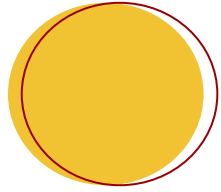


Diagnosis trends in ASD and its contributing factors

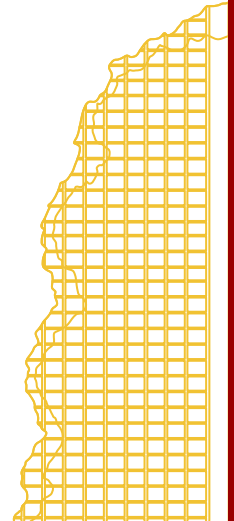




Introduction



- In the United States, 1 in 36 children are diagnosed with autism spectrum disorder (ASD) annually as of 2022.
- characterized by deficits in social communication and behavior.
- The absence of developmental milestones such as making eye contact and responding to calling their name can be signals of the condition.
- This study aims to analyze the association of access to resources in rural areas among boys and girls and progress of diagnosis.



Key objectives

Year 1: assessing diagnosis trends in children with ASD

Year 2: assessing diagnosis trends in children with ASD/assessing trends in medication and behavioral treatment in geographic areas

Year 3: determine whether metropolitan status affects age of diagnosis, determine whether metropolitan status is related to the access of care, determine if gender modified these two variables

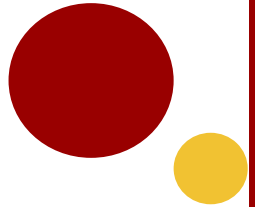


Methods

Year 1: I analyzed medical notes and a data set made by National survey of child's health to understand the effects of late or early diagnosis. This is a quantitative analysis created in Python using the 2022 NSCH code book.

Year 2: An analysis of literature was conducted and a data set made by National survey of child's health to understand the effects of late or early diagnosis. This is a quantitative analysis created in Google.colab using the 2023 NSCH code book.

Year 3: An analysis of literature was conducted and a data set made by National survey of child's health to understand the effects of late or early diagnosis. This is a quantitative analysis created in Python using the 2023 NSCH code book.



Results(year 1):

- 20.3% of children with ASD are not properly diagnosed until they are 15-17
- 2.3% out of 3% have ASD but are not taking medication
- This implies the type of physician can affect the diagnosis

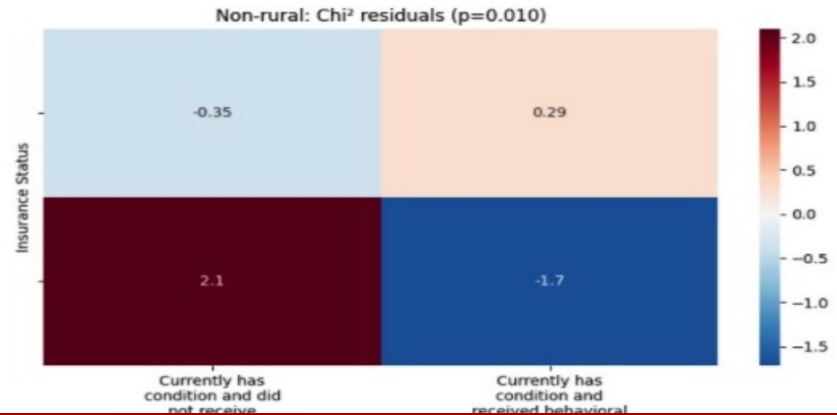
	N	%
ASD diagnosis		
Does not have condition	43,403	81.16
Children age 0-2 years	8,563	16.01
Currently has condition	1,439	2.69
Ever told	76	0.14
Behavioral treatment		
Children age 0-2 years	51,917	97.08
Currently has condition and received behavioral treatment	930	1.74
Did not receive behavioral treatment	63	41.19
Medication for Autism		
Children age 0-2 year	51,917	97.08
Currently has condition but not taking medication	1,241	2.32
Currently as condition and taking medication	323	0.60
Type of doctor		
Children age 0-2 year	51,917	97.08
Specialist	640	1.20
Psychiatrist	311	0.58
Primary Care Provider	260	0.49
Other health care provider	180	0.34
Psychologist/Counselor (school or non-school)	173	0.32
Repeated grades		
No	31,605	59.10
Children age 0-5 years	19,571	36.59
Yes	1,599	2.99
Missing.	706	1.32
Child's grades		
Children age 0-5	19,571	36.59
Mostly A's and B's	11,458	21.42
Mostly A's	11,319	21.16
Mostly B's and C's	4,534	8.48
Mostly C's and D's	1,324	2.48
Mostly D's or lower	470	0.88
Children age 0-5	509	0.95

	N	%
Sex		
Male	27,521	51.46
Female	25,960	48.54
Race		
White, non-Hispanic	34,366	64.26
Hispanic	8,261	15.45
Multi-Race Non-Hispanic	3,917	7.32
Asian, non-Hispanic	3,268	6.11
Black, non-Hispanic	3,233	6.05
American Indian or Alaska Native Non-Hispanic	292	0.55
Native Hawaiian and Other Pacific Islander Non-Hispanic	144	0.27
Age Group		
0-4	14,074	26.98
5-11	19,071	36.55
12-14	8,423	16.14
15-17	10,605	20.33
Poverty Level		
400% FPL or greater	22,933	42.39
200-399% FPL	15,674	28.97
100-199% FPL	8,629	15.95
0-99% FPL	6,867	12.09
Health insurance		
Private health insurance only	36,262	68.26
Public health insurance only	12,219	23.00
public and private insurance	2,457	4.63
Uninsured	2,106	4.11
ASD Diagnosis Status		
Does not currently have condition	39,995	88.77
Currently has condition	5,057	11.23

Results(year 2):

- 2.6% of children with ASD are not properly diagnosed due to lack of insurance coverage in rural areas
- 44 out of 100 children with ASD are not receiving behavioral treatment,
- 40% of children in non-rural areas who face this issue.
- other factors—particularly geographic location—may contribute to disparities in access and care.

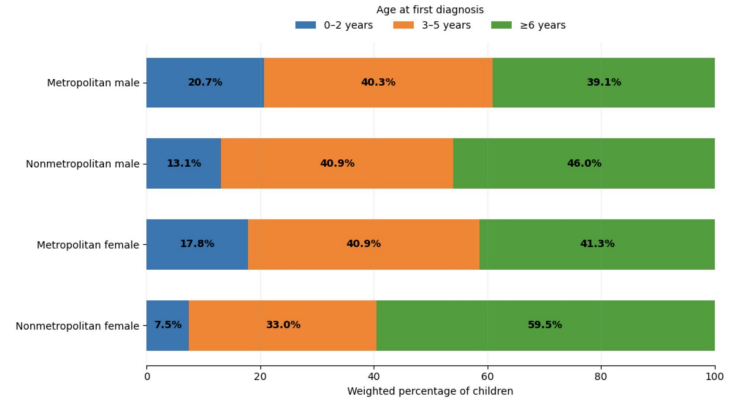
AUTISMTREAT Distribution by Metro Type (100 people each)



Results(year 3):

- boys in metropolitan areas are 2.9% more likely to be diagnosed with ASD between 0-2 than girls in metropolitan areas
- boys in non metropolitan areas are 5.6% more likely to be diagnosed with ASD at 0-2 years old than girls in non metropolitan areas.
- other factors—particularly geographic location and demographics —may contribute to disparities in access and care.

Figure 1. Age at First ASD Diagnosis by Metropolitan Status and Sex



	Step	n
0	Ever diagnosed with ASD, age 6–17	3545
1	Valid age at first ASD diagnosis	3299
2	Metropolitan status available: final cohort	2975

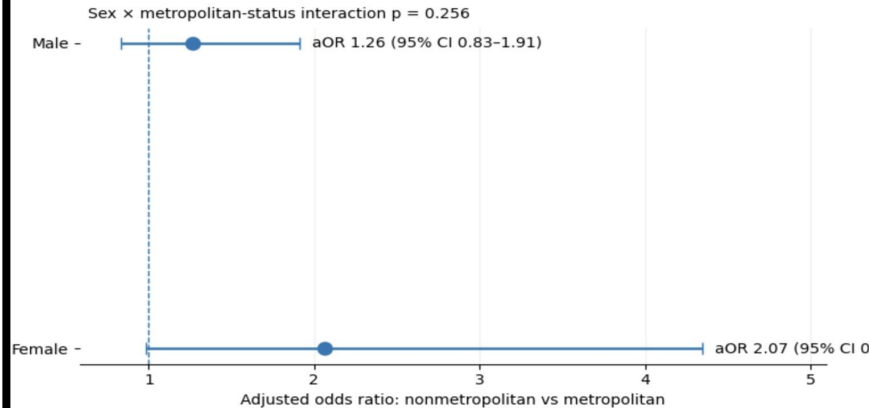
ADJUSTED PROBABILITY DIFFERENCES

	Comparison	Adjusted difference (pp)	95% CI lower	95% CI upper	p-value
0	Overall	7.745	-0.010	15.499	0.050
1	Male	4.991	-3.896	13.877	0.271
2	Female	15.711	-0.163	31.585	0.052

ADJUSTED ODDS RATIOS

	Comparison	Adjusted OR	95% CI lower	95% CI upper	p-value
0	Male: Nonmetropolitan vs Metropolitan	1.262	0.835	1.909	0.270
1	Female: Nonmetropolitan vs Metropolitan	2.065	0.982	4.343	0.056
2	Sex interaction: ratio of female OR to male OR	1.636	0.700	3.824	0.256

Figure 2. Adjusted Odds of First ASD Diagnosis at Age ≥6



	Characteristic	Overall	Metropolitan	Nonmetropolitan
0	Unweighted n	2975	2490	485
1	Female	26.1% (22.8-29.7)	25.7% (22.1-29.8)	28.6% (22.5-35.5)
2	Hispanic	23.4% (20.3-26.9)	25.0% (21.5-28.8)	11.5% (7.5-17.2)
3	Non-Hispanic White	48.5% (44.8-52.2)	45.9% (41.9-49.9)	68.6% (61.6-74.8)
4	College degree+ household	47.1% (43.5-50.7)	49.1% (45.0-53.1)	32.0% (26.3-38.1)
5	First ASD diagnosis at age ≥6	40.8% (37.2-44.6)	39.7% (35.7-43.8)	49.8% (42.8-56.8)