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Effects of State Autism Mandate Age Caps on Health Service Use and Spending Among Adolescents

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Abstract

Objective—Many states with mandates requiring commercial insurers to cover autism spectrum disorder (ASD) health services specify upper age limits above which coverage is no longer mandated. It is unknown what effects these age caps have on health service use and spending among adolescents who have exceeded the age cap.

Method—Using administrative claims data from three national commercial insurers, a difference-in-differences approach was used to estimate effects of age caps on health service use and spending among adolescents with ASD. Statistical models compared changes in use and spending between those above versus below the age cap among those eligible versus ineligible for mandated coverage. The analytic sample included data from 2008 through 2012 on 7,845 individuals (151,976 person-months) ages 10–21 years in 11 states imposing mandate age caps going into effect during adolescence.

Results—Age caps were associated with 4.2 percentage point (95% CI: –7.0, –1.5) lower probability of any ASD-specific service use in a month and \$69 less (95% CI: –112, –\$26) in average monthly spending on ASD-specific services than would have been expected given concomitant pre-post age cap differences among individuals in the same states who were never eligible for mandate-covered services. In addition, age caps were associated with \$99 (95% CI: –\$168, –\$30) lower average monthly spending on all health care services.

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Conclusion—Insurance mandates that include age caps going into effect during adolescence reduce health service use and spending among individuals with ASD during a critical phase of the life course.

Keywords

autism spectrum disorder; insurance coverage; state insurance law

INTRODUCTION

Over the last two decades, 46 states and the District of Columbia have passed laws requiring insurers to include health services for autism spectrum disorder (ASD) in their covered benefits.¹ ASD is a developmental disorder characterized by social interaction and communication impairments, repetitive behaviors, and circumscribed interests.² The prevalence of ASD has risen over time, with the most recent studies estimating that ASD affects one in 68 children.³

Treatments for ASD include behavioral therapies, such as behavioral modification and social skills training, as well as functional therapies, such as speech/language, occupational, and physical therapy.⁴ Other important services include mental health care, respite care, caregiver training and therapy, case management, and vocational training and support.^{4–6} Behavioral therapies can be particularly time-intensive, involving 25–40 hours of services per week for several years.⁴ Given the intensity of recommended services and the high burden of medical and psychiatric comorbidities among this population, health care use and costs are substantially greater among children with ASD than among other children.^{7,8} Among commercially insured children, Croen et al. estimated that age- and gender-adjusted costs were more than threefold higher for children with ASD relative to children without ASD.⁷

Individuals with ASD face significant challenges accessing services. Caretakers of children with ASD are more likely to report unmet health care needs relative to caretakers of children with other disabilities.⁹ Primary contributors to unmet care needs include cost, insurance plan gaps, inadequate school-based resources, and limited provider availability.⁹ Given the financial barriers to treatment access, advocates have pushed for mandated insurance coverage of ASD treatments, which has resulted in the enactment of state autism insurance mandates.¹ These laws require insurers to cover many ASD-related health services,¹ such as diagnostic and assessment services, behavioral and functional therapies, mental health care, and medication management. However, self-insured plans offered by large employers are exempt from state insurance regulation under the Employee Retirement Income Security Act (ERISA). Therefore, state insurance mandates apply only to the 40–60 percent of individuals in fully-insured plans in which an insurance company, rather than the employer, assumes the financial risk associated with coverage.¹⁰

According to data compiled by the consumer advocacy organization Autism Speaks,¹ by the end of 2012 (the end of our study period), 29 state autism mandates included restrictions on the ages to which coverage applies (Table 1). Eleven of these states specified mandate age caps that only require insurers to cover ASD services up to a certain point during

adolescence. However, ASD is a lifelong condition requiring ongoing management of its core deficits^{6,11} and commonly co-occurring medical and psychiatric conditions into adulthood.¹² Although some symptoms may improve by adulthood, most impairments, such as those related to social interaction and communication, typically endure.^{11,13,14} Furthermore, individuals with ASD face challenges in adulthood maintaining employment and living independently.^{15–17} As individuals with ASD age, their use of behavioral and psychosocial therapies, which have been shown to address ASD-related challenges, declines.^{18–20} This change in service use likely reflects not only evolving treatment needs but also increased difficulty accessing specialty providers^{19,20} and a limited evidence base for adult treatment.^{4,6} Further disruption in health care use for adolescents and young adults occurs upon the loss of school-based services after leaving high school.²¹

Emerging research on the effects of state mandates suggest that these laws have led to increases in diagnosed prevalence of ASD as well as use of and spending on health care services among children with ASD.^{22,23} Using commercial insurance claims data, Mandell et al. estimated a ten percent increase in the prevalence of diagnosed ASD attributable to state mandates in the first year following their implementation, with larger increases in subsequent years.²² Barry et al. found that mandate implementation was associated with a 3.4 percentage point increase in the probability of using ASD-related services and a \$77 increase in average monthly spending among children with ASD.²³ Although a study by Chatterji et al. found no impact of the mandates on access to care and financial burden,²⁴ this study used survey data that did not allow for the identification of children enrolled in insurance plans subject to state mandates, limiting the inferences one can draw from their findings.

No research to date has examined the impact of state mandate age caps, which determine the breadth of the ASD population to which these mandates apply. While this prior research suggests that the mandates have a positive impact on use of health services among children with ASD, the mandates' effects may differ over the life course depending on the mandate's age cap. Insurers may stop covering ASD-related services once individuals exceed the age cap, resulting in disruptions in outpatient therapies and possible increases in hospitalizations and greater reliance on psychotropic medications to control symptoms that worsen in the absence of outpatient therapies. Alternatively, health plans may continue coverage when individuals with ASD age out of the mandates if they find that use of effective outpatient ASD services reduces costs associated with more expensive categories of health care (e.g., inpatient care).⁵ The aim of the present study was to estimate how state autism insurance mandate age caps affect health service use and spending among adolescents with ASD.

METHOD

Data

We used inpatient, outpatient, and pharmacy claims data from three national, commercial insurers: Aetna, Humana, and United Healthcare. The data, available through the Health Care Cost Institute (HCCI),²⁵ provide information on more than 50 million individuals per year across all states and the District of Columbia. We identified individuals 10 through 21 years old during the study period with at least two claims with an ASD diagnosis

(*International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM]* code 299.xx) occurring on unique dates at any point during the study period January 1, 2008 through December 31, 2012. This strategy has high positive predictive value in identifying individuals with ASD.²⁶

The unit of analysis was the person calendar-month. Analyses included only person-months for individuals enrolled in fully insured (in which the insurer assumes the financial risk of coverage) or self-insured (in which the employer assumes the financial risk of coverage) plans in states that had implemented a mandate with an age cap that went into effect during adolescence (age caps at 14–18 years inclusive). We only include person-months occurring during the calendar period after which the state mandate is in effect because we are evaluating the impact of mandate age caps and not the impact of the implementation of the mandate. Details of state mandates, including the date of implementation, were extracted from information collected by Autism Speaks¹ and verified by the study team through review of each state's statute. Enrollees with behavioral health coverage managed by a carve-out plan were excluded because their claims were not represented comprehensively in these data. Among the 29 states with mandates implemented during the study period, we excluded states with no age caps (n=5) and those with age caps during early childhood (<10 years, n=4) given our focus on adolescence, a key transitional period. Given the limited supply of providers serving adults with ASD^{27,28} and the likely differences between commercially insured young adults with ASD (who may or may not be dependents on their caretakers' plans) and commercially insured adolescents with ASD (who are dependents on their caretakers' plans), we also excluded states with age caps during young adulthood (20–22 years, n=9). The final analytic sample included 7,845 unique individuals and 151,976 person-months in 11 states with mandate age caps at ages 14 (Connecticut, Rhode Island), 15 (South Carolina), 16 (Arizona), 17 (Arkansas, Louisiana), and 18 (Colorado, Michigan, Missouri, Montana, West Virginia) (see Table 1). This study was determined to be exempt by the Johns Hopkins Bloomberg School of Public Health and University of Pennsylvania institutional review boards.

Measures

Outcomes included measures of the probability of use and average monthly spending on ASD-related services and overall health services among individuals with ASD. ASD-related service measures included: all inpatient and outpatient claims with an ASD diagnosis (299.xx) and psychotropic medication claims; only inpatient claims with an ASD diagnosis; and only outpatient claims with an ASD diagnosis.^{18,22,23} Overall health care services included: all inpatient (with and without an ASD diagnosis), outpatient, and medication claims; only inpatient claims; only outpatient claims; and psychotropic medication claims.²³ Binary indicators were created for each service category based on whether the person used at least one claim for that service in that month. We calculated monthly spending for each service category as the sum of both the insurer-covered and out-of-pocket (i.e., enrollee-covered cost sharing and deductibles) expenses. We adjusted spending measures to 2012 US dollars using the CMS Office of the Actuary's Personal Health Care Index.²⁹

Primary independent variables included indicators for whether the child was subject to the mandate or not in a given month and indicators for whether the age during the person-month exceeded or fell below the state mandate's age cap. Enrollment in a fully insured plan prior to aging beyond the mandate's age cap denoted exposure to mandated coverage. Our comparison group included enrollees in self-insured plans, which were not subject to state mandates or age caps. Person age at the start of each calendar month was based on the person's birth year and assumed a mid-year birth date of July 1st because a fully specified date of birth was not available in the dataset. In a sensitivity analysis, we assumed a birth date of December 31st; results did not change qualitatively (Table S1, available online). Covariates included indicators for enrollee sex, insurance product type (i.e., health maintenance organization, point of service, preferred provider organization, exclusive provider organization, indemnity or other), pharmacy coverage, and enrollment in a consumer-directed health plan. Age, year, and state fixed effects were also included in the model specification. For the psychotropic medication use and spending outcomes, analyses were restricted to individuals with pharmacy coverage (n=82,200 person-months [54%], 4,458 individuals [57%]).

Analytic Approach

Descriptive statistics were calculated using data from the first month each person appeared in the dataset. We compared characteristics among those in fully insured versus self-insured plans. Difference-in-differences models were used to compare the differences in outcomes below and above the age cap among those who were eligible for mandated coverage (enrolled in fully insured plans) to the differences in outcomes below and above the age cap among those who were never eligible for mandated coverage (enrolled in self-insured plans). The effect estimate was measured as the difference in these two differences. This analytic design allowed us to account for age trends in the outcomes that were not associated with the age cap (Supplement 1, including Table S2 and Figure S1, available online). Unadjusted and adjusted models (with covariates and fixed effects) were estimated for each outcome.

To estimate probability of any use for each service category, we used logistic regression models. Given the large proportions of person-months with zero use, we implemented two-part models to estimate unconditional spending for each service category.³⁰ In the two-part models, the first part was a logistic regression model predicting any use of the service in that person-month. The second part was a generalized linear model of average monthly spending (conditional on any spending) using a log link and the best-fitting family distribution, which differed by outcome and was selected from modified Park tests.³¹ The unconditional spending estimates produced by the two-part models multiply results from the first and second part of the models to produce estimates of spending among the whole sample, rather than being restricted to those with any spending. We translated the coefficient estimates from the models into marginal effects on the measures' original scales (probability of use and dollars of mean spending) to facilitate interpretation of results. Standard errors were adjusted using nonparametric block bootstrapping to account for clustering within states.³²

During our study period, several states implemented mandates with no age caps, providing an opportunity to test a falsification hypothesis.³³ Finding effects of placebo mandate age

caps on outcomes in states without age caps would suggest a spurious association between real mandate age caps and outcomes. The falsification analysis included California, Indiana, Massachusetts, and Indiana (N=156,246 person-months). We estimated models that were identical to our main analysis (comparing pre-post age cap differences among fully insured and self-insured enrollees), separately testing the effects of age caps at 14, 15, 16, 17, and 18 years on average monthly spending on all ASD-related health services. We found no significant association between these hypothetical age caps and the outcome (Table S3, available online).

RESULTS

Among the sample, 26% (n=2,048) were subject to mandated coverage of autism services prior to reaching the age cap; the remaining 74% (n=5,797) were enrolled in self-insured plans that were never subject to mandate provisions (Table 2). Over 80% were male, and the mean age was 13 years during the first month each person entered the dataset. The largest proportions of enrollees in both groups (fully and self-insured) were in point of service (POS) plans. A minority of study participants (16%) had consumer-directed health plans.

Table 3 displays the estimated effects of the age cap on use and spending among individuals with ASD. Among fully insured enrollees with ASD subject to the age caps, the adjusted probability of using any ASD-related service in a month was 26.8% among individuals at ages preceding the age cap and dropped to 23.9% at ages exceeding the age cap, while average adjusted monthly spending was \$155 among those below the age cap and \$120 among those above. Among those not subject to the autism mandate in their state due to enrollment in a self-insured health plan, the adjusted probability of any ASD service use was 21.6% among those pre-age cap and increased to 22.9% among those post-age cap; average adjusted monthly spending rose from \$121 to \$156 pre-post age cap. Adjusted difference-in-differences estimates indicate that mandate caps were associated with a 4.2 percentage point lower (95% CI: -7.0, -1.5) monthly probability of using any ASD service and \$69 less (95% CI: -\$112, -\$26) in average monthly spending on all ASD-specific services relative to expected differences pre-post age cap given changes in the comparison group.

We found similar patterns in use and average monthly spending on ASD-related outpatient health care services associated with the age cap. The age cap was associated with a 4.1 percentage point lower (95% CI: -6.9, -1.4) probability of use of ASD-related outpatient services and \$60 less (95% CI: -\$112, -\$8) in average monthly spending on this category of services. For ASD-related inpatient services, the age cap was associated with a 0.2 percentage point lower (95% CI: -0.4, -0.0) probability of use, but this outcome was not significant in the sensitivity analysis (Table S1, available online).

The age cap was not associated with a significant difference in the probability of any health care use, but it was associated with lower average monthly spending on overall health care services (-\$99, 95% CI: -\$168, \$-30) and all outpatient health services (-\$110, 95% CI: -\$181, - \$38).

No significant differences were observed in probability of use or average monthly spending related to all inpatient services or psychotropic medications.

DISCUSSION

State autism mandate age caps were associated with significantly lower levels of use of and spending on ASD-related services, particularly outpatient ASD services, than would have been expected given differences pre-post the age cap among individuals in the same states who were never eligible for mandate-covered services. In addition, age caps were associated with significantly lower levels of total health care spending, again driven largely by declines in spending on outpatient services. These findings suggest that mandate age caps may result in a substantial reversal of estimated gains made among eligible children in states with insurance mandates. For instance, Barry et al. found that the implementation of state mandates was associated with increases in average monthly spending of \$77 on all ASD-related services and \$72 on ASD-related outpatient services.²³ Meanwhile, our study estimated that the age caps were associated with declines in average monthly spending of \$69 on all ASD-related services and \$60 on ASD-related outpatient services, although it is important to note that our analysis focused on a subset of the states included in the Barry study. The estimated change attributable to age caps translates to an annual reduction in spending of \$828 on all ASD-related services from a baseline of \$1,860 in annual spending among the mandate-eligible children at ages below the age cap.

A secondary hypothesis was that the mandate age caps might drive an increase in use of and spending on inpatient services or psychotropic medication due to worsening of symptoms as a result of discontinued or reduced use of treatments post-age cap. We did not find evidence supporting this hypothesis. Rather, results indicate a marginally significant increase in use of ASD-related inpatient services attributable to the caps and no significant change in use of or spending on psychotropic medications. Nevertheless, given other research showing a relationship between use of outpatient and inpatient services among individuals with ASD⁵ and our findings of reduced outpatient service use and spending attributable to the caps, future research should explore this question.

States' rationale for selecting particular ages at which to cap coverage requirements is unclear. Given the variable nature of coverage caps across states, it is unlikely that states identified these age caps based on any established medical criteria. By reducing the intensity of health care use, age caps during adolescence may exacerbate the difficulties of this phase of the life course.^{19,21} First, mandate age caps may complicate the already challenging process of preparing for and entering adulthood.³⁴ Young adults with ASD are less likely than young adults with other disabilities to be employed, even after adjusting for a host of other factors.¹⁶ Most adults with ASD also do not live fully independently and continue to rely on families.¹⁹ Yet adolescents with ASD are only half as likely as those with other special health care needs to receive transition planning and support services, which may improve employment and independent living prospects.³⁵ Insufficient transition planning services during this period also may impede eligibility determination processes and enrollment in adult benefit programs.³⁶ Age cap-induced disruptions in coverage of ASD treatments may hinder continuity in delivery of services, such as social skills training and

occupational therapy, that can support adjustment to the next life stage.¹⁹ Psychiatrists and other health professionals unfamiliar with age caps may be inhibited in serving their patients with ASD. Understanding when benefits end may help these providers develop more realistic treatment plans and help patients identify and connect with alternative sources of support.

Second, age caps may worsen disparities in provider supply between younger and older individuals with ASD.²¹ Qualitative research suggests that the implementation of state autism mandates may have spurred growth in the ASD provider workforce because mandates enable such providers to be reimbursed by private insurers.³⁷ Age caps, in contrast, may stunt any potential growth in providers that serve older adolescents and adults with ASD because these caps limit providers serving this older population from obtaining reimbursement from private insurers. Third, many individuals with ASD have co-occurring psychiatric disorders, which often emerge in adolescence.³⁸ Discontinuing insurance coverage of ASD services in response to age caps theoretically could impede detection and treatment of emerging psychiatric disorders, although we did not find changes in psychotropic medication spending attributable to the mandate age caps and did not examine non-ASD mental health spending; future research should explore these questions. The age caps that most states have included in their autism insurance mandates ignore the many unmet needs and challenges that individuals with ASD face as they grow older. Given that individuals with ASD accrue the majority of their health and social costs during adulthood,³⁹ age caps may represent a missed opportunity for mandates to improve continuity of care and enhance health and social functioning for individuals with ASD across the age distribution.

This study has several limitations. First, we could not identify the person's age with precision and assumed the same birth date, July 1st, for all enrollees in the sample. Second, claims data do not capture services paid for completely out of pocket by families or delivered through the school system. Future research should assess whether age caps place greater financial burdens on families of individuals with ASD by increasing the portion of health services that the families cover out-of-pocket. Third, it is unclear if insurers' discontinuation of coverage in response to state mandates' age caps would go into effect immediately following a child's birth date placing him/her above the state's age cap or only at the time of the plan renewal, typically in January of the following year. However, a sensitivity analysis varying the birth date to December 31st generated results similar to our main analysis. This sensitivity analysis served a dual purpose, allowing us to test the study hypotheses under a different age assumption as well as under a different assumption about the timing of insurers' response to the age cap. Fourth, while insurance claims provide rich detail on patterns of service use, these data are limited in their provision of sociodemographic and clinical details, such as ASD severity or co-occurring disabilities, on the study sample. Finally, this study does not examine the extent to which mandated age caps affect health and functional outcomes, medically necessary services, and financial burden on families of adolescents with ASD; future research should examine the extent to which age caps affect these outcomes.

Age caps are associated with reduced use and spending on ASD-related health care services and reduced spending on overall health care services among adolescents who have exceeded mandated age caps. Insurers do not appear to be extending coverage of ASD-related health services beyond the period required by state laws. Given that many mandated age caps occur during adolescence, this policy feature may worsen the interruptions in health services that individuals with ASD already experience as they age.

Lay Summary

Many states with mandates requiring commercial insurers to cover autism spectrum disorder (ASD) health services specify upper age limits above which coverage is no longer mandated. In this study, we evaluated the impact of these mandate age caps on health service use and spending among adolescents. Findings indicate reduced health service use and spending during a critical phase of the life course.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Clinical Guidance

- What was the clinical question behind the study?
This study investigated how health service use and spending of commercially insured adolescents with autism spectrum disorder (ASD) is affected by the age caps included in many state autism insurance mandates.
- Findings from this study suggest that adolescents living in states with autism mandates that include age caps may experience declines in use of ASD-specific health services when aging beyond the period of eligibility for mandate-covered services.
- Even in states with autism insurance mandates, clinicians must consider how mandate age caps may affect the adolescents they serve. Anticipating potential disruptions in insurance coverage of important health services for youth with ASD may help clinicians to develop more feasible treatment plans and assist their patients in identifying and connecting with alternative sources of support.

Table 1

Age Caps Among States With Autism Insurance Mandates Implemented Through 2012

State	Implementation Date	Age Cap ^a	Services Covered	Monetary Limit
States Included in Analysis				
Arizona	6/30/2009	16	DA, BH	<9 years – \$50,000/year 9 years – \$25,000/year ^f
Arkansas	10/1/2011	17	DA, BH, FT, MM	\$50,000/year
Colorado	7/1/2010	18	DA, BH, FT, MM	<9 years – \$34,000/year 9 years – \$12,000/year ^f
Connecticut	1/1/2010	14	DA, BH, FT, MM	<9 years – \$50,000/year 9–12 years – \$35,000/year 13 years – \$25,000/year
Louisiana	1/1/2009	17	BH, FT, MM	\$144,000 (lifetime)
Michigan	10/15/2012	18	DA, BH, FT, MM	<6 years – \$50,000/year 7–12 years – \$40,000/year 13 years – \$30,000/year
Missouri	1/1/2011	18	DA, BH, FT, MM	\$40,000/year
Montana	1/1/2010	18	DA, BH, FT, MM	<9 years – \$50,000/year 9 years – \$20,000/year
Rhode Island	1/1/2012	14	BH, FT	\$32,000/year
South Carolina	7/1/2008	15	DA, BH, FT, MM	\$50,000/year
West Virginia	1/1/2012	18	BH	\$30,000/year for 3 years
States Excluded From Analysis				
California ^b	7/1/2012	No Age Cap	BH	Not specified
Delaware	12/11/2012	20	DA, BH, FT, MM	\$36,000
Florida	4/1/2009	21 ^c	DA, BH, FT	\$36,000 (annually) \$200,000 (lifetime)
Illinois	12/12/2008	20	DA, BH, FT, MM	\$36,000
Indiana ^b	7/1/2001	No Age Cap	BH, FT, MM	No cap
Kentucky	1/1/2011	21	DA, BH, FT, MM	\$50,000 (for large group plans) \$1,000/month (for small group plans)
Maine	1/1/2011	5	DA, BH, FT, MM	\$36,000 ^f
Massachusetts ^b	1/1/2011	No Age Cap	DA, BH, FT, MM	No cap
Nevada	1/1/2011	21 ^d	DA, BH, FT, MM	\$36,000 ^f
New Hampshire	1/1/2011	21	DA, BH, FT, MM	<13 years – \$36,000 13 years – \$27,000
New Jersey ^b	2/8/2010	No Age Cap	DA, BH, FT	\$36,000
New Mexico	6/19/2009	22 ^e	DA, BH, FT	\$36,000 (annually) \$200,000 (lifetime)
New York	11/1/2012	No Age Cap	DA, BH, FT, MM	\$45,000 ^f
Pennsylvania	7/1/2009	20	DA, BH, FT, MM	\$36,000

State	Implementation Date	Age Cap ^a	Services Covered	Monetary Limit
Texas	1/1/2008 1/1/2010	2–5 9	DA, BH, FT, MM	Not specified
Vermont	10/1/2011 10/1/2012	1.5–6 21	DA, BH, FT, MM	Not specified
Virginia	1/1/2012	2–6	DA, BH, FT, MM	\$35,000
Wisconsin	11/1/2009	2–9	BH	\$50,000 for at least 4 years; minimum \$25,000 after ^f

Note: BH = behavioral therapy; DA = diagnosis and assessment; FT = functional therapy; MM = medication management.

^aState has no lower bound of age eligibility unless otherwise specified.

^bStates included in falsification test.

^cIndividuals > 17 years old remain eligible while they are still in high school.

^dIndividuals > 18 years old remain eligible while they are still in high school through age 21.

^eIndividuals > 19 years old remain eligible while they are still in high school through age 22.

^fMonetary limit is for behavioral therapy.

Table 2

Descriptive Characteristics of Study Sample, 2008–2012

	Total Number of Individuals Represented in Analytic Sample	Fully Insured ^a	Self-Insured ^b
	N=7,845	n=2,048	n=5,797
Male, % (N)	81.3 (6,380)	82.1 (1,682)	81.0 (4,698)
Mean Age	13.3	13.4	13.3
Age Group, % (N)			
10–14 years	66.4 (5,205)	66.7 (1,365)	66.2 (3,840)
15–18 years	24.3 (1,908)	24.3 (498)	24.3 (1,410)
19–21 years	9.3 (732)	9.0 (185)	9.4 (547)
Product, % (N)			
Health Maintenance Organization	5.7 (445)	19.1 (391)	0.9 (54)
Point of Service	73.1 (5,732)	66.5 (1,361)	75.4 (4,371)
Preferred Provider Organization	10.4 (814)	12.9 (264)	9.5 (550)
Other (e.g., indemnity, exclusive provider organization, etc.)	14.2 (822)	1.6 (32)	10.9 (854)
Consumer Directed Health Plan, % (N)	16.2 (1,270)	16.0 (328)	16.3 (942)

Notes: Information displayed on each individual in the study sample is based on their characteristics in the first month they entered the dataset. The total number of person-months included in the study sample was 151,976.

^aIndividuals on fully insured plans were covered by state laws mandating that insurance companies cover Autism Spectrum Disorder (ASD) services.

^bIndividuals on self-insured plans were not covered by state laws mandating that insurance companies cover ASD services.

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Table 3 Adjusted Estimates of Person-Month Level Effects of State Autism Insurance Mandate Age Cap, 2008–2012

Outcomes	Probability of Use (%)		Average Monthly Spending		Change in Value Attributable to Age Cap Probability of Use DD ^a (95% CI)	Average Monthly Spending DD ^a (95% CI)
	Pre-age cap	Post-age cap	Pre-age cap	Post-age cap		
ASD-related health care services						
Total						
Fully Insured ^b (Eligible)	26.8	23.9	\$155	\$120	-4.2 ^{**} (-7.0, -1.5)	-\$69 ^{**} (-\$112, -\$26)
Self-Insured ^c (Ineligible)	21.6	22.9	\$121	\$156		
Inpatient						
Fully Insured (Eligible)	0.5	0.5	\$32	\$30	-0.2 [*] (-0.4, -0.0)	-\$12 (-\$43, \$20)
Self-Insured (Ineligible)	0.5	0.7	\$39	\$48		
Outpatient						
Fully Insured (Eligible)	26.6	23.8	\$123	\$89	-4.1 ^{**} (-6.9, -1.4)	-\$60 [*] (-\$112, -\$8)
Self-Insured (Ineligible)	21.4	22.7	\$81	\$108		
Overall health care services						
Total						
Fully Insured (Eligible)	66.0	67.7	\$522	\$437	1.2 (-2.9, 5.2)	-\$99 ^{**} (-168, -\$30)
Self-Insured (Ineligible)	61.2	61.7	\$478	\$491		
Inpatient						
Fully Insured (Eligible)	0.8	0.9	\$65	\$56	-0.2 (-0.6, 0.1)	-\$11 (-\$79, \$57)
Self-Insured (Ineligible)	0.9	1.2	\$82	\$85		
Outpatient						
Fully Insured (Eligible)	53.0	51.8	\$318	\$247	-2.3 (-4.7, 0.1)	-\$110 ^{**} (-\$181, -\$38)
Self-Insured (Ineligible)	50.4	51.5	\$272	\$312		
Psychotropic medication ^d						
Fully Insured (Eligible)	50.5	54.1	\$188	\$154	4.5 (-1.2, 10.2)	\$16 (-\$13, \$45)
Self-Insured (Ineligible)	45.6	44.7	\$160	\$110		

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Notes: Adjusted models included sex, insurance product type (health maintenance organization, point of service, preferred provider organization, exclusive provider organization, indemnity/other), enrollment in a high-deductible plan, and pharmacy coverage, as well as year, age, and state fixed-effects. Standard errors were estimated using a nonparametric block bootstrap procedure to account for clustering within states. Unit of analysis is the person-month (N=151,976).

^a Difference-in-differences (DID) estimate of change in outcome among those above and below the age cap comparing children eligible and ineligible for mandated coverage of autism spectrum disorder (ASD) services. Percentage decrease or increase in probability of service use and dollar decrease or increase in spending on service category estimated by comparing difference among those below and above the state mandate age cap among those eligible for mandate covered services vs those ineligible for mandate covered services.

^b Individuals on fully insured plans were covered by state laws mandating that insurance companies cover ASD services.

^c Individuals on self-insured plans were not covered by state laws mandating that insurance companies cover ASD services.

^d Analyses restricted to person-months during which enrollee had prescription drug coverage (82,200 person months).

* p<.05;

** p<.01.