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Annual trends in psychotropic drug prescription in American minors, 1996-2018

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Annual trends in psychotropic drug prescription in American minors, 1996-2018

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by

Alexander Recalt

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ABSTRACT OF THE THESIS

Annual trends in psychotropic drug prescription in American minors, 1996-2018

by

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Master of Science in Epidemiology
University of California, Los Angeles, 2021
Professor Susan D. Cochran, Chair

Background. Pharmacoepidemiological studies suggest that psychotropic drug prescription to US minors has increased as much as ten-fold since the 1980's. However, few have estimated nationally representative prescription trends in all psychotropic classes annually and across multiple decades. **Methods.** The Medical Expenditure Panel Survey (MEPS) tracks Americans' use of healthcare, including prescribed medicines. Here, annual MEPS data from 1996 to 2018 (n=23) were used to estimate overall and class-specific prevalence of psychotropic prescription per 100 minors aged 2 to 17 (inclusive), and to identify factors associated with any psychotropic use. **Results.** Psychotropic prescription to US minors rose from 3.5% (95% CI = 2.9%, 4.1%) in 1996 to 7.6% (95% CI = 6.7%, 8.5%) in 2018, with increases largely driven by the stimulant and antidepressant classes; girls and young women; Hispanic minors; and adolescents. Odds of psychotropic prescription in adolescents nearly doubled from 1996 (OR=8.8, 95% CI = 4.0, 19.4) to 2018 (OR=15.4, 95% CI = 9.6, 24.8).

The thesis of Alexander Recalt is approved.

Marissa Seamans

Leeka I. Kheifets

Susan D. Cochran, Committee Chair

University of California, Los Angeles

2021

Til mor, for alt.

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CHAPTER 1

Introduction & Background

1.1 Historical trends & concerns

Prescribed psychotropic drugs are a category of more than 100 chemical compounds that have been approved for sale and use by the US Food and Drug Administration (FDA) and are available by prescription (the term is used interchangeably with "psychiatric drugs" and "psychiatric medications"). They are typically used to ameliorate psychological symptoms by altering mood, behavior, and/or perception, and are considered first-line treatments for a number of psychiatric diagnoses. Prescribed psychotropics are used widely in the United States, with recent estimates of overall adult use close to 17.0% of the population [1]. Similar estimates of use in American minors are lower, but the proportions of Americans being prescribed these drugs in both populations are agreed to have risen sharply in the past three decades. Concerns about efficacy [2] and safety [3, 4] surround prescribed psychotropic use across the human lifespan, with particular concerns being unique to children.

A search conducted to assess the state of the published empirical research literature on the epidemiology of prescribed psychotropic drug use in US minors (ages 0-17, inclusive) yielded 6 published studies. (Details about searches can be found in Appendix Table 5.1.) Taken together, they suggest a substantial increase in the

overall proportion of minors who use them since the late 1980's, with the overall proportion of any psychotropic prescription increasing from approximately 1% to between 8% and 12% [5–10]. The increase has occurred in each of the 5 major prescribed psychotropic drug classes: antidepressants (ADs); antipsychotics (APs); central nervous system (CNS) stimulants and other drugs for ADHD; mood stabilizers (anticonvulsants and lithium); and anxiolytics, sedatives, and hypnotics [5, 6, 9]. This trend reflects profound social, economic, and cultural changes [9, 11].

Figure 1.1 summarizes these studies' key findings (age range across all studies: 0-20). (One study, Zito *et al.* [6], conducted separate analyses of 3 databases, and is thus included in the figure 3 times to reflect them.) All six studies retrospectively analyzed data from public, private, or mixed sources to estimate psychotropic use. The sample sizes in each individual database (8 total) ranged from 6,483 to 17.8 million US youth.

Figure 1.2 uses the same data to display the proportion of US minors receiving drugs of a given major psychotropic class over the course of the same period. (In both plots, nonlinear least squares regression lines were fitted through each level of data as a visual aid.) Together they suggest that a large proportion of the nearly ten-fold increase in the prevalence of psychotropic use in children since 1987 can be accounted for by central nervous system (CNS) stimulants (and other drugs prescribed for ADHD) and antidepressants. More US minors took anxiolytic and antipsychotic drugs in 2015 than in 1987 - some estimates show a doubling or a tripling of prevalence in these classes - but absolute increases have been relatively minor next to stimulants and antidepressants.

Despite these studies' agreement of increased overall prescription of psychiatric

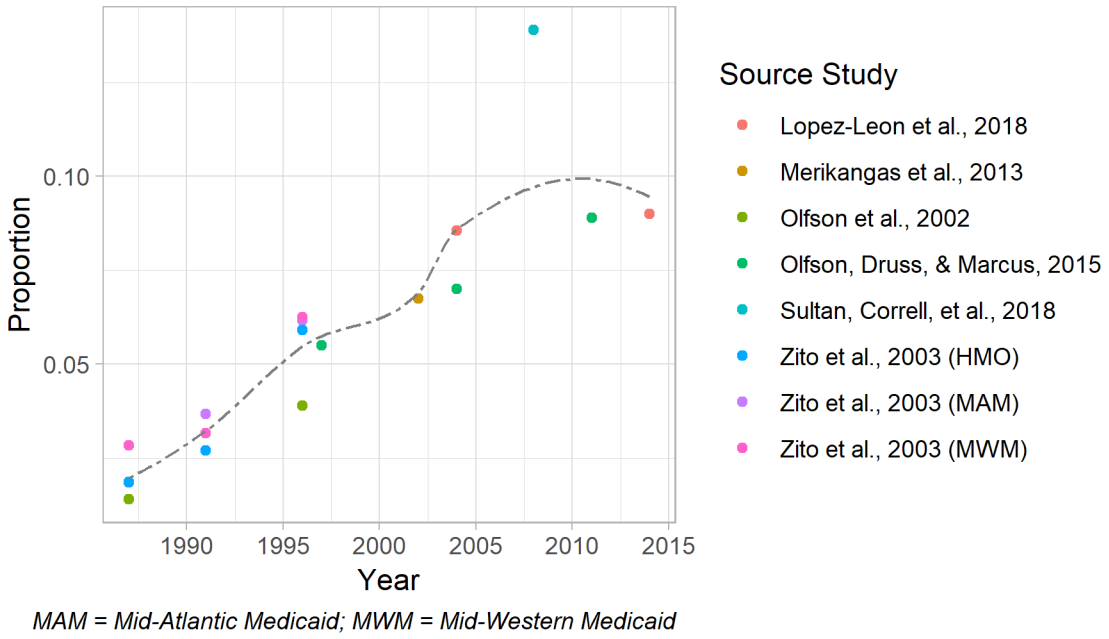

Figure 1.1: Proportion of US minors prescribed any prescribed psychotropic drug in the previous year, 1987-2015

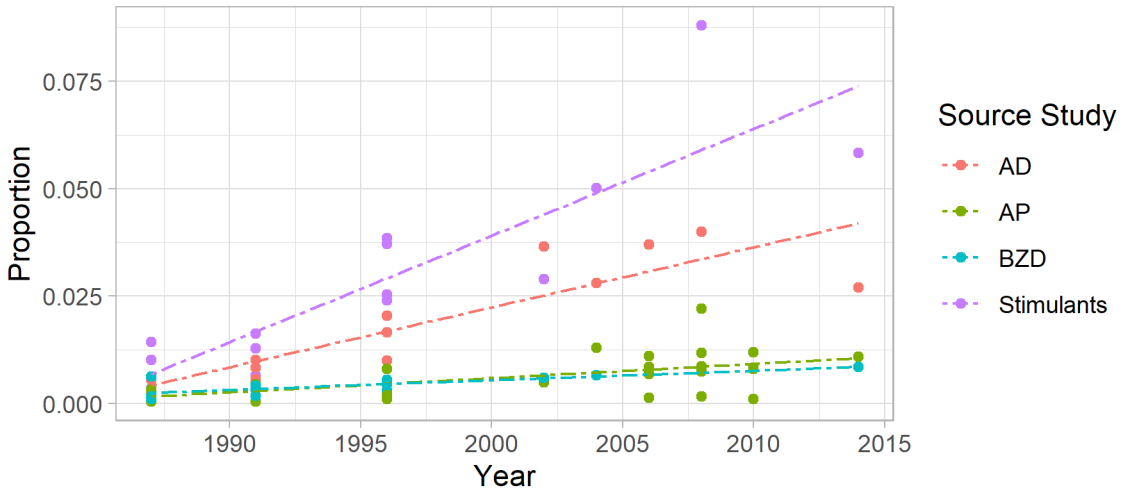

Figure 1.2: Proportion of minors prescribed psychotropic drug in the previous year (by class), 1987-2015

medications to US youth in recent decades, they differed in scope. This presents two related problems. First, beyond the estimates of overall rates shown above, direct comparisons between studies are difficult to make. Second, and perhaps more importantly, a chronologically comprehensive view of the phenomenon still eludes researchers and practitioners interested in this topic.

Table 1.1 summarizes the variation in important attributes across the 6 relevant studies found in the epidemiological literature. Of these 6, only 1 (16.7%) [6] examined more than three years of youth psychotropic use. Only half of the selected studies reported baseline sociodemographic characteristics of their study samples, though one did so partially. Most interesting, perhaps, is that few papers stratified their estimates of either overall or class-specific psychotropics use by characteristics such as age group, sex, race, and insurance type. Some did so partially - for age group but not sex, for example - but the absence is noteworthy given the importance

and widespread use of these drugs in US youth.[1]

With increased use of prescribed psychotropics, two main public health concerns have emerged. First, evidence of both effectiveness and safety of drug treatment in people under 18 is extremely limited, especially considering the drugs' widespread and frequently long-term use [4]. Second, strong and well-founded concerns exist about these drugs' potential to harm their users. Adverse drug reactions (ADRs)[12, 13] affecting numerous physiological systems (e.g. cardiovascular, nervous, metabolic) have been documented in children for all major psychotropic drug classes [14–16]. This is of special concern because children metabolize, eliminate, and respond to psychotropic drugs differently than adults [17]. While rates of serious ADRs (for instance, reactions that cause hospitalization) may be very rare ($<$ 1/10,000 users) in a given compound, the drugs' popularity and long duration of use may nevertheless translate to significant morbidity in the population: if millions of people use a given drug, a very rare adverse reaction may still affect hundreds or thousands of users.

[1]In past three decades, other researchers published pharmacoepidemiological studies of youth psychotropic use in more narrowly-defined populations. However, multiple examples of similar estimates made for different years are difficult to find.

Table 1.1: Attributes of studies estimating psychotropic use in US youth, 1987-2018

Authors	Publication Year	Years analyzed (n)	Drug classes reported (n)	Is psychotropic use in specific drugs estimated?	Are baseline sociodemographic characteristics of the same described?	For estimates of overall use, any stratification by sociodemographic characteristics?	For estimates of use by drug class, any stratification by sociodemographic characteristics?
Olfson, Marcus, Weissman, & Jensen	2002	2	3	N	Y	Y	Y
Zito, Safer, dosReis, et al.	2003	10	6	P	Y	P	P
Merikangas, He, Rapoport, Vitiello, & Olfson	2013	1	5	N	Y	N	P
Olfson, Druss, & Marcus	2015	3	5	N	P	P	P
Lopez-Leon, Lopez-Gomez, Werner, & Ruiter-Lopez	2018	2	6	Y	N	P	P
Sultan, Correll, Schoenbaum, et al.	2018	1	3	N	N	P	P

1.2 Problem statement

Investigations of prescription trends suggest that overall prescription rates have surged in US youth since the late 1980's while concerns about the effectiveness and safety of prescribed psychotropics in minors have grown alongside them. Nevertheless, the epidemiological picture of prescribed psychotropic use in American youth during the past three and a half decades remains a patchwork quilt: a semi-overlapping collection of studies investigating drug trends in different time periods, youth sub-populations, regional geographies, and drug classes which give an adequate but ultimately incomplete view of the phenomenon. Further, the most current published picture of overall youth psychotropic prescription in the US uses data from 2014. Together, these factors underscore the need for a more comprehensive and detailed view of psychotropic prescription in young Americans.

1.3 Research Questions

In this study, we addressed the following questions:

1. What proportion of US minors aged 2-17 (inclusive) described in the MEPS were prescribed any psychotropic drug annually from 1996 to 2018, the earliest and most recent years for which MEPS data are available?

2. For each MEPS year, how are minors prescribed psychotropics distributed by major prescribed psychotropic drug class, age group, sex, ethnicity, income level (as a percentage of the poverty line), health insurance type, and census region?

3. Are any of these characteristics statistically associated with the use of any prescribed psychotropic drug at the beginning (1996) and end (2018) of the years examined?

CHAPTER 2

Methods

Annual cross-sections of the Medical Expenditure Panel Survey (n = 23) were used to estimate the annual proportion of psychotropic prescription in American youth aged 2 to 17 from 1996 to 2018, regardless of indication, given overall and stratified by sociodemographic characteristics. The same data were used in multivariate logistic regression models to determine any factors associated with psychotropic prescription at the beginning (1996) and end (2018) of the study period.

2.1 Study data & population

2.1.1 The Medical Expenditure Panel Survey

The MEPS is a large-scale, nationally representative panel survey conducted annually by the Agency for Healthcare Research and Quality (AHRQ). Its broad purpose is to estimate non-institutionalized Americans' use of and expenditure on health care services [18]. Each year's MEPS data files, available publicly on the web, consist of several related components. Individuals and families, considered *households*, contribute information about demographic characteristics, health conditions and status, use of medical services, and healthcare spending on household members to the Household Component (HC). Public and private employers contribute data about

the health insurance plans they offer to the Insurance Component (IC); this includes information about premiums, plan benefits, eligibility requirements, and employer characteristics. Finally, the Medical Provider Component supplements information provided by households in the HC by surveying medical providers and pharmacies.

Households surveyed in the Household Component constitute the bulk of collected MEPS information and are a sub-sample of respondents to the previous year's National Health Interview Survey (NHIS), an ongoing annual survey of roughly 40,000 American households; these randomly selected NHIS households are interviewed in the MEPS in greater depth. In terms of survey design, the MEPS is a *panel* survey in that selected households are surveyed and interviewed on at least two separate occasions [19]; households are typically interviewed at five times over the course of their participation in the MEPS, primarily over the phone. MEPS panels are rotated, as well. Each panel is included for two years, so that a given year's MEPS data is sourced from two panels. For example, the 1997 Household Component contains 8200 households selected into the 1996 MEPS and carried forward through 1998, along with a new panel of 6,000 households randomly sampled from the 1996 NHIS [18].

2.1.2 Prescribed psychotropic drug use

In MEPS interviews, survey respondents representing each household are asked to provide the names of any prescribed drugs or medications used by any household member during the period being inquired about. MEPS staff then implement verification procedures, first asking respondents for consent to contact medical providers and pharmacies to confirm acquisition of any medications reported by the house-

hold, in addition to other drug attributes (e.g. drug form, National Drug Code (NDC), dose, quantity; [20]). Prescription drug information is then stored in each year's MEPS Prescribed Medicines Files, linked to individual household members by unique dwelling unit ID code (e.g. *DUPERSID*).

2.2 Study design

In this study, prescribed psychotropic drug use in US minors aged 2 to 17 was described retrospectively, using a cross-sectional design for each of the 23 MEPS years from 1996 to 2018 (inclusive), aggregating the prevalence of prescribed psychotropic use in each cross-section's respondent cohort to describe drug utilization longitudinally.[1] To streamline the MEPS's complex organization, the Household Component and Prescribed Medicines data files for each year from 1996 to 2018 were merged on unique household member ID number (*DUPERSID*), resulting in a single file for each year.

2.3 Variables

Table 2.1 summarizes the variables used in analyses of youth psychotropic use. Variable names in the table are from the 1996 MEPS. Study outcomes (any psychotropic prescription; psychotropic prescription by drug class) are contained in MEPS Pre-

[1]A note on nomenclature: in this study, the noun *minor(s)* will be the primary one used to refer more succinctly to the population of Americans aged 2 to 17 under study. In some instances, however, the noun *youth* is also used to refer to the same group, while *children* and *teenagers* or *adolescents* are used to refer to 2 of 3 major age groupings used in our analyses: minors aged 6-12 and 13-17, respectively.

scribed Medicines files, each of which contains verified prescription drug data categorized by Multum Therapeutic Classification (TC) code.

2.4 Analyses

2.4.1 Estimates of the prevalence of psychotropic use

To make valid national estimates of youth prescribed psychotropic use and corresponding variances, we specified the appropriate primary sampling units (PSUs), survey strata, and person-level survey weights, all of which are included in each year's MEPS data files and described in survey documentation. Additionally, specifications were made in statistical analysis to ensure valid standard errors using the Taylor series linearization approach specified in the MEPS documentation [21].

2.4.2 Logistic regression modeling of psychotropic prescription on sociodemographic covariates

To assess whether sociodemographic covariates were associated with psychotropic use, and whether any such associates changed from the beginning to the end of the study period, we fit logistic regression models of binary (none = 0, any = 1) psychotropic prescription on variables from the 1996 and 2018 MEPS years [22, 23].

$$logit[p(Rx)] = \alpha + \beta_1 \text{Class} + \beta_2 \text{Agegrp} + \beta_3 \text{Sex} + \beta_4 \text{Race} + \beta_5 \text{Inc} + \beta_6 \text{Ins} + \beta_7 \text{Region} + \beta_8 \text{Hisp} \tag{2.1}$$

Coefficients can be interpreted as the expected change in the logit risk of psychotropic prescription for each 1-unit increase in β_k, or between two subgroups of β_k that differ by 1. Taking e^{β_k} yields the odds ratio of psychotropic prescription vs. no

Table 2.1: Analysis variables, MEPS 1996-2018

Variable name*	Description	Data type	Value Labels
TC1	Multum Therapeutic Classification code	numeric	e.g. 242 = Psychotherapeutc agents
TC1S1	Multum Therapeutic Subclassification code	numeric	e.g. 71 = CNS Stimulant
AGE1X	Age	numeric	0 - 90
SEX	Sex	numeric	1 = Male 2 = Female
RACEX	Race	numeric	1 = American Indian 2 = Aleut, Eskimo 3 = Asian or PI 4 = Black 5 = White 91 = Other
HISPANX	Hispanic status	numeric	1 = Not Hispanic 2 = Hispanic
POVCAT	Family income as a percentage of poverty line	numeric	1 = Negative or poor (<100% PL) 2 = Near poor (100-124%) 3 = Low income (125-199%) 4 = Middle income (200-399%) 5 = High income (≥400%)
INSCOV96	Health insurance coverage indicator	numeric	1 = Any private health insurance 2 = Person only had public insurance 3 = Person was uninsured
REGION96	Census region at year end	numeric	-3 = No data 1 = Northeast 2 = Midwest 3 = South 4 = West

* Variable names are taken from the 1996 MEPS and change slightly in successive years.

psychotropic prescription in β_k.

All survey design specification, statistical analysis, and data visualization were conducted in R, in particular the survey and ggplot2 packages [24–27].

2.4.3 Missing data

Generally, the analytic weights provided in each MEPS year's public use files (PUFs) account for survey non-response, and their correct use in statistical analysis yields unbiased population estimates of healthcare use and expenditure. In many cases, variables in MEPS PUFs use weighted sequential hot-deck imputation to impute missing values [28]; such variables are marked "(EDITED / IMPUTED)" in MEPS variable labels and in many cases are available for use alongside the non-imputed versions. Built-in imputation of this sort is most prominent in variables related to costs and expenditures, but applies in other instances as well. In this analysis, we used the imputed versions of some variables (for instance, race/ethnicity and Hispanic status variables.[2]

2.5 Institutional review board

Because the MEPS consists of freely available and de-identified health data, the UCLA Institutional Review Board (IRB) determined that this study does not meet

[2]In published studies of healthcare use and expenditure based on MEPS data, some researchers do not address missing data or item non-response [29, 30], seemingly relying on MEPS datafiles, analytic weights, and pre-made imputed variables as made available for public use. Others address missing data by dropping cases, either justifying the decision after a assessing a low likelihood of bias due to little missingness in variables of interest [31], or by making any missingness in variables of interest a criterion for exclusion from analysis [32].

the definition of human subjects research and granted it an exemption from IRB review on April 21st, 2021 (Protocol ID: IRB21-000695).

CHAPTER 3

Results

3.1 Sample characteristics

Table 3.1 presents the background characteristics of the MEPS cross sections from 1996, 2007, and 2018. (Sample characteristics for all 23 years in this analysis ca be found in Appendix Tables 5.2, 5.3, 5.4, and 5.5.) The weighted estimate of American minors increased by 2.2m from 1996 to 2018 (67.6m to 68.8m), an interval during which the population of Hispanic minors (9.9m to 18.0m) and minors on public health insurance plans only (13.6m to 25.1m) nearly doubled. A smaller but sizable increase was seen in the number of minors in the wealthiest household income bracket (expressed as a percentage of the poverty line; 15.6m in 1996 to 21.7m in 2018). The number of minors with no health insurance fell from 7.1m to 1.8m in the same period, a decrease likely accounted for by the passage of the Affordable Care Act (ACA) in 2010.

3.2 Trends in psychotropic prescription, 1996-2018

Estimates of overall psychotropic prescription in the population of US minors during the study period are represented by the black line in Figure 3.1, where it sits

Table 3.1: Characteristics of US minors aged 2-17, MEPS 1996, 2007, & 2018

Characteristic	1996	2007	2018
No. of minors, millions	67,656,845	69,591,538	69,884,307
Age, mean (SE)	9.0 (0.1)	9.1 (0.1)	9.1 (0.1)
Age category			
2 - 5	12,072,101	11,851,870	12,319,554
6 - 12	23,931,895	24,221,177	24,471,864
13 - 17	16,015,261	17,203,791	17,158,568
Sex			
Male	34,990,470	35,160,028	35,721,872
Female	32,666,375	34,431,510	34,162,434
*Race / ethnicity**			
American Indian	935,075		
Aleut or Eskimo	88,488		
Asian or Pacific Islander	2,498,756		
Black	11,227,306	10,455,763	10,269,867
White	52,816,719	53,213,867	50,452,278
Am. Indian or AK Native		688,827	569,896
Asian		2,605,094	4,067,724
Native Hawaiian or PI		325,072	0.00
Multiple races reported		2,302,913	4,524,541
Hispanic			
Hispanic	9,866,745	14,601,594	18,034,011
Income (% of poverty line)			
$<$ 100%	13,930,543	12,765,622	11,315,855
100-124%	3,651,998	3,527,509	4,166,294
125-199%	11,418,492	10,593,566	10,984,392
200-399%	23,025,690	22,264,541	21,743,970
$\geq$ 400%	15,630,123	20,440,298	21,673,794
Health insurance type			
Any private insurance	46,958,449	42,417,412	42,885,729
Public insurance only	13,587,041	21,935,973	25,169,870
Uninsured	7,111,355	5,238,151	1,828,707
Census region			
Northeast	12,380,326	11,342,730	11,076,722
Midwest	16,100,381	15,398,101	14,586,844
South	23,296,771	25,781,983	27,261,806
West	15,879,367	17,068,722	16,958,934

* Race / ethnicity categories were changed beginning in the 2002 MEPS.

alongside colored lines representing each drug class. In all figures, the light gray areas surrounding each trend line represent 95% confidence intervals for each point estimate. From 1996 to 2018, overall psychotropic use per 100 minors reported by MEPS households rose from 3.5% (95% CI = 2.9%, 4.1%) to 7.6% (95% CI = 6.7%, 8.5%), with a small reduction in the proportion of overall use driven by reductions in CNS stimulant and antidepressant use in 2015 and 2016.

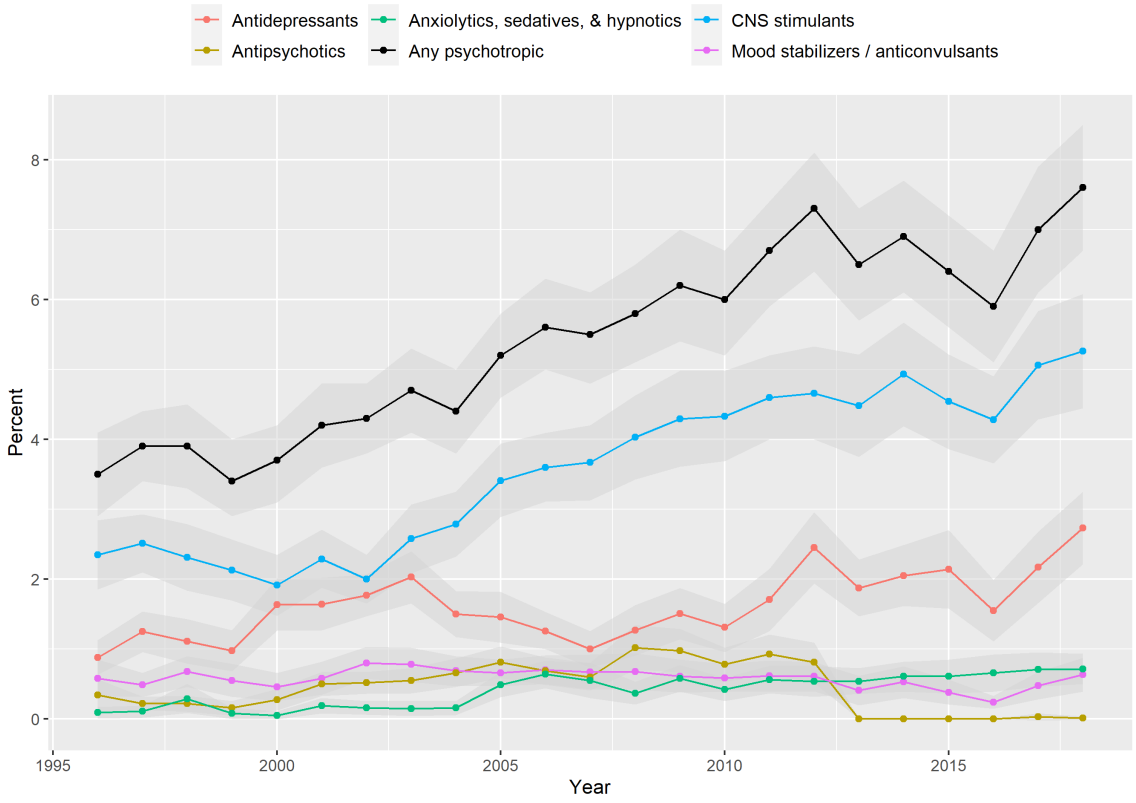

Figure 3.1: Overall and class-wise psychotropic prescription in US minors, MEPS 1996-2018

Table 3.2: Overall and class-wise psychotropic prescription per 100 US minors, MEPS 1996, 2007, & 2018

Characteristic	1996	2007	2018
Any psychotropic	3.5 (2.9, 4.1)	5.5 (4.8, 6.1)	7.6 (6.7, 8.5)
Psychotropic drug class			
CNS stimulants	2.3 (1.9, 2.8)	3.7 (3.1, 4.2)	5.3 (4.4, 6.1)
Antidepressants	0.9 (0.6, 1.1)	1.0 (0.7, 1.3)	2.7 (2.2, 3.2)
Mood stabilizers / anticonvulsants	0.6 (0.3, 0.9)	0.7 (0.4, 0.9)	0.6 (0.4, 0.9)
Antipsychotics	0.3 (0.1, 0.6)	0.6 (0.4, 0.8)	0.0 (0.0, 0.0)
Anxiolytics, sedatives, & hypnotics	0.1 (0.0, 0.2)	0.6 (0.3, 0.8)	0.7 (0.5, 0.9)

3.2.1 Drug classes

Figure 3.1 plots psychotropic prescription by major drug class from 1996 to 2018, and Table 3.2 tracks any psychotropic use and use by drug class as a proportion on MEPS minors aged 2-17 for 1996, 2007, and 2018 (Appendix Tables 5.6, 5.7, 5.8, and 5.9 do so for each of the 23 years under study). CNS stimulants represent the most common psychotropic subclass given to minors throughout the study period, but their proportion of use among all included minors nonetheless more than doubled, rising from 2.3% (95% CI = 1.9%, 2.8%) to 5.3% (95% CI = 4.4%, 6.1%). Of the other 4 classes, only antidepressants saw a pronounced increase across the study period, tripling from 0.9% (95% CI = 0.6%, 1.1%) of all youth in 1996 to 2.7% (95% CI = 2.2%, 3.2%) in 2018. Noteworthy is the sudden fall to zero of antipsychotic use in minors beginning in 2013; this is due to statistical disclosure limitations in the MEPS.

3.2.1.1 Drug class distribution by age group, sex, and Hispanic status

Stratifying the distribution of drug classes as a proportion of all minor psychotropic users on age, sex, and Hispanic status further clarifies these trends. Figure 3.2 shows that while the each drug class's share of psychotropic users remained fairly consistent in the 2-5 and 6-12 age groups, antidepressant (AD) and CNS stimulant use rose substantially in the 13-17 age group, suggesting that the rise in overall psychotropic prescription to adolescents may largely be driven by these two drug classes. A

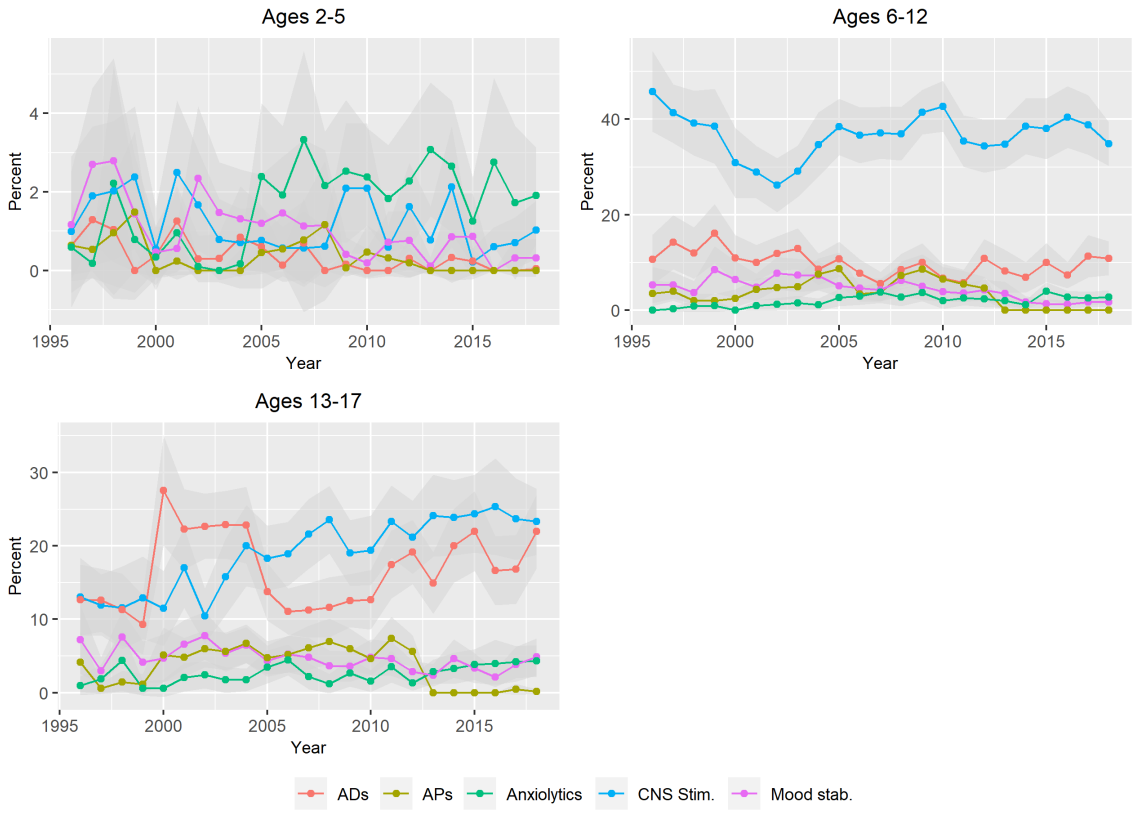

Figure 3.2: Distribution of drug classes in prescribed psychotropic users by age group, MEPS 1996-2018

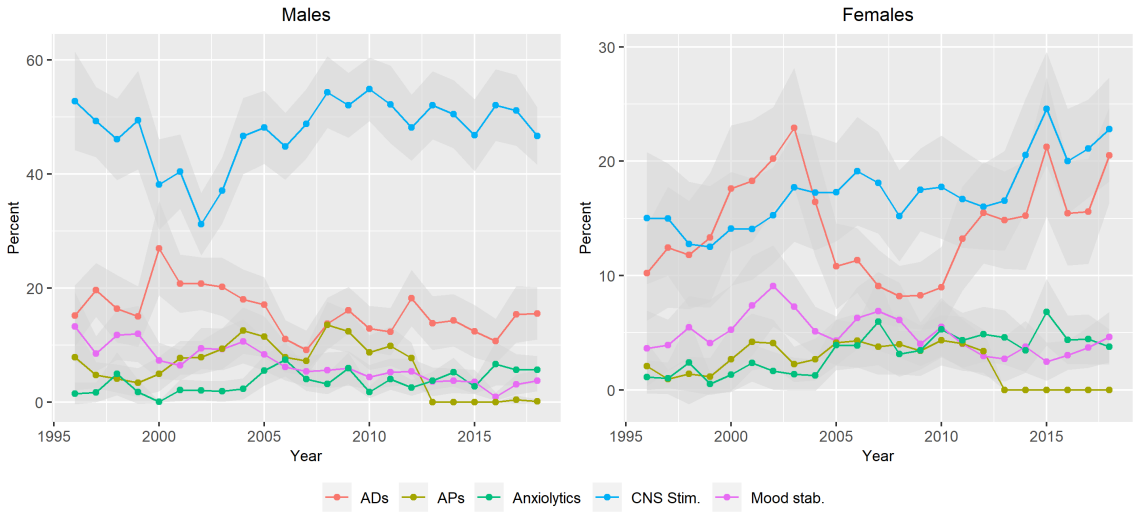

Figure 3.3: Distribution of drug classes in prescribed psychotropic users by sex, MEPS 1996-2018

similar dichotomy is seen in Figure 3.3, where psychotropic drugs are stratified by class and sex as a proportion of all psychotropic users aged 2 to 17. In the plot on the left-hand side, we see the proportion of males with any psychotropic mostly driven by CNS stimulant use, holding at approximately 50% throughout the study period save for a brief decline in the early 2000's. In female psychotropic users, however, a sharp increase in the proportion of antidepressant and stimulant use is evident, with antidepressants doubling from 10.2% (95% CI = 6.1%, 14.4%) to 20.5% (95% CI = 16.4% 24.7%) over 23 years and CNS stimulants nearly following suit, rising from 15.0% to 23.0%. Hispanic minors underwent similar growth in drug classes. Figure 3.4 shows CNS stimulant use increasing from 2.9% (95% CI = 1.1%, 4.7%) to 10.3% (95% CI = 6.5%, 14.2%) and antidepressant use rising from 2.6% (95% CI = 0.6%, 4.6%) to 5.6% (95% CI = 3.1%, 8.1%) while other classes' proportions remain small and stable throughout.

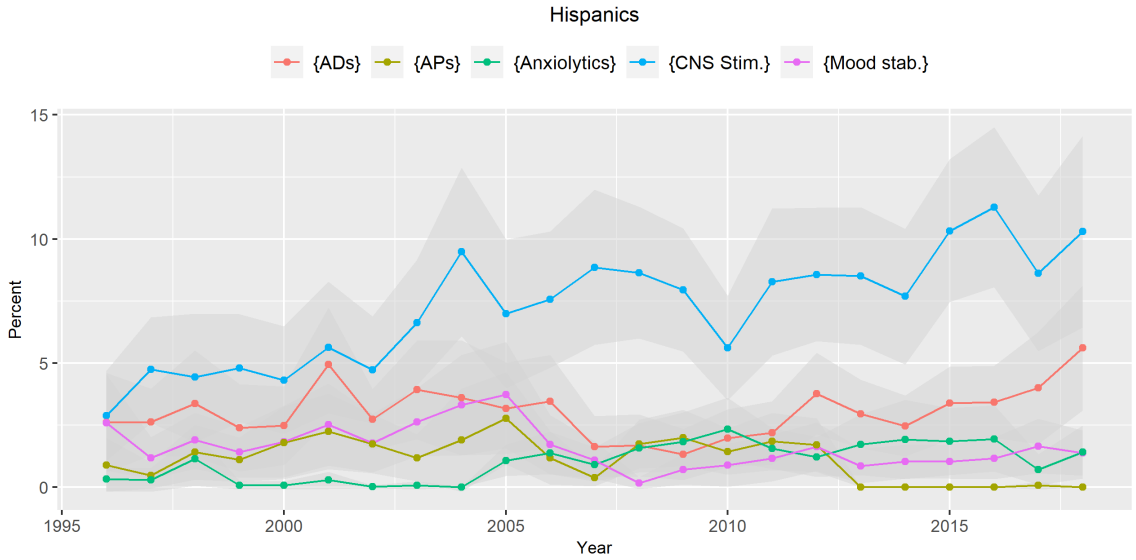

Figure 3.4: Distribution of drug classes in Hispanic minor prescribed psychotropic users, MEPS 1996-2018

3.3 Annual psychotropic prescription stratified by sociodemographic characteristics

Figure 3.5 displays the levels of 7 sociodemographic categories as a proportion of MEPS minors aged 2-17 who were prescribed any psychotropic drug in each study year, and Table 3.3 summarizes the same information numerically at the beginning, middle, and end of the study period.

The proportion of minors with psychotropics aged 6-12 fell from 56.6% (95% CI = 48.3%, 64.8%) in 1996 to 41.4% (95% CI = 36.6%, 46.1%) in 2018, a decline mirrored nearly perfectly by the commensurate rise in the proportion of adolescents (ages 13-17). They were 28.2% (95% CI = 21.7%, 34.8%) of psychotropic users in 1996 but 41.9% (95% CI = 36.7%, 47.1%) in 2018.

The proportion of Hispanic youth psychotropic users (versus non-Hispanics) rose from 1996 to 2018, beginning at 7.6% (95% CI = 4.6%, 10.6%) ending at 15.4% (95% CI = 11.1%, 19.6%). Other racial or ethnic categories' share of representation in young psychotropic users remained fairly stable, with whites representing an outsize majority (approximately 80.0%) of users throughout the study period.

Table 3.3: Sociodemographic characteristics of US minors prescribed any psychotropic drug, MEPS 1996, 2007, & 2018

Characteristic	1996	2007	2018
Age category			
2 - 5	3.1 (0.52, 5.7)	6.06 (3.02, 9.1)	3.3 (1.8, 4.8)
6 - 12	56.6 (48.3, 64.8)	46.7 (41.4, 51.9)	41.4 (36.6, 46.1)
13 - 17	28.2 (21.7, 34.8)	36.6 (30.9, 42.3)	41.9 (36.7, 47.1)
Sex			
Male	73.8 (67.6, 80.4)	61.85 (56.0, 67.7)	59.1 (54.3, 63.9)
Female	26.2 (19.6, 32.8)	38.2 (32.3, 44)	40.9 (36.1, 45.7)
*Race / ethnicity**			
American Indian	0.9 (-0.13, 1.9)		
Aleut or Eskimo	0.0 (0.0, 0.0)		
Asian or Pacific Islander	2.5 (-1.2, 6.2)		
Black	12.8 (6.9, 18.7)	14.11 (9.8, 18.4)	12.7 (9.1, 16.3)
White	83.8 (77.2, 90.5)	80.09 (75.2, 84.9)	78.9 (74.2, 83.7)
Am. Indian or AK Native		0.4 (-0.23, 1)	0.9 (0.1, 1.8)
Asian		1.2 (0.15, 2.3)	1.3 (0.2, 2.5)
Native Hawaiian or PI		0.4 (-0.42, 1.3)	0 (0, 0)
Multiple races reported		3.8 (1.96, 5.6)	6.1 (3.4, 8.7)
Hispanic			
Hispanic	7.6 (4.6, 10.6)	11.7 (8.38, 15)	15.4 (11.1, 19.6)
Income (% of poverty line)			
$< 100\%$	17.2 (11.7, 22.7)	16.5 (12.36, 20.7)	18.3 (13.9, 22.6)
100-124%	6.2 (2.5, 9.8)	5.1 (3.1, 7.2)	5.8 (2.2, 9.4)
125-199%	15.1 (7.9, 22.2)	17.3 (12.2, 22.4)	14.1 (10.4, 17.7)
200-399%	37.2 (28.5, 45.9)	30.1 (24.1, 36.2)	25.9 (20.9, 31)
$\geq 400\%$	24.3 (17.1, 31.5)	30.9 (24.9, 36.9)	35.9 (29.2, 42.5)
Health insurance type			
Any private insurance	70.8 (63.5, 78)	64.4 (58.4, 70.4)	63.6 (57.8, 69.4)
Public insurance only	25.5 (18.1, 32.9)	30.7 (25.1, 36.3)	35.3 (29.6, 41)
Uninsured	3.7 (1.2, 6.2)	4.9 (1.7, 8.2)	1.1 (0.0, 2.1)
Census region			
Northeast	16 (9.29, 22.6)	14.8 (10.4, 19.2)	17.7 (13.0, 22.4)
Midwest	27.8 (18.7, 37.0)	24.7 (18.4, 31)	27.2 (21.4, 33)
South	43.1 (33.9, 52.3)	39.9 (33.5, 46.3)	35.9 (29.6, 42.2)
West	13.1 (7.5, 18.7)	20.6 (15.4, 25.8)	19.2 (12.8, 25.6)

* Race / ethnicity categories were changed beginning in the 2002 MEPS.

3.4 Factors associated with psychotropic prescription in 1996 and 2018

Odds ratios (ORs) from multivariate logistic regression models for binary drug use in 1996 and 2018 are given in Table 3.4. Compared to minors aged 2-5, the odds of psychotropic prescription in children aged 6-12 and adolescents aged 13-17 was significantly higher in 1996, with ORs of 10.5 (95% CI = 5.0, 21.8) and 8.8 (95% CI = 4.0, 19.4), respectively. While the OR for children 6-12 was similar in 2018 (OR = 9.4, 95% CI = 6.0, 14.9), it nearly doubled in adolescents over the same interval, reflecting increased annual prevalence of use in this population identified above (OR = 15.4, 95% CI = 9.6, 24.8). Relative to whites, whose rates of psychotropic prescription far outweighed any other single racial or ethnic group's throughout the MEPS years under study, black minors remained at similarly and significantly lower odds of psychotropic prescription in both logistic regression models (1996 OR = 0.5, 95% CI = 0.3, 0.8; 2018 OR = 0.6, 95% CI = 0.4, 0.8). Similar odds of psychotropic prescription were seen in Hispanics, with odds significantly lower relative to non-Hispanic minors (1996 OR = 0.5, 95% CI = 0.3, 0.9; 2018 OR = 0.4, 95% CI = 0.3, 0.6). Finally, while the odds of psychotropic prescription were significantly higher in minors exclusively insured by public programs relative to privately-insured minors in 1996 (OR = 2.3, 95% CI = 1.4, 3.8), the same comparison was yielded a non-significant OR in 2018 (OR = 1.1, 95% CI = 0.7, 1.6).

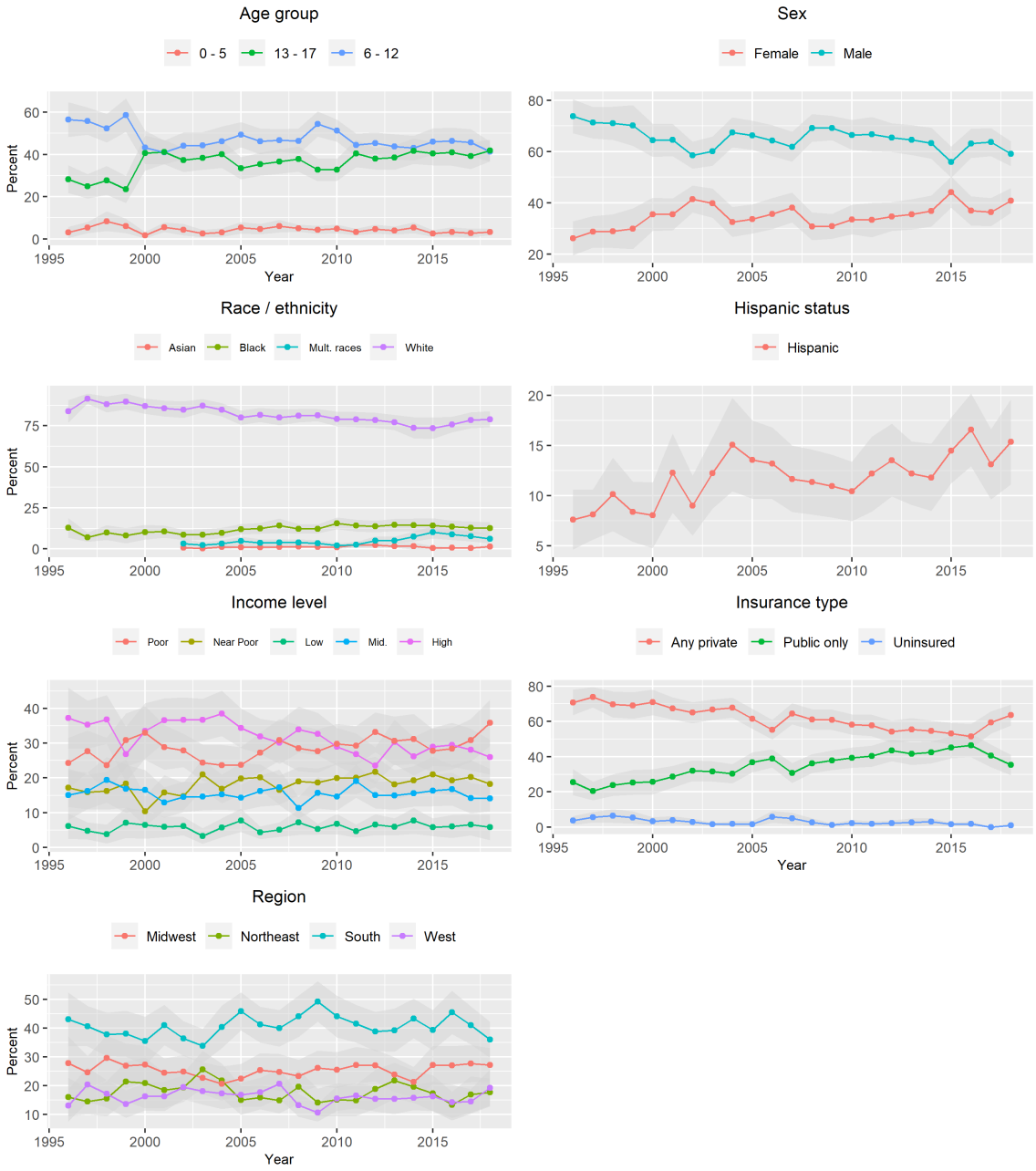

Figure 3.5: Sociodemographics as a proportion of minors prescribed any psychotropic

Table 3.4: Odds of any prescribed psychotropic use, MEPS 1996 & 2018

Term	1996	2018
Age category		
2 - 5 (Reference)		
6 - 12	10.5 (5.0, 21.8)***	9.4 (6.0, 14.9)***
13 - 17	8.8 (4.0, 19.4)***	15.4 (9.6, 24.8)***
Sex		
Male (Reference)		
Female	0.4 (0.3, 0.5)***	0.7 (0.6, 0.9)**
Race / ethnicity		
White (Reference)		
Black	0.5 (0.3, 0.8)**	0.6 (0.4, 0.8)**
Aleut or Eskimo	0.0 (0.0, 0.0)***	
Asian or Pacific Islander	0.8 (0.2, 3.9)	
American Indian	0.6 (0.2, 2.4)	
Other Races	0.0 (0.0, 0.0)***	
Am. Indian or AK Native		1.2 (0.4, 3.3)
Asian, Ntv. Hawaiian, or P.I.		0.2 (0.1, 0.4)***
Multiple Races		0.8 (0.5, 1.3)
Hispanic		
Not Hispanic (Reference)		
Hispanic	0.5 (0.3, 0.9)*	0.4 (0.3, 0.6)***
Income (% of poverty line)		
$<$ 100% (Reference)		
100-124%	1.6 (0.8, 3.2)	0.8 (0.4, 1.5)
125-199%	1.4 (0.8, 2.5)	0.7 (0.5, 1.1)
200-399%	1.5 (0.9, 2.6)	0.6 (0.4, 0.9)*
$\geq$ 400%	1.4 (0.8, 2.6)	0.8 (0.5, 1.3)
Insurance type		
Any private insurance (Reference)		
Public insurance only	2.3 (1.4, 3.8)**	1.1 (0.7, 1.6)
Uninsured	0.4 (0.2, 0.8)*	0.4 (0.2, 1.0)
Census region		
Northeast (Reference)		
Midwest	1.3 (0.7, 2.4)	1.1 (0.8, 1.7)
South	1.6 (1, 2.7)	0.9 (0.6, 1.2)
West	0.7 (0.4, 1.2)	0.8 (0.5, 1.3)

Significance codes: * = 0.05 | ** = 0.01 | *** = 0.001

CHAPTER 4

Discussion

This study further bolsters previous efforts that suggested a pronounced increase in psychotropic prescription to American minors in the last several decades. Its primary contribution is to extend these efforts by giving detailed insight into the pharmacological and sociodemographic factors that underlie this growth. MEPS data analyzed here suggest that the trend has been driven by increases in CNS stimulant and antidepressant use in females and Hispanics, as well as overall psychotropic use in girls and young women, Hispanic youth, and adolescents.

The overall finding that the prescription of any psychotropic drug to Americans aged 2 to 17 (inclusive) increased from 3.5% (95% CI = 2.9%, 4.1%) to 7.6% (95% CI = 6.7%, 8.5%) is one of the lower such estimates of the growth of psychotropic use in pharmacoepidemiological studies in the last decade. However, contact with AHRQ staff revealed that the confidentiality restrictions and statistical disclosure limitations which exist in MEPS public use data files apply to data on antipsychotic use in minors (Personal communication, June 1, 2021). As a result, beginning in MEPS year 2013 and continuing for the rest of the study period, estimates for this stratum are null. Having the true AP estimates may have yielded higher estimates of overall use, and future work on this dataset will endeavor to include them by applying to AHRQ for access to restricted use data.

Previous researchers [9] working with data from 2004 and 2014 showed a slowing down of overall psychotropic prescription rates in US children and adolescents after an increase from the 1980's to 1990's. They argued that the global perception of ever-increasing prescription is not valid anymore (p. 9). Our analysis, which used more recent MEPS data from 2015 to 2018, suggests that these claims may merit moderate attenuation, suggesting continued (though potentially slower) overall growth past 2014.

Few published studies have investigated the epidemiology of antidepressant or stimulant prescription in girls; a recent EMBASE search of the worldwide medical literature for terms relating to "psychiatric medication" and "girls" yielded no results, and a similar search for "girls" and "antidepressants" or "stimulants" yielded a small handful of relevant studies out of 13 search results. In suggesting a pronounced increase since the 1990s, this study makes research on this subpopulation much more urgent, as the underlying reasons for the increase are unknown. While female youth still had lower odds of psychotropic prescription in 2018 compared to male youth, these odds still rose from 1996 to 2018, narrowing the gap. This growth needs greater scrutiny.

Our suggestion of increased antidepressant (AD) prescription in teenagers, female youth, and Hispanic youth across 23 years is surprising in light of the US Food and Drug Administration's series of communications and warnings in the mid-2000's about the potential for serious adverse drug reactions when using these compounds in children and teens [33–36]. In October of 2004, the FDA issued a black-box warning for all antidepressant drugs, having found that they were associated with increased suicidal thinking and behavior in children and adolescents [37]. Our analysis of MEPS data identifies an overall decrease in antidepressant prescription in

the immediate years following the warning, as well as decreases for male and female minors, Hispanic minors, and adolescents; this aligns with other research into antidepressant prescription in the wake of the FDA's announcement [35, 38]. But each of these attributes, and for overall rates among youth, our study not only suggests a recovery to pre-warning levels but a substantial increase above them. Overall AD prescription in youth tripled from 1996 (0.9%) to 2018 (2.7%). While some argue that the "dip" in AD prescription after the FDA warning merits concerns about child and adolescent depression going untreated, we believe that the overall increase identified in this MEPS analysis is as much or more concerning. Given the numerous calls for more and higher quality safety research in prescribed psychotropic use in youth [39–44] and the limited evidence of effectiveness for short- or long-term psychiatric drug treatment in this population [2, 3], pharmacoepidemiologists are on solid ground in looking further into this trend. Such efforts would fit squarely into the ethical obligations of epidemiologists and pharmacoepidemiologists to maximize the potential benefits of research to society [45] and facilitate transparency and integrity in research conduct [46].

4.1 Limitations

This project's central limitation is that the estimates of antipsychotic use in minors beginning in 2013 are zero, because of statistical disclosure limitations in the MEPS that result in certain records being masked, overwritten, or collapsed into other categories. As a result of this obscurity, overall and stratified estimates of prescribed psychotropic use from 2013 to 2018 are also potentially under-counted.

Using the MEPS for pharmacoepidemiological estimates of drug trends has limi-

tations. First, the surveys do not fully generalize to the entire US population because they exclude institutionalized Americans, the incarcerated and those in assisted living facilities among them. While a study of prescription patterns in children may be less sensitive to these drawbacks, the estimates presented here still exclude incarcerated youth, an understudied population of particular interest to researchers of psychotropic prescription because of the coercive nature of the environment: minors in youth detention centers may be more likely to receive an atypical antipsychotic or a sedative, for instance, for "acting out" [47, 48]. Importantly, the MEPS lacks data on prescriber specialty, denying this analysis an important variable on which to stratify.

This study did not investigate psychiatric polypharmacy, the concurrent use of more than one prescribed psychotropic drug. One study [49] indicated that 27.3% of youth prescribed any psychotropic drug are prescribed more than one. Evidence for the effectiveness of psychotropic polypharmacy is lacking, and there is both evidence and acknowledgment among researchers that in children, the practice is harmful, leading to increased rates of adverse drug events [50–52].

4.2 Conclusion

This study's findings of continued overall growth in psychotropic prescription to American minors - as well as substantial growth in several sociodemographic categories - shine needed light on a group of prescription drugs of questionable efficacy and safety in widespread and long-term use. Further research into recent prescribed psychotropic use in girls, adolescents, and Hispanics is urgently needed.

CHAPTER 5

Appendix

5.1 Literature search

To assess the state of the published empirical research literature on the epidemiology of prescribed psychotropic drug use in US youth, I searched Embase, PsycINFO, Pubmed, Google Scholar, and bibliographic sources for studies that investigated the topic. (Appendix Table 5.1 summarizes the components of those searches.) Inclusion criteria were studies that a) sought to estimate *overall* prescribed psychotropic use, regardless of indication (and not just, for example, psychotropic use within a specific subpopulation, e.g. foster youth), and b) looked at US youth aged 0 to 18. Six eligible studies were found, ranging in publication year from 2002 to 2018. The earliest year of analysis was 1987, and the most recent was 2014.

5.2 Drug categories

In epidemiological investigations of prescribed psychotropic use, researchers often make use of psychotropic categories to present information to the reader in more succinct form; with many dozens of prescribed psychotropics authorized for use in the US in the past century, comprehensively reporting the use of each of these com-

Table 5.1: Keywords used in literature searches, by category

Keyword Type	Examples	Keywords used (n)
Synonyms of 'prescribed psychotropic drugs'	psychiatric drug, psychiatric medication, prescribed psychotropics	5
Names of drug categories	antipsychotic, antidepressant, stimulant, drugs for ADHD	15
Synonyms of 'youth'	youth, child, early life, kid, minor	13
Names of investigations of drug use trends	epidemiology, trend, prevalence, practice patterns	7
Exclusion terms	mouse, mice, rat, animal model, scale, addict	5

pounds would make for very lengthy publications and reports. When talking about psychiatric medications, clinicians and researchers typically use five "major" categories: antidepressants; antipsychotics; stimulants (alternatively referred to as "psychostimulants", "drugs used in the treatment of ADHD", or central nervous system stimulants, as in the MEPS); anxiolytics (anti-anxiety drugs, a group of which benzodiazepines such as alprazolam are a large proportion); and mood stabilizers (a category consisting, on the one hand, of lithium, a naturally occurring mineral, and anti-seizure drugs like carbamazepine on the other). Sedative and hypnotic classes are often - but not always - grouped with anxiolytics, as is the case in the MEPS data analyzed in this study.

Efforts at categorization necessarily require subjective decisions to be made about inclusion in a given group, an exercise made all the more difficult by the frequent off-label use of drugs — the use of a pharmaceutical for a condition or indication not approved by a regulatory body. In some instances, a drug used in non-psychiatric contexts is employed in the treatment of psychiatric conditions (see e.g. anti-seizure medications originally used in neurology being employed as anti-manic "mood stabilizers" in bipolar disorder), and in others this "borrowing" occurs across different psychiatric categories (for instance, many antipsychotic drugs are used - and, importantly, are referred to - as mood stabilizers or as having mood-stabilizing effects. The most difficult cases arguably arise when extremely popular drugs like diphenhydramine, popularly known as Benadryl and sold over the counter (OTC) in the US, earn a psychiatric application. In this instance, diphenhydramine's calming or sedating effects are employed against anxiety and panic in psychiatric settings. Diphenhydramine is an antihistamine, and despite its OTC status is still prescribed millions of times per year. Does one include diphenhydramine as an anxiolytic when

estimating drug trends in that major category of psychiatric drugs? If yes, one might report substantially higher proportion of anxiolytic use in a population than similar studies, which may in turn earn understandable (and valid) critique. If no, however, we may paint an inaccurate picture of prescribed psychotropic drug use.

In projects like like this one, which employ secondary data to estimate trends in drug use in large populations, decisions about categorization are not often made explicit by study authors in published work. In our case, the MEPS builds into its prescription drug data a proprietary classification system created by the Cerner Corporation, a Missouri firm that supplies health information technology services. Its Multum Therapeutic Classification codes build in their own assumptions about membership in psychiatric drug classes; moreover, these groupings have changed over time. Early in the analytical stages of this project, we discovered that the main Multum code for *psychotherapeutic agents*, its term for (some) psychotropics used in mental health treatment, was revised to exclude anxiolytics, sedatives, hypnotics, and CNS stimulants, leaving only antidepressants and antipsychotics. This explained a sudden and mysterious fall in overall psychotropic use in analyses at that stage. For this reason, we decided to abandon the use of the uppermost Multum classification code (TC1 code 242, *psychotherapeutic agents*) and solely rely on Multum Therapeutic Sub-Classes (e.g. TC1S1 code 251, *antipsychotics*) for our main analyses, which incurred no documented changes in grouping or composition during the study period. In future extensions of the current work for publication, we may abandon the MEPS's Multum classifications altogether and build groupings from the ground up using each prescription drug record's verified drug name (*RXDRGNAM*).

5.3 Characteristics of US minors aged 2-17, MEPS (Extended)

Here, we include sample characteristics for each study year that for reasons of brevity and formatting were not included in the main text: Tables 5.2, 5.3, 5.4, and 5.5.

5.4 Patterns of prescribed psychotropic prescription in US minors aged 2-17, MEPS (Extended)

Included here are annual estimates of overall and stratified use of prescribed psychotropics that for reasons of brevity and formatting were not included in the main text. Data for each year was divided into two tables: one table with estimates of overall use and use by drug class per 100 minors, and another with various sociodemographic variables stratified as a proportion of minors with any psychotropic use. Drugs-related tables are presented first (Tables 5.6, 5.7, 5.8, and 5.9). Sociodemographic-related tables were further subdivided into 2 tables for each year to fit into UCLA thesis parameters. The first 4 tables feature age, sex, and race / ethnicity variables (Tables 5.10, 5.11, 5.12, and 5.13), while the next 4 describe income, insurance type, and census region (Tables 5.14, 5.15, 5.16, and 5.17).

Table 5.2: Annual characteristics of US minors aged 2-17, MEPS 1996-2001

Characteristic	1996	1997	1998	1999	2000	2001
No. of minors, millions	67,656,845	67,983,171.68	68,596,526.67	68,750,618.84	68,538,962.85	68,772,520.20
Age, mean (SE)	9 (0.09)	8.99 (0.08)	9.06 (0.08)	8.99 (0.08)	8.99 (0.09)	9.09 (0.07)
Age category						
0 - 5	12,072,101	12,214,702.49	12,543,483.42	12,513,688.63	12,577,668.26	11,787,525.94
6 - 12	23,931,895	24,150,885.00	24,420,882.56	25,085,308.58	24,338,571.74	24,499,415.00
13 - 17	16,015,261	15,836,012.91	16,500,437.33	15,594,362.38	16,003,020.16	16,353,061.72
Sex						
Male	34,990,470	34,767,276.83	35,145,184.71	35,282,858.90	35,345,402.77	35,179,590.35
Female	32,666,375	33,215,894.85	33,451,341.96	33,467,759.94	33,193,560.08	33,592,929.84
Race / ethnicity						
American Indian	935,075	914,388.44	647,954.98	691,742.65	708,627.37	878,890.34
Aleut or Eskimo	88,488	52,436.86	23,949.53	23,890.36	52,513.48	34,508.07
Asian or Pacific Islander	2,498,756	2,428,938.38	2,904,002.35	2,922,996.94	2,515,751.42	3,140,676.00
Black	11,227,306	11,282,374.64	11,450,632.63	11,380,041.30	11,478,929.88	10,994,384.96
White	52,816,719	53,231,131.60	53,569,987.18	53,731,947.58	53,783,140.69	53,724,060.82
Hispanic						
Hispanic	9,866,745	10,441,336.80	10,792,372.88	11,015,553.98	11,223,732.14	12,204,772.84
Income (% of poverty line)						
$<$ 100%	13,930,543	13,506,955.24	13,299,367.75	11,827,630.58	11,177,862.09	11,329,667.67
100-124%	3,651,998	3,641,138.83	3,535,334.60	4,151,776.07	3,636,104.76	3,712,447.12
125-199%	11,418,492	10,894,404.67	10,510,023.12	11,238,275.29	10,345,976.92	11,289,995.25
200-399%	23,025,690	23,317,792.77	22,813,729.77	21,693,942.11	23,227,308.10	22,364,599.86
$\geq$ 400%	15,630,123	16,622,880.17	18,438,071.43	19,838,994.79	20,151,710.99	20,075,810.29
Health insurance type						
Any private insurance	46,958,449	47,295,871.60	47,581,905.61	49,903,189.68	48,092,260.54	47,009,373.33
Public insurance only	13,587,041	13,565,016.93	14,352,220.80	13,460,142.10	14,324,695.21	16,186,672.20
Uninsured	7,111,355	7,122,283.15	6,662,400.27	5,387,287.06	6,122,007.10	5,576,474.66
Census region						
Northeast	12,380,326	12,189,656.90	12,362,050.24	12,270,207.61	12,504,487.65	11,583,828.67
Midwest	16,100,381	16,140,067.01	16,728,376.41	16,686,355.30	16,181,528.27	14,846,577.29
South	23,296,771	23,413,745.14	23,042,689.57	23,100,064.22	23,044,673.96	25,349,263.19
West	15,879,367	16,239,702.63	16,463,410.45	16,693,991.70	16,808,272.97	16,992,851.04

Table 5.3: Annual characteristics of US minors aged 2-17, MEPS 2002-2008

Characteristic	2002	2003	2004	2005	2006	2007	2008
No. of minors, millions	69,301,716.70	69,228,297.75	69,318,561.58	69,316,205.95	69,924,688.81	69,591,538.35	69,704,676.92
Age, mean (SE)	9.09 (0.07)	9.17 (0.07)	9.19 (0.07)	9.18 (0.07)	9.15 (0.08)	9.12 (0.08)	9.06 (0.08)
Age category							
0 - 5	11,965,313.71	12,166,030.99	11,912,608.88	12,069,877.33	12,561,207.88	11,851,870.82	12,411,766.53
6 - 12	24,959,887.92	25,004,853.44	24,164,537.06	23,719,379.63	24,077,377.28	24,221,177.90	24,852,580.42
13 - 17	16,617,398.68	16,566,757.98	17,069,706.98	17,680,397.10	17,556,749.15	17,203,791.92	16,886,415.90
Sex							
Male	35,463,361.57	35,615,164.86	35,474,076.24	35,594,369.38	35,571,487.25	35,160,028.16	35,500,183.70
Female	33,838,355.13	33,613,132.89	33,844,485.34	33,721,836.58	34,353,201.56	34,431,510.18	34,204,493.21
Race / ethnicity							
White	53,408,224.02	53,738,600.63	53,445,743.69	52,981,190.09	53,368,448.61	53,213,867.06	53,213,617.49
Black	10,676,254.70	10,660,928.23	10,722,069.72	10,466,132.18	10,374,262.50	10,455,763.81	10,418,558.62
Am. Indian or AK Native	800,859.34	525,376.40	509,114.07	675,358.37	661,233.04	688,827.13	724,824.94
Asian	2,524,645.37	2,402,250.16	2,565,498.98	2,778,515.19	2,763,769.33	2,605,094.71	2,806,509.17
Native Hawaiian or PI	281,997.45	191,657.07	238,455.82	315,927.84	419,136.15	325,072.17	136,311.22
Multiple races reported	1,609,735.82	1,709,485.26	1,837,679.31	2,099,082.28	2,337,839.18	2,302,913.47	2,404,855.47
Hispanic							
Hispanic	12,670,894.40	13,047,401.11	13,544,488.10	13,746,008.30	14,203,574.47	14,601,594.80	15,239,985.25
Income (% of poverty line)							
$< 100\%$	11,734,359.58	11,911,652.70	12,627,252.45	12,528,287.79	12,213,445.09	12,765,622.82	13,158,818.88
100-124%	3,676,592.18	3,798,227.19	3,834,503.50	3,865,249.76	3,780,931.96	3,527,509.50	3,975,358.56
125-199%	11,147,044.20	11,186,538.78	10,954,755.48	10,682,417.06	11,170,639.31	10,593,566.18	10,912,069.16
200-399%	23,862,836.05	22,949,014.73	22,585,711.41	22,647,599.41	22,790,750.92	22,264,541.21	23,515,033.98
$\geq 400\%$	18,880,884.69	19,382,864.35	19,316,338.73	19,592,651.93	19,968,921.53	20,440,298.63	18,143,396.33
Health insurance type							
Any private insurance	45,931,142.04	45,440,770.10	44,551,672.44	44,368,667.03	44,465,183.80	42,417,412.56	42,815,378.26
Public insurance only	18,261,356.37	19,192,070.05	19,978,316.48	20,893,348.29	21,336,064.52	21,935,973.86	21,769,904.41
Uninsured	5,109,218.30	4,595,457.60	4,788,572.67	4,054,190.63	4,123,440.49	5,238,151.93	5,119,394.25
Census region							
Northeast	12,354,897.24	12,250,575.77	12,292,210.05	12,097,575.14	12,093,708.03	11,342,730.98	11,695,640.07
Midwest	15,447,681.79	15,185,370.65	15,053,008.27	15,240,559.72	15,376,314.85	15,398,101.80	14,751,237.76
South	24,668,207.06	25,120,381.93	25,413,761.46	25,103,469.10	25,501,604.52	25,781,983.36	26,438,113.57
West	16,830,930.61	16,671,969.40	16,559,581.80	16,874,601.99	16,953,061.41	17,068,722.20	16,819,685.51

Table 5.4: Annual characteristics of US minors aged 2-17, MEPS 2009-2015

Characteristic	2009	2010	2011	2012	2013	2014	2015
No. of minors, millions	70,443,903.20	70,658,139.28	70,081,896.48	69,943,807.04	70,243,469.28	69,880,490.19	70,191,765.55
Age, mean (SE)	8.93 (0.07)	8.92 (0.08)	9.06 (0.09)	9.09 (0.08)	9.14 (0.08)	9.11 (0.09)	9.13 (0.09)
Age category							
0 - 5	13,093,437.05	12,579,593.20	12,376,231.76	11,978,808.61	12,395,040.69	12,218,138.59	12,372,334.54
6 - 12	24,728,247.25	24,456,769.03	24,909,963.94	24,515,550.46	24,249,461.40	24,548,584.48	24,007,531.46
13 - 17	16,340,674.21	16,705,051.44	16,685,752.45	16,722,608.18	17,268,718.50	17,042,492.72	17,227,320.92
Sex							
Male	36,018,881.30	36,125,614.04	35,737,988.54	35,900,153.81	35,640,624.05	35,558,682.70	35,701,391.68
Female	34,425,021.91	34,532,525.24	34,343,907.95	34,043,653.23	34,602,845.24	34,321,807.49	34,490,373.87
Race / ethnicity							
White	53,349,245.70	53,754,951.25	53,925,812.96	53,298,603.12	52,121,340.80	50,795,553.46	50,477,206.77
Black	10,388,747.87	10,327,554.46	9,989,784.52	10,160,323.63	10,014,510.41	9,947,103.23	10,005,213.70
Am. Indian or AK Native	790,940.67	780,162.69	479,566.64	505,447.83	755,635.22	719,488.63	848,600.54
Asian	3,169,022.45	3,018,800.76	3,274,328.49	3,295,579.89	3,609,162.95	3,664,201.33	3,719,317.43
Native Hawaiian or PI	207,711.05	354,998.97	278,522.70	203,326.82	0.00	0.00	0.00
Multiple races reported	2,538,235.47	2,421,671.15	2,133,881.17	2,480,525.75	3,742,819.91	4,754,143.54	5,141,427.11
Hispanic							
Hispanic	15,954,105.21	16,311,885.51	16,611,570.64	16,661,027.29	16,823,475.60	17,134,587.07	17,281,257.89
Income (% of poverty line)							
$<$ 100%	14,464,491.11	15,627,491.39	15,177,144.90	15,403,241.03	14,283,105.76	14,893,875.48	13,878,499.84
100-124%	3,860,757.02	3,966,183.16	4,305,738.03	4,093,137.19	4,201,358.38	3,526,168.56	4,077,004.57
125-199%	11,296,678.81	10,871,074.15	11,371,221.26	11,008,203.91	11,548,552.87	11,322,850.17	11,259,557.57
200-399%	22,378,392.29	21,032,639.12	21,728,550.63	21,041,304.47	20,121,857.28	21,038,583.01	21,151,763.46
$\geq$ 400%	18,443,583.98	19,160,751.46	17,499,241.67	18,397,920.44	20,088,594.99	19,099,012.97	19,824,940.10
Health insurance type							
Any private insurance	43,144,247.74	41,549,171.05	41,161,054.47	40,503,808.60	40,417,123.82	39,972,424.90	40,585,171.66
Public insurance only	23,059,426.95	25,068,823.49	25,239,427.98	26,124,617.48	26,664,771.56	27,456,618.70	27,265,572.91
Uninsured	4,240,228.52	4,040,144.74	3,681,414.03	3,315,380.97	3,161,573.90	2,451,446.58	2,341,020.98
Census region							
Northeast	11,743,115.56	11,581,977.75	11,506,659.36	11,535,302.44	11,570,081.90	11,530,685.16	11,327,061.83
Midwest	15,170,814.26	15,068,950.51	14,979,101.33	14,823,890.31	14,939,402.65	14,568,616.58	15,130,577.03
South	26,538,056.51	26,836,487.55	26,481,199.52	26,301,626.52	26,829,408.53	26,708,526.15	26,746,974.23
West	16,991,916.88	17,170,723.47	17,114,936.27	17,282,987.77	16,904,576.19	17,072,662.31	16,987,152.45

Table 5.5: Annual characteristics of US minors aged 2-17, MEPS 2016-2018

Characteristic	2016	2017	2018
No. of minors, millions	70,204,037.28	69,798,223.74	69,884,307.17
Age, mean (SE)	9.15 (0.1)	9.13 (0.1)	9.14 (0.08)
Age category			
0 - 5	12,575,949.65	12,348,531.30	12,319,554.74
6 - 12	24,467,465.57	24,212,383.53	24,471,864.52
13 - 17	17,538,374.52	17,186,851.13	17,158,568.00
Sex			
Male	35,770,355.00	35,560,161.87	35,721,872.39
Female	34,433,682.28	34,238,061.86	34,162,434.77
Race / ethnicity			
White	50,059,371.63	49,922,068.00	50,452,278.13
Black	10,408,313.58	10,313,942.91	10,269,867.37
Am. Indian or AK Native	702,032.79	337,131.86	569,896.19
Asian	3,771,959.45	4,068,482.22	4,067,724.05
Native Hawaiian or PI	0.00	0.00	0.00
Multiple races reported	5,262,359.84	5,156,598.74	4,524,541.42
Hispanic			
Hispanic	17,434,167.34	17,811,379.34	18,034,011.00
Income (% of poverty line)			
$<$ 100%	13,036,161.41	12,223,691.65	11,315,855.67
100-124%	3,745,252.91	4,045,878.12	4,166,294.20
125-199%	11,066,268.23	11,020,898.91	10,984,392.27
200-399%	20,777,445.58	20,217,209.09	21,743,970.39
$\geq$ 400%	21,578,909.16	22,290,545.97	21,673,794.65
Health insurance type			
Any private insurance	40,714,995.00	41,972,846.05	42,885,729.02
Public insurance only	26,938,099.34	26,204,189.57	25,169,870.28
Uninsured	2,550,942.95	1,621,188.12	1,828,707.87
Census region			
Northeast	11,163,189.71	11,225,931.91	11,076,722.60
Midwest	14,850,740.79	14,772,547.03	14,586,844.34
South	27,386,597.70	26,815,808.80	27,261,806.08
West	16,803,509.09	16,983,936.00	16,958,934.13

Table 5.6: Variation in prescribed psychotropic use among US minors by overall and class-wise use, MEPS 1996-2001

Characteristic	1996	1997	1998	1999	2000	2001
Any psychotropic	3.5 (2.9, 4.1)	3.9 (3.4, 4.4)	3.9 (3.3, 4.5)	3.4 (2.9, 4)	3.7 (3.1, 4.2)	4.2 (3.6, 4.8)
Drug category						
CNS stimulants	2.349 (1.8547, 2.84)	2.51 (2.10, 2.93)	2.31 (1.836, 2.79)	2.131 (1.6956, 2.57)	1.914 (1.4756, 2.35)	2.29 (1.88, 2.71)
Antidepressants	0.880 (0.6339, 1.13)	1.25 (0.96, 1.54)	1.11 (0.792, 1.43)	0.975 (0.6821, 1.27)	1.634 (1.2612, 2.01)	1.64 (1.27, 2.02)
Mood stabilizers / anticonvulsants	0.584 (0.3169, 0.85)	0.49 (0.32, 0.66)	0.68 (0.459, 0.90)	0.552 (0.3185, 0.79)	0.460 (0.2571, 0.66)	0.58 (0.35, 0.82)
Antipsychotics	0.343 (0.1187, 0.57)	0.22 (0.13, 0.32)	0.22 (0.104, 0.33)	0.158 (0.0532, 0.26)	0.279 (0.1255, 0.43)	0.50 (0.33, 0.67)
Anxiolytics, sedatives, & hypnotics	0.092 (0.0095, 0.17)	0.11 (0.02, 0.19)	0.29 (0.085, 0.50)	0.081 (0.0024, 0.16)	0.051 (-0.0055, 0.11)	0.19 (0.08, 0.30)

Table 5.7: Variation in prescribed psychotropic use among US minors by overall and class-wise use, MEPS 2002-2007

Characteristic	2002	2003	2004	2005	2006	2007
Any psychotropic	4.3 (3.8, 4.8)	4.7 (4.1, 5.3)	4.4 (3.8, 5)	5.2 (4.6, 5.8)	5.6 (5, 6.3)	5.5 (4.8, 6.1)
Drug category						
CNS stimulants	2.00 (1.651, 2.35)	2.58 (2.089, 3.07)	2.79 (2.327, 3.25)	3.41 (2.89, 3.94)	3.60 (3.11, 4.09)	3.67 (3.13, 4.20)
Antidepressants	1.77 (1.468, 2.07)	2.03 (1.652, 2.40)	1.50 (1.173, 1.83)	1.46 (1.09, 1.82)	1.26 (1.00, 1.53)	1.00 (0.74, 1.26)
Mood stabilizers / anticonvulsants	0.80 (0.572, 1.03)	0.78 (0.533, 1.02)	0.69 (0.474, 0.90)	0.66 (0.47, 0.85)	0.70 (0.50, 0.91)	0.67 (0.43, 0.92)
Antipsychotics	0.52 (0.361, 0.67)	0.55 (0.365, 0.73)	0.66 (0.460, 0.87)	0.81 (0.59, 1.04)	0.69 (0.49, 0.88)	0.60 (0.41, 0.80)
Anxiolytics, sedatives, & hypnotics	0.16 (0.064, 0.26)	0.15 (0.043, 0.26)	0.16 (0.057, 0.26)	0.49 (0.31, 0.67)	0.64 (0.44, 0.83)	0.55 (0.30, 0.80)

Table 5.8: Variation in prescribed psychotropic use among US minors by overall and class-wise use, MEPS 2008-2013

Characteristic	2008	2009	2010	2011	2012	2013
Any psychotropic	5.8 (5.1, 6.5)	6.2 (5.4, 7)	6 (5.2, 6.7)	6.7 (5.9, 7.4)	7.3 (6.4, 8.1)	6.5 (5.7, 7.3)
Drug category						
CNS stimulants	4.03 (3.43, 4.63)	4.29 (3.61, 4.98)	4.33 (3.69, 4.98)	4.60 (4.00, 5.20)	4.66 (4.00, 5.33)	4.48 (3.75, 5.21)
Antidepressants	1.27 (0.91, 1.63)	1.51 (1.14, 1.87)	1.31 (0.96, 1.65)	1.71 (1.26, 2.15)	2.45 (1.94, 2.96)	1.87 (1.47, 2.28)
Mood stabilizers / anticonvulsants	0.68 (0.42, 0.94)	0.61 (0.38, 0.85)	0.59 (0.39, 0.79)	0.62 (0.39, 0.84)	0.61 (0.40, 0.81)	0.41 (0.20, 0.62)
Antipsychotics	1.02 (0.70, 1.34)	0.98 (0.67, 1.29)	0.78 (0.53, 1.02)	0.93 (0.64, 1.21)	0.81 (0.52, 1.09)	0.00 (0.00, 0.00)
Anxiolytics, sedatives, & hypnotics	0.37 (0.21, 0.53)	0.58 (0.39, 0.77)	0.42 (0.26, 0.59)	0.56 (0.37, 0.76)	0.54 (0.32, 0.76)	0.54 (0.36, 0.73)

Table 5.9: Variation in prescribed psychotropic use among US minors by overall and class-wise use, MEPS 2014-2018

Characteristic	2014	2015	2016	2017	2018
Any psychotropic	6.9 (6.1, 7.7)	6.4 (5.6, 7.2)	5.9 (5.1, 6.7)	7 (6.1, 7.9)	7.6 (6.7, 8.5)
Drug category					
CNS stimulants	4.93 (4.19, 5.67)	4.54 (3.86, 5.21)	4.28 (3.66, 4.90)	5.059 (4.287, 5.832)	5.262 (4.443, 6.080)
Antidepressants	2.05 (1.62, 2.49)	2.14 (1.58, 2.70)	1.55 (1.11, 1.99)	2.169 (1.659, 2.680)	2.734 (2.215, 3.253)
Mood stabilizers / anticonvulsants	0.53 (0.30, 0.75)	0.38 (0.21, 0.56)	0.24 (0.15, 0.33)	0.477 (0.283, 0.670)	0.634 (0.394, 0.873)
Antipsychotics	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.00 (0.00, 0.00)	0.032 (-0.021, 0.084)	0.012 (-0.012, 0.037)
Anxiolytics, sedatives, & hypnotics	0.61 (0.39, 0.82)	0.61 (0.37, 0.85)	0.66 (0.39, 0.92)	0.708 (0.463, 0.952)	0.718 (0.503, 0.933)

Table 5.10: Prescribed psychotropic use among US minors by age, sex, and race / ethnicity, MEPS 1996-2001

Characteristic	1996	1997	1998	1999	2000	2001
Age category						
0 - 5	3.1 (0.52, 5.7)	5.4 (2.77, 8.03)	8.4 (3.78, 13)	6.08 (2.66, 9.51)	1.74 (0.217, 3.26)	5.5 (3.26, 7.8)
6 - 12	56.6 (48.27, 64.8)	55.77 (49.33, 62.2)	52.41 (45.69, 59.1)	58.64 (50.75, 66.54)	43.3 (35.342, 51.26)	41 (35.4, 46.6)
13 - 17	28.2 (21.7, 34.8)	24.9 (19.14, 30.66)	27.67 (20.82, 34.5)	23.43 (17.04, 29.83)	40.64 (32.405, 48.88)	41.2 (35.46, 46.9)
Sex						
Male	73.8 (67.15, 80.4)	71.28 (65.16, 77.4)	71.04 (64.53, 77.5)	70.1 (62.18, 78.02)	64.43 (57.963, 70.9)	64.5 (58.26, 70.8)
Female	26.2 (19.55, 32.8)	28.72 (22.6, 34.84)	28.96 (22.46, 35.5)	29.9 (21.98, 37.82)	35.57 (29.1, 42.04)	35.5 (29.25, 41.7)
Race / ethnicity						
American Indian	0.9 (-0.13, 1.9)	1.2 (0.04, 2.36)	0.96 (-0.39, 2.3)	0.68 (-0.47, 1.82)	0.9 (-0.179, 1.97)	1.8 (0.15, 3.4)
Aleut or Eskimo	0 (0, 0)	0 (0, 0)	0 (0, 0)	0.22 (-0.21, 0.64)	0.12 (-0.111, 0.34)	0 (0, 0)
Asian or Pacific Islander	2.5 (-1.24, 6.2)	0.23 (-0.22, 0.67)	1.04 (-0.5, 2.6)	1.32 (-0.31, 2.95)	2.02 (0.023, 4.01)	2.1 (-0.59, 4.9)
Black	12.8 (6.87, 18.7)	7.06 (4.31, 9.82)	9.99 (5.53, 14.4)	8.06 (3.49, 12.62)	10.12 (5.594, 14.64)	10.5 (6.87, 14.2)
White	83.8 (77.16, 90.5)	91.51 (88.49, 94.53)	88.01 (83.22, 92.8)	89.73 (84.86, 94.59)	86.85 (82.189, 91.52)	85.5 (80.67, 90.4)
Hispanic						
Hispanic	7.6 (4.63, 10.6)	8.12 (5.63, 10.62)	10.14 (6.49, 13.8)	8.4 (5.4, 11.4)	8.06 (4.777, 11.34)	12.3 (8.33, 16.2)

Table 5.11: Prescribed psychotropic use among US minors by age, sex, and race / ethnicity, MEPS 2002-2007

Characteristic	2002	2003	2004	2005	2006	2007
Age category						
0 - 5	4.4 (1.75, 7.1)	2.578 (0.803, 4.35)	3.03 (0.99, 5.08)	5.29 (2.653, 7.9)	4.6 (2.141, 7.1)	6.06 (3.02, 9.1)
6 - 12	44.07 (37.78, 50.4)	44.224 (37.797, 50.65)	46.16 (39.13, 53.18)	49.34 (43.397, 55.3)	46.2 (40.058, 52.4)	46.66 (41.4, 51.9)
13 - 17	37.3 (31.66, 42.9)	38.327 (32.775, 43.88)	40.13 (33.6, 46.65)	33.48 (28.308, 38.7)	35.4 (29.891, 40.8)	36.6 (30.88, 42.3)
Sex						
Male	58.57 (53.3, 63.8)	60.124 (54.436, 65.81)	67.48 (61.65, 73.31)	66.33 (60.633, 72)	64.3 (58.211, 70.3)	61.85 (56.02, 67.7)
Female	41.43 (36.16, 46.7)	39.876 (34.187, 45.56)	32.52 (26.69, 38.35)	33.67 (27.964, 39.4)	35.7 (29.707, 41.8)	38.15 (32.31, 44)
Race / ethnicity						
White	84.78 (79.8, 89.8)	87.185 (83.051, 91.32)	84.66 (80.68, 88.64)	79.97 (75.596, 84.3)	81.6 (77.403, 85.8)	80.09 (75.28, 84.9)
Black	8.5 (5.47, 11.5)	8.66 (5.347, 11.97)	9.73 (6.61, 12.86)	11.94 (8.889, 15)	12.5 (9.286, 15.7)	14.11 (9.8, 18.4)
Am. Indian or AK Native	2.08 (0.48, 3.7)	1.379 (-0.019, 2.78)	0.28 (-0.11, 0.66)	1.45 (0.077, 2.8)	1.2 (0.097, 2.3)	0.39 (-0.23, 1)
Asian	0.64 (-0.13, 1.4)	0.366 (-0.145, 0.88)	1.12 (-0.28, 2.51)	1.04 (0.157, 1.9)	1 (-0.169, 2.2)	1.21 (0.15, 2.3)
Native Hawaiian or PI	0.93 (-0.89, 2.8)	0.099 (-0.095, 0.29)	1.06 (-0.13, 2.26)	0.92 (-0.081, 1.9)	0 (0, 0)	0.44 (-0.42, 1.3)
Multiple races reported	3.07 (-0.21, 6.3)	2.311 (0.812, 3.81)	3.15 (1.06, 5.24)	4.68 (1.943, 7.4)	3.7 (1.503, 5.9)	3.76 (1.96, 5.6)

Table 5.12: Prescribed psychotropic use among US minors by age, sex, and race / ethnicity, MEPS 2008-2013

Characteristic	2008	2009	2010	2011	2012	2013
Age category						
0 - 5	5.09 (3.39, 6.8)	4.37 (2.4, 6.3)	4.81 (2.79, 6.8)	3.3 (1.616, 4.9)	4.641 (2.499, 6.78)	4 (2.06, 5.9)
6 - 12	46.37 (40.31, 52.4)	54.42 (48.49, 60.4)	51.27 (45.98, 56.6)	44.4 (38.996, 49.9)	45.357 (40.29, 50.42)	43.7 (37.79, 49.6)
13 - 17	37.84 (31.88, 43.8)	32.75 (27.3, 38.2)	32.74 (27.49, 38)	40.5 (33.999, 46.9)	37.97 (32.931, 43.01)	38.5 (32.83, 44.2)
Sex						
Male	69.21 (63.84, 74.6)	69.16 (64.37, 73.9)	66.48 (60.7, 72.3)	66.7 (60.071, 73.4)	65.381 (59.742, 71.02)	64.5 (58.64, 70.3)
Female	30.79 (25.42, 36.2)	30.84 (26.05, 35.6)	33.52 (27.74, 39.3)	33.3 (26.605, 39.9)	34.619 (28.98, 40.26)	35.5 (29.65, 41.4)
Race / ethnicity						
White	81.13 (77.15, 85.1)	81.4 (77.72, 85.1)	79.1 (74.67, 83.5)	78.8 (74.193, 83.4)	78.338 (73.771, 82.9)	77 (72.44, 81.6)
Black	12.14 (9.19, 15.1)	12.16 (9.56, 14.8)	15.49 (11.9, 19.1)	14.2 (10.652, 17.7)	13.645 (10.111, 17.18)	14.6 (10.83, 18.3)
Am. Indian or AK Native	0.88 (-0.11, 1.9)	1.4 (-0.32, 3.1)	2.42 (0.22, 4.6)	2 (-0.078, 4)	0.727 (-0.164, 1.62)	1.8 (0.38, 3.2)
Asian	1.35 (0.53, 2.2)	1.12 (0.45, 1.8)	0.91 (0.11, 1.7)	2.5 (0.88, 4.2)	2.179 (0.679, 3.68)	1.6 (0.64, 2.5)
Native Hawaiian or PI	0.55 (-0.53, 1.6)	0.44 (-0.42, 1.3)	0 (0, 0)	0 (0, 0)	0.061 (-0.059, 0.18)	0 (0, 0)
Multiple races reported	3.96 (2.04, 5.9)	3.48 (1.76, 5.2)	2.08 (0.72, 3.4)	2.5 (0.901, 4.1)	5.05 (2.322, 7.78)	5 (2.52, 7.5)

Table 5.13: Prescribed psychotropic use among US minors by age, sex, and race / ethnicity, MEPS 2014-2018

Characteristic	2014	2015	2016	2017	2018
Age category					
0 - 5	5.3 (2.69, 7.8)	2.58 (1, 4.2)	3.35 (1.14, 5.6)	2.75 (0.678, 4.83)	3.3 (1.83, 4.8)
6 - 12	43 (37.09, 48.9)	46.12 (39.96, 52.3)	46.47 (40.3, 52.6)	45.63 (39.296, 51.96)	41.35 (36.6, 46.1)
13 - 17	41.6 (35.63, 47.6)	40.37 (34.8, 45.9)	40.92 (34.75, 47.1)	39.16 (33.043, 45.28)	41.92 (36.702, 47.1)
Sex					
Male	63.2 (57.19, 69.3)	55.93 (49.93, 61.9)	63.13 (57.45, 68.8)	63.64 (58.181, 69.09)	59.11 (54.276, 63.9)
Female	36.8 (30.72, 42.8)	44.07 (38.07, 50.1)	36.87 (31.2, 42.5)	36.36 (30.906, 41.82)	40.89 (36.065, 45.7)
Race / ethnicity					
White	73.8 (67.36, 80.3)	73.53 (67.05, 80)	75.78 (71.06, 80.5)	78.38 (73.555, 83.2)	78.97 (74.205, 83.7)
Black	14.5 (10.59, 18.4)	14.25 (9.84, 18.7)	13.56 (9.97, 17.1)	12.84 (9.052, 16.63)	12.71 (9.086, 16.3)
Am. Indian or AK Native	2.5 (-1.48, 6.5)	1.51 (-0.86, 3.9)	1.24 (-0.12, 2.6)	0.67 (-0.29, 1.63)	0.93 (0.082, 1.8)
Asian	1.7 (-0.41, 3.8)	0.59 (-0.46, 1.6)	0.67 (0.12, 1.2)	0.48 (-0.011, 0.97)	1.33 (0.171, 2.5)
Native Hawaiian or PI	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 0)
Multiple races reported	7.5 (4.43, 10.6)	10.11 (6.38, 13.8)	8.76 (5.47, 12)	7.63 (4.483, 10.78)	6.06 (3.397, 8.7)

Table 5.14: Prescribed psychotropic use among US minors by income, insurance type, and census region, MEPS 1996-2001

Characteristic	1996	1997	1998	1999	2000	2001
Income (% of poverty line)						
< 100%	17.2 (11.68, 22.7)	15.94 (11, 20.88)	16.28 (10.89, 21.7)	18.36 (11.51, 25.22)	10.41 (6.135, 14.68)	15.8 (10.75, 20.8)
100-124%	6.2 (2.52, 9.8)	4.81 (2.36, 7.25)	3.86 (1.12, 6.6)	7.14 (2.78, 11.5)	6.52 (2.569, 10.46)	5.9 (2.97, 8.8)
125-199%	15.1 (7.97, 22.2)	16.28 (11.08, 21.48)	19.44 (12.9, 26)	16.85 (9.99, 23.71)	16.59 (10.91, 22.26)	12.9 (8.63, 17.3)
200-399%	37.2 (28.53, 45.9)	35.33 (28.46, 42.2)	36.78 (29.8, 43.8)	26.81 (18.97, 34.66)	33.52 (25.579, 41.45)	36.6 (30.18, 42.9)
≥ 400%	24.3 (17.13, 31.5)	27.64 (21.63, 33.65)	23.63 (15.8, 31.5)	30.83 (23.18, 38.48)	32.97 (25.282, 40.66)	28.8 (22.43, 35.2)
Health insurance type						
Any private insurance	70.8 (63.53, 78)	73.8 (68.09, 79.5)	69.67 (62.4, 76.9)	69.08 (61.6, 76.56)	70.87 (63.676, 78.06)	67.4 (61.08, 73.7)
Public insurance only	25.5 (18.14, 32.9)	20.56 (15.34, 25.78)	23.91 (17.84, 30)	25.39 (18.45, 32.33)	25.7 (18.6, 32.8)	28.6 (22.48, 34.7)
Uninsured	3.7 (1.24, 6.2)	5.64 (2.62, 8.66)	6.42 (2.55, 10.3)	5.53 (2.17, 8.9)	3.43 (1.158, 5.71)	4 (1.78, 6.3)
Census region						
Northeast	16 (9.29, 22.6)	14.47 (10.07, 18.88)	15.43 (9.38, 21.5)	21.42 (14.53, 28.31)	20.93 (12.147, 29.71)	18.4 (12.26, 24.5)
Midwest	27.8 (18.67, 37)	24.56 (18.85, 30.26)	29.64 (21.89, 37.4)	26.94 (19.24, 34.64)	27.33 (20.869, 33.79)	24.4 (19.19, 29.5)
South	43.1 (33.85, 52.3)	40.66 (33.66, 47.66)	37.8 (30.34, 45.3)	38.06 (30.15, 45.96)	35.54 (27.163, 43.91)	41 (34.06, 48)
West	13.1 (7.52, 18.7)	20.31 (14.37, 26.25)	17.13 (12.39, 21.9)	13.58 (8.88, 18.28)	16.21 (11.428, 20.99)	16.3 (11.18, 21.3)

Table 5.15: Prescribed psychotropic use among US minors by income, insurance type, and census region, MEPS 2002-2007

Characteristic	2002	2003	2004	2005	2006	2007
Hispanic						
Hispanic	9.02 (6.05, 12)	12.268 (8.725, 15.81)	15.1 (10.45, 19.76)	13.59 (9.706, 17.5)	13.2 (9.674, 16.8)	11.67 (8.38, 15)
Income (% of poverty line)						
< 100%	14.74 (10.87, 18.6)	21.046 (16.701, 25.39)	16.83 (12.75, 20.9)	19.82 (15.315, 24.3)	20.2 (16.557, 23.9)	16.54 (12.36, 20.7)
100-124%	6.15 (3.46, 8.8)	3.284 (1.016, 5.55)	5.7 (3.02, 8.37)	7.75 (4.437, 11.1)	4.3 (2.416, 6.1)	5.13 (3.08, 7.2)
125-199%	14.55 (10.15, 19)	14.609 (10.748, 18.47)	15.23 (10.9, 19.57)	14.37 (10.614, 18.1)	16.2 (11.78, 20.7)	17.3 (12.21, 22.4)
200-399%	36.65 (30.1, 43.2)	36.679 (30.67, 42.69)	38.54 (32.03, 45.06)	34.35 (28.667, 40)	31.9 (26.935, 37)	30.12 (24.09, 36.2)
≥ 400%	27.91 (23.14, 32.7)	24.384 (19.156, 29.61)	23.7 (17.9, 29.49)	23.72 (18.502, 28.9)	27.3 (21.708, 33)	30.91 (24.89, 36.9)
Health insurance type						
Any private insurance	64.99 (58.99, 71)	66.698 (60.906, 72.49)	67.78 (62.06, 73.51)	61.52 (55.826, 67.2)	55.3 (49.749, 60.8)	64.36 (58.38, 70.4)
Public insurance only	32.06 (26.2, 37.9)	31.643 (25.852, 37.43)	30.38 (24.9, 35.87)	36.77 (31.14, 42.4)	39 (33.848, 44.1)	30.69 (25.12, 36.3)
Uninsured	2.95 (0.95, 4.9)	1.659 (0.857, 2.46)	1.83 (0.42, 3.25)	1.71 (0.113, 3.3)	5.8 (2.472, 9.1)	4.95 (1.68, 8.2)
Census region						
Northeast	19.35 (14.37, 24.3)	25.564 (19.093, 32.04)	21.73 (15.77, 27.69)	14.92 (9.899, 19.9)	15.9 (11.724, 20.1)	14.78 (10.39, 19.2)
Midwest	24.82 (19.09, 30.6)	22.612 (17.166, 28.06)	20.62 (14.68, 26.57)	22.46 (17.4, 27.5)	25.3 (19.403, 31.2)	24.69 (18.35, 31)
South	36.4 (30.4, 42.4)	33.817 (27.902, 39.73)	40.4 (33.06, 47.74)	45.8 (39.169, 52.4)	41.2 (34.987, 47.4)	39.91 (33.53, 46.3)
West	19.43 (15.24, 23.6)	18.007 (13.389, 22.62)	17.25 (11.9, 22.6)	16.82 (12.668, 21)	17.6 (12.611, 22.7)	20.62 (15.43, 25.8)

Table 5.16: Prescribed psychotropic use among US minors by income, insurance type, and census region, MEPS 2008-2013

Characteristic	2008	2009	2010	2011	2012	2013
Hispanic						
Hispanic	11.37 (8.15, 14.6)	10.97 (7.84, 14.1)	10.45 (7.46, 13.4)	12.2 (8.434, 15.9)	13.551 (9.923, 17.18)	12.2 (9.08, 15.4)
Income (% of poverty line)						
< 100%	19.03 (14.97, 23.1)	18.62 (14.53, 22.7)	19.9 (15.65, 24.2)	20 (15.36, 24.7)	21.761 (17.39, 26.13)	18.1 (13.91, 22.3)
100-124%	7.2 (3.6, 10.8)	5.26 (3.72, 6.8)	6.75 (3.78, 9.7)	4.7 (2.903, 6.6)	6.543 (3.573, 9.51)	5.9 (3.5, 8.4)
125-199%	11.36 (8.35, 14.4)	15.74 (11.21, 20.3)	14.63 (10.74, 18.5)	19.1 (14.343, 23.8)	15.019 (11.195, 18.84)	15 (10.94, 19)
200-399%	33.9 (27.27, 40.5)	32.68 (26.67, 38.7)	28.94 (23.53, 34.4)	26.8 (20.925, 32.8)	23.529 (18.331, 28.73)	30.3 (23.93, 36.7)
≥ 400%	28.52 (21.97, 35.1)	27.7 (21.49, 33.9)	29.78 (24.04, 35.5)	29.3 (23.676, 34.9)	33.149 (27.437, 38.86)	30.7 (23.67, 37.7)
Health insurance type						
Any private insurance	61.08 (55.16, 67)	60.91 (55.14, 66.7)	58.26 (52.46, 64.1)	57.8 (51.758, 63.9)	54.178 (47.888, 60.47)	55.5 (48.96, 62)
Public insurance only	36.11 (30.84, 41.4)	37.92 (32.39, 43.5)	39.4 (33.7, 45.1)	40.3 (34.29, 46.3)	43.602 (37.439, 49.76)	41.7 (35.41, 48.1)
Uninsured	2.81 (0.65, 5)	1.17 (0.21, 2.1)	2.34 (0.63, 4.1)	1.9 (0.361, 3.4)	2.221 (0.698, 3.74)	2.8 (0.49, 5.1)
Census region						
Northeast	19.53 (13.68, 25.4)	14.1 (9.3, 18.9)	15.04 (9.38, 20.7)	14.9 (9.466, 20.2)	18.757 (12.074, 25.44)	21.7 (15.52, 27.9)
Midwest	23.25 (17.54, 29)	26.06 (19.89, 32.2)	25.42 (19.23, 31.6)	27.2 (20.874, 33.4)	27.073 (21.556, 32.59)	23.8 (17.78, 29.8)
South	44.04 (36.91, 51.2)	49.23 (42.23, 56.2)	44.02 (36.76, 51.3)	41.5 (35.019, 48)	38.76 (31.975, 45.55)	39.2 (31.7, 46.7)
West	13.18 (9.14, 17.2)	10.61 (7.51, 13.7)	15.52 (11.23, 19.8)	16.5 (12.125, 20.9)	15.41 (11.031, 19.79)	15.3 (10.06, 20.5)

Table 5.17: Prescribed psychotropic use among US minors by income, insurance type, and census region, MEPS 2014-2018

Characteristic	2014	2015	2016	2017	2018
Hispanic					
Hispanic	11.8 (8.51, 15.2)	14.51 (11.27, 17.8)	16.59 (12.95, 20.2)	13.13 (9.644, 16.62)	15.38 (11.147, 19.6)
Income (% of poverty line)					
< 100%	19.3 (15.31, 23.3)	21.02 (15.93, 26.1)	19.26 (15.05, 23.5)	20.31 (15.437, 25.19)	18.28 (13.988, 22.6)
100-124%	7.7 (3.94, 11.4)	5.86 (3.32, 8.4)	6.04 (2.77, 9.3)	6.53 (3.481, 9.58)	5.79 (2.172, 9.4)
125-199%	15.6 (11.76, 19.5)	16.37 (11.93, 20.8)	16.8 (12.14, 21.5)	14.18 (9.79, 18.57)	14.09 (10.44, 17.7)
200-399%	26.2 (20.73, 31.7)	28.95 (23.5, 34.4)	29.49 (23.22, 35.8)	28.13 (22.146, 34.12)	25.99 (20.973, 31)
≥ 400%	31.2 (24.03, 38.4)	27.8 (21.56, 34)	28.41 (22.45, 34.4)	30.85 (24.739, 36.95)	35.85 (29.234, 42.5)
Health insurance type					
Any private insurance	54.6 (48.56, 60.5)	53.17 (47.03, 59.3)	51.57 (44.63, 58.5)	59.46 (53.124, 65.8)	63.61 (57.825, 69.4)
Public insurance only	42.4 (36.16, 48.6)	45.24 (39.1, 51.4)	46.51 (39.77, 53.2)	40.54 (34.205, 46.88)	35.29 (29.552, 41)
Uninsured	3.1 (1.04, 5.1)	1.59 (0.69, 2.5)	1.92 (0.47, 3.4)	0 (0, 0)	1.09 (0.042, 2.1)
Census region					
Northeast	19.6 (14.1, 25.2)	17.34 (11.17, 23.5)	13.33 (8.82, 17.8)	16.91 (10.651, 23.17)	17.71 (13.007, 22.4)
Midwest	21.3 (16.01, 26.5)	27.14 (20.46, 33.8)	27.06 (20.45, 33.7)	27.66 (21.283, 34.04)	27.16 (21.358, 33)
South	43.3 (36.46, 50.2)	39.27 (32.31, 46.2)	45.43 (37.95, 52.9)	40.93 (34.376, 47.48)	35.93 (29.666, 42.2)
West	15.8 (11.51, 20)	16.24 (11.11, 21.4)	14.18 (7.97, 20.4)	14.5 (10.251, 18.75)	19.2 (12.814, 25.6)

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