al., 1997) to accommodate the complex sample design and the weighting of observations.

Structure of Survey

Survey data collection for the NMES began with a screening interview of households in the national area probability sample. Selected households were then interviewed four times over a 16-month period in 1987 and 1988 to obtain health care utilization information for the 1987 calendar year (reference period). The four interviews (rounds) extended beyond the 12-month reference period because a 4-month period was required to complete each round (Edwards and Berlin, 1989). The MEPS had a panel design involving data collection through a preliminary mail and telephone contact, followed by a series of six in-person rounds of interviews over a 2.5-year period. Results are reported from the first three rounds that constitute the 1996 panel (Cohen, 1997a). In both surveys, respondents, who were usually the parent or adult guardian of the child, were asked to record medical events for members of the family as they occurred in a calendar/diary that was reviewed in-person during each interview round. Permission to contact providers, pharmacies, and employers was obtained from the participants.

Written permission was obtained from selected survey participants to contact medical providers they or household members reported seeing during the survey period to verify service use, medications, charges, and sources and amounts of payment. Verification procedures were implemented for all pharmacy purchases, HMO visits, and outpatient hospital visits, and for one half of office-based visits.

Use of Psychotropic Medications

The NMES and MEPS surveys ask for each prescribed medicine bought or otherwise obtained by the survey participants during the reference period. We focus on prescribed psychotropic medications by persons 18 years of age or younger. Psychotropic medications were initially grouped by American Hospital Formulary System therapeutic classes as stimulants, antidepressants, anticonvulsants, sedative/hypnotics, benzodiazepines, miscellaneous anxiolytics, and lithium (McEvoy, 1996). These groups were then combined as stimulants, antidepressants, and other psychotropic medications. Anticonvulsants included among the "other psychotropic medications" were limited to medications that have been used as mood stabilizers: carbamazepine, valproic acid, divalproex sodium, and gabapentin. All uses of these medications were included in the analyses. In some analyses, the medications were combined with lithium preparations as "mood stabilizers."

Insurance Type

NMES and MEPS interviewers asked respondents their primary sources of insurance during the month prior to the first interview. From these data, summary variables were constructed indicating any

private insurance, any public insurance coverage, or no insurance. These groups are not mutually exclusive.

Analysis Plan

For each survey year, we examine sociodemographic characteristics of children who used any psychotropic medication, an antidepressant, or a stimulant. Rates of psychotropic medication use per 100 persons for each survey year were then computed overall and stratified by sociodemographic characteristics. The χ^2 test was used to examine the similarity of the distribution of demographic characteristics across survey year. Confidence intervals for population proportions were calculated to facilitate comparisons of rates of medication use across survey years within sociodemographic categories.

We used a logistic regression model to evaluate the association between survey year and psychotropic medication prescription while adjusting for changes in patient characteristics between the survey years. We controlled for age, sex, race, geographical region of residence, and insurance status. Similar models were used to estimate the association between survey year and rate of antidepressant medication and stimulant medication use.

RESULTS

Background Characteristics

Table 1 presents the background characteristics of the study samples. Between 1987 and 1996, there was a substantial increase in the proportions of children who were Hispanic, publicly insured, and between 6 and 14 years of age.

Psychotropic Medications

During the study period, the overall rate of psychotropic medication use increased from 1.4 to 3.9 per 100 children and adolescents (Fig. 1). Significant increases were evident across all geographic regions and all age, race/ethnicity, sex, and insurance groups examined. After we controlled for the possible confounding effects of these background characteristics, the likelihood of using a psychotropic medication increased nearly three-fold between 1987 and 1996 (2.94, 95% confidence interval [CI]: 2.38–3.79).

In 1996, the highest rates of psychotropic medication use were observed among whites, males, children 6 to 18 years of age, children residing in the South, and those with public insurance. The rate of psychotropic medication use by children without insurance was less than one-half that of children with public or private insurance (Table 2).

Stimulants

There was a significant increase in the overall rate of stimulant medication use by children between 1987 and 1996. Stimulant use increased from 0.6 to 2.4 per 100 children and adolescents (Fig. 1). After we controlled for the sociodemographic covariates, the likelihood of using a stimulant increased almost four-fold (3.92, 95% CI:

TABLE 1
Sociodemographic Characteristics of Children and Adolescents in 1987 and 1996

Characteristic	1987 % (N = 10,389)	1996 % (N = 6,490)	Statistic
Age, years			$\chi^2_2 = 21.6, p < .0001$
<6	35.5	32.0	
6–14	43.2	47.7	
15–18	21.3	20.3	
Gender			$\chi^2_1 = 0.7, p = .41$
Female	49.2	48.5	
Male	50.8	51.5	
Race			$\chi^2_2 = 9.1, p = .011$
African American	15.1	15.5	
Hispanic	10.6	14.6	
White/other	74.4	69.9	
Insurance			
Private	64.5	63.8	$\chi^2_1 = 0.16, p = .69$
Public	16.2	22.2	$\chi^2_1 = 19.4, p < .0001$
None	16.8	15.8	$\chi^2_1 = 0.91, p = .34$
Region of residence			$\chi^2_3 = 6.10, p = .10$
Northeast	18.2	18.6	
Midwest	26.3	23.8	
South	36.0	34.5	
West	19.5	23.2	

Note: Data are from the 1987 National Medical Expenditure Survey (Edwards and Berlin, 1989) and the 1996 Medical Expenditure Panel Survey (Cohen, 1997a,b). The percentages are weighted to be nationally representative of all children 18 years of age or younger in the United States.

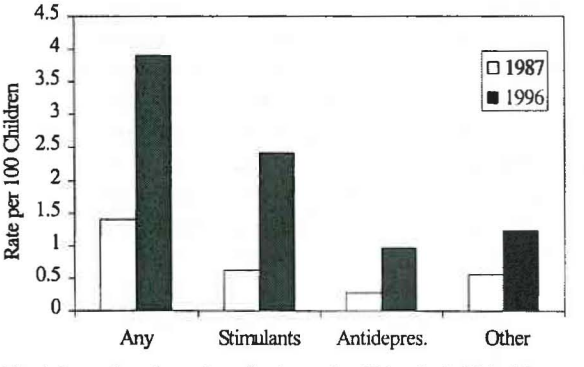

Fig. 1 Rates of psychotropic medication use by children in the United States. Data are from the 1987 National Medical Expenditure Survey (Edwards and Berlin, 1989) and the 1996 Medical Expenditure Panel Survey (Cohen, 1997a,b). Rates are for persons aged 18 years and younger. See text for definition of psychotropic medication groups.

TABLE 2
National Rates of Psychotropic Use by Children and Adolescents in 1987 and 1996

	Rates of Any Psychotropic Medication Use per 100 Children and Adolescents (95% CI)	
	1987	1996
Age, years		
<6	0.46 (0.19–0.73)	0.82 (0.35–1.29)
6–14	1.89 (1.38–2.40)	5.41 (4.43–6.39)
15–18	1.76 (1.17–2.35)	5.15 (3.72–6.58)
Gender		
Female	1.04 (0.71–1.37)	2.51 (1.86–3.16)
Male	1.67 (1.30–2.04)	5.18 (4.20–6.16)
Race		
African American	0.56 (0.25–0.87)	2.79 (1.63–3.95)
Hispanic	0.55 (0.14–0.96)	2.16 (1.38–2.94)
White	1.69 (1.34–2.04)	4.68 (2.84–5.52)
Insurance		
Private	1.71 (1.32–2.10)	4.07 (3.38–4.76)
Public	1.09 (0.44–1.74)	5.27 (3.64–6.90)
None	0.53 (0.18–0.88)	1.52 (0.78–2.26)
Region of residence		
Northeast	0.98 (0.47–1.49)	3.12 (2.14–4.10)
Midwest	1.73 (1.10–2.36)	4.42 (2.75–6.09)
South	1.54 (1.07–2.01)	5.20 (4.08–6.32)
West	0.86 (0.51–1.21)	2.04 (1.20–2.88)

Note: Data are from the 1987 National Medical Expenditure Survey (Edwards and Berlin, 1989) and the 1996 Medical Expenditure Panel Survey (Cohen, 1997a,b). CI = confidence interval.

TABLE 3
National Rates of Stimulant Use by Children and Adolescents in 1987 and 1996

	Rates of Stimulant Use per 100 Children and Adolescents (95% CI)	
	1987	1996
Age, years		
<6	0.22 (0.02–0.42)	0.31 (0.04–0.58)
6–14	1.18 (0.81–1.55)	4.14 (3.28–5.00)
15–18	0.15 (0–0.31)	1.56 (0.76–2.36)
Gender		
Female	0.28 (0.10–0.46)	1.23 (0.76–1.70)
Male	0.95 (0.66–1.24)	3.54 (2.68–4.40)
Race		
African American	0.26 (0.04–0.48)	2.02 (1.00–3.04)
Hispanic	0.15 (0–0.33)	0.74 (0.29–1.19)
White	0.80 (0.54–1.05)	3.03 (2.36–3.70)
Insurance		
Private	0.78 (0.51–1.05)	2.41 (1.90–2.92)
Public	0.54 (0.21–0.87)	3.59 (2.32–4.86)
None	0.21 (0–0.45)	0.65 (0.20–1.10)
Region of residence		
Northeast	0.39 (0.08–0.70)	1.66 (0.90–2.42)
Midwest	0.78 (0.43–1.13)	2.60 (1.44–3.76)
South	0.88 (0.45–1.31)	3.48 (2.52–4.54)
West	0.14 (0.02–0.26)	1.28 (0.80–1.76)

Note: Data are from the 1987 National Medical Expenditure Survey (Edwards and Berlin, 1989) and the 1996 Medical Expenditure Panel Survey (Cohen, 1997a,b). CI = confidence interval.

2.74–6.61). In 1996, the rate of stimulant use was highest among children aged 6 to 14 years (4.1%) and males (3.5%) (Table 3). An estimated 6.2% of boys in the United States between 6 and 14 years of age used a stimulant in 1996 (data not shown).

A significant increase in the rate of stimulant use was observed across genders, race/ethnicity groups, regions of the country, and among privately and publicly insured children, but not among those without insurance (Table 3). The increase in stimulant use was particularly evident for African-American children and for adolescents 15 to 18 years of age. A comparison of the rate of stimulant use by white and African-American children and adolescents (i.e., the white-black ratio) fell from 2.9 in 1987 to 1.4 in 1996. Similarly, the ratio of stimulant use between children 6 to 14 years of age and adolescents 15 to 18 years of age fell from 7.9 in 1987 to 2.7 in 1996. Although some research indicates a substantial narrowing in the male-female ratio of stimulant use during the study period (Safer et al., 1996; Zito et al., 2000), this trend was only weakly evident in NMES and MEPS data (3.4 in 1987 and 2.9 in 1996).

Antidepressants

Antidepressant medication use by children increased from 0.3 (1987) to 1.0 (1996) per 100 children and adolescents (Fig. 1). After we controlled for the sociodemographic covariates, children were 3.56 times (95% CI: 2.07–6.12) more likely to use an antidepressant in 1996 than in 1987. Between 1987 and 1996, antidepressants use increased from 0.5 to 2.1 per 100 adolescents aged 15 to 18 years. In contrast, there was no change in the rate of use by children under 6 years of age (Table 4). The male-female ratio of antidepressant medication use declined only slightly, from approximately 1.8 (1987) to 1.5 (1996). In 1996, the overall rate of selective serotonin reuptake inhibitor (SSRI) use among children and adolescents was 0.50 (0.28–0.72) and the overall rate of non-SSRI antidepressant use was 0.56 (0.38–0.74). Fluoxetine was approved by the Food and Drug Administration (FDA) in late 1987 but was not marketed in the United States until 1988. The rate of use of non-SSRI antidepressants, including tricyclics and those with atypical structures, increased from 0.28 (0.14–0.42) to 0.56 (0.38–0.74) per 100 children.

TABLE 4
National Rates of Antidepressant Use by Children and Adolescents in 1987 and 1996

	Rates of Antidepressant Use per 100 Children and Adolescents (95% CI)	
	1987	1996
Age, years		
<6	0.12 (0–.26)	0.12 (0–0.24)
6–14	0.30 (0.08–0.52)	1.06 (0.87–1.25)
15–18	0.50 (0.19–0.81)	2.12 (1.26–2.98)
Gender		
Female	0.20 (0–0.44)	0.77 (0.44–1.10)
Male	0.36 (0.12–0.60)	1.17 (0.76–1.58)
Race		
African American	0.15 (0–0.33)	0.60 (0.09–1.11)
Hispanic	0.10 (0–0.26)	0.80 (0.23–1.37)
White	0.35 (0.15–0.55)	1.16 (0.77–1.55)
Insurance		
Private	0.38 (0.18–0.58)	1.02 (0.65–1.39)
Public	0.15 (0–0.31)	1.17 (0.56–1.78)
None	0.09 (0–0.27)	0.58 (0.01–1.15)
Region of residence		
Northeast	0.08 (0–0.24)	1.34 (0.58–2.10)
Midwest	0.48 (0.11–0.85)	1.11 (0.52–1.70)
South	0.26 (0.06–0.46)	1.19 (0.72–1.66)
West	0.21 (0.13–0.29)	0.23 (0–0.47)

Note: Data are from the 1987 National Medical Expenditure Survey (Edwards and Berlin, 1989) and the 1996 Medical Expenditure Panel Survey (Cohen, 1997a,b). CI = confidence interval.

Other Psychotropic Medications

Use of psychotropic medications other than stimulants and antidepressants also significantly increased between 1987 (0.55) and 1996 (1.23) (Fig. 1). Between the two survey years, substantial increases occurred in the use of mood stabilizers (0.2 to 0.7 per 100 children) and clonidine (0 to 0.2 per 100 children). The rate of use of antipsychotic medications remained stable at 0.2 per 100 children, and the use of benzodiazepines increased only slightly, from 0.2 to 0.3 per 100 children (data not shown).

Coprescription

We examined the frequency with which children used a medication from more than one psychotropic group (stimulants, antidepressants, antipsychotics, mood stabilizers, clonidine, and anxiolytics) during the course of 1 year. Among the general population of children and adolescents, the rate of psychotropic coprescription increased from 0.03 (1987) to 0.23 (1996) ($p = .0002$). Among children who used at least one psychotropic medication, the rate of coprescription rose from 4.7 to 11.6 ($p < .03$) per 100.

In 1996, approximately one in three (33.7%) children who used antidepressant medications also used another class of psychotropic medication, and one in five (19.4%) children who used stimulants also used another class of psychotropic medication. Antidepressants were the medication most commonly coprescribed to children who used stimulants, and stimulants were the medication most commonly coprescribed to children who used antidepressants.

DISCUSSION

During the late 1980s and early 1990s, there was a dramatic increase in the use of psychotropic medications by children in the United States. The increase cut across age, racial/ethnic, geographic, gender, and insurance groups and included stimulants, antidepressants, and other psychotropic medications.

Growth in the use of stimulants, which are almost exclusively prescribed for ADHD (Safer and Krager, 1994), may reflect increasing public acceptance of these medications. An early public survey indicated a high level of public disapproval of these medications to control behavioral problems related to ADHD (Summers and Caplan, 1987). More recently, public advocacy groups have brought attention to the need to improve early recognition and appropriate pharmacologic treatment of ADHD (Barbaresi and Olsen, 1998). Increased acceptance of the role of stimulants to treat ADHD is widely believed to have enhanced recognition and treatment, especially of adolescents and younger girls with ADHD (Shalala, 2000).

A broadening of clinical concepts of stimulant-responsive psychiatric conditions may have further contributed to the increase in stimulant use. As compared with *DSM-III-R* (American Psychiatric Association, 1987), *DSM-IV* (American Psychiatric Association, 1994) reduced the number of symptoms required to meet ADHD criteria from eight to six, a subtype limited to symptoms of inattention was created, and a residual category "ADHD, not otherwise specified" was added for individuals with prominent symptoms that do not meet full ADHD criteria. These changes and the resulting prominence given to the more subjective symptoms of inattention may have contributed to clinical detection of larger numbers of children as candidates for stimulants (Safer, 2000).

There has also been a substantial increase in antidepressant use by children and adolescents. During the

1980s, childhood and adolescent depression became a topic of considerable clinical and research interest (Angold, 1988), as epidemiological data made clear that there is a sharp increase in the first onset of major depression during adolescence (Weissman et al., 1984). There is also evidence of a secular increase in the number of depressed youth (Ryan et al., 1992). However, research comparing the tricyclic antidepressants to placebo consistently indicated that these antidepressants were not efficacious in children and adolescents (Emslie and Mayes, 2001). More recently, double-blind controlled trials with fluoxetine (Emslie et al., 1997) and paroxetine (Keller et al., 2001) have yielded more encouraging results. Fluvoxamine has also shown promise in the treatment of anxious children (Research Unit of Pediatric Psychopharmacology Anxiety Study Group, 2001). In community practice, clinicians may be responding to recognized clinical needs by extrapolating from well-established research findings with adults to the clinical treatment of depressed and anxious children. However, uncertainty continues to surround the effectiveness of the newer classes of antidepressant medications in the community treatment of childhood and adolescent depression and related anxiety disorders.

The FDA approved imipramine for the treatment of childhood enuresis in 1973. It is typically prescribed during the preschool years. During the study period, antidepressant use by children under 6 years old remained unchanged. More recently, the FDA has approved the antidepressants clomipramine and fluvoxamine for the treatment of childhood obsessive-compulsive disorder. An important unresolved issue is to define the extent to which the recent increase in antidepressant use by children and adolescents is related to increases in the treatment of mood or anxiety disorders.

Once uncommon, the proportion of children who are receiving multiple psychotropic medications is increasing. In previous research, a wide range of coprescription rates have been reported from various clinical settings (Kaplan et al., 1994; Safer, 1997; Zarin et al., 1998). Without detailed clinical information, it is not possible to evaluate the safety and effectiveness of these practices. Because many children receive both antidepressants and stimulants, the clinical rationale and consequences of this practice may be a particularly important topic for practice-based research.

Previous research with claims data indicated marked racial disparities in rates of psychotropic medication use by children (Zito et al., 1998a). During the survey period, the gap in rates of psychotropic use by African-American and white children narrowed. However, African-American children remained somewhat less likely than whites to receive stimulants and antidepressants despite a lack of evidence supporting racial differences in the prevalence of ADHD or childhood depression (Fabrega et al., 1993). The sources of racial and ethnic disparities in psychotropic drug use require further study.

For the approximately one in six children in the United States without health care insurance, use of prescribed psychotropic medications remained far below that of children with coverage. The public health importance of this disparity is underscored by reports that uninsured children are at increased risk of serious emotional disturbance (Glied et al., 1997) and commonly report unmet needs for health services (Newacheck et al., 2000). Despite our great national prosperity, large numbers of uninsured children have apparently little access to psychopharmacological treatments.

Since the completion of the MEPS, the federal government has enacted the State Children's Health Insurance Program (1997) to improve health care access for uninsured children from families that do not qualify for Medicaid (Health Care Financing Administration, 2000). Over a 10-year period, the program will provide $48 billion in funding to the states. Information from the MEPS will provide a baseline against which to evaluate the success of this ambitious program.

Limitations

The current study is constrained by several limitations. Data were collected from household informants who may not be fully aware of all of the medications used by older household child and adolescent members. Stigma, recall problems, and problems distinguishing different medications also pose threats to the reporting and classification of the survey data. However, to reduce these sources of bias, the parent-informant reported data were validated by cross referencing pharmacy and physician records. Limitations in sample sizes further restricted our ability to study patterns and predictors of psychotropic drug use in smaller sociodemographic groups. No information is available from the MEPS on the medical specialties of the prescribing physicians. Perhaps most importantly, the absence of independent diagnostic data prevents us from evaluating the quality of the prescribing practices. In some cases, these medications are undoubtedly being used for the treatment of nonpsychiatric disorders, such as carbamazepine for seizure disorders.

Perspective

In recent years, a growing number of American children have used stimulants, antidepressants, and other psychotropic medications. Combining use of psychotropic medications from several classes has also become more common. A better understanding of the significance of these trends awaits large-scale community studies that include independent assessments of diagnostic status together with detailed information on treatment. Previous research, which is limited to comparatively small community samples, suggests that many children with ADHD do not receive treatment (Jensen et al., 1999b), whereas many others receive stimulants without a history of impairing ADHD symptoms, at least according to parent-provided diagnostic information (Angold et al., 2000). Despite recent increases in the use of psychotropic medications by children and adolescents, unmet need for mental health services remains great (Shalala, 2000).

An important challenge ahead lies in determining the appropriateness (and ultimately the effectiveness) of the care provided to the large number of children and adolescents who receive prescribed psychotropic medications each year. Research is needed with epidemiologically based sampling, multi-informant diagnoses with valid diagnostic tools, accurate assessments of medication and service use, evidence-based quality of care indicators, and structured outcome assessments.

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