

Progress and disparities in early identification of autism spectrum disorder: ADDM Network, 2002–2016

Supplementals

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Data summary

Table S1

Denominators, number of children aged 8 who met the ADDM surveillance case definition for ASD, and among those children who met the case definition the number identified (with a recorded ASD diagnosis or special educational eligibility) overall and by site by surveillance year.

Site	2002			2004			2006			2008			2010			2012			2014			2016		
	Denominator	ASD	Identified	Denominator	ASD	Identified	Denominator	ASD	Identified	Denominator	ASD	Identified	Denominator	ASD	Identified	Denominator	ASD	Identified	Denominator	ASD	Identified	Denominator	ASD	Identified
All-Sites	407578	2680	1810	172335	1370	982	308038	2753	2001	337093	3814	2804	363749	5333	4108	328824	4866	3836	325483	5469	4256	275419	5108	4223
ID Sites*	206928	2027	1347	113072	1004	704	175457	2024	1426	157855	2891	2101	242120	4224	3239	267398	3649	2869	265113	4108	3248	259784	3951	3293
AL	35472	116	70	11676	54	36	35126	212	133	36566	172	116	21833	124	93									
AR	36472	251	191							4940	52	36	38956	605	457	14153	125	96	39992	522	456	40225	606	545
AZ	45113	279	157	13620	133	57	41650	502	306	32601	506	327	33768	529	379	32615	493	389	24952	349	294	17656	282	265
CO	11020	64	35				7184	54	34	7725	91	57	38806	384	233	40538	435	279	41128	572	315	40874	537	373
FL							27615	116	101	29366	210	149												
GA	44299	336	231	45190	401	297	46621	472	349	50427	600	471	48529	752	622	49720	770	637	51161	866	715	24113	456	382
MD†	29722	199	145	20981	180	150	26489	243	213	27022	336	251	27605	458	382	9577	172	144	9955	199	168	9993	192	157
MN																			9767	233	180	13728	313	248
MO	28049	205	142	26970	221	166	26533	321	251	25668	357	279	25367	359	308	25870	300	261	25333	356	312	15635	213	194
NC	20725	135	85	20187	176	128	22195	230	158	36913	524	361	37783	654	463	38913	653	476	30283	527	417	19291	489	375
NJ	29748	314	213							7082	145	98	31723	696	521	32581	803	652	32935	964	697	33031	1036	847
PA	21061	111	86				17886	150	121	18440	245	208												
SC	23191	140	74	22399	117	74	22681	196	137	23769	264	198				24356	300	230						
TN																			24940	387	298	25839	405	320
UT	26108	196	148							2123	45	31	23756	442	359	24945	431	364						
WI	35126	181	129	11312	88	74	34058	257	198	34451	267	222	35623	330	291	35556	384	308	35037	494	404	35034	579	517
WV	21472	153	104																					

* Sites included in ID calculations (based on having at least 80% complete ID case status data in 2002, at least 70% from 2004 to 2014, and at least 60% in 2016):

2002 - AR, AZ, CO, GA, NC, SC, UT

2004 - AL, AZ, GA, NC, SC

2006 - AL, AZ, CO, GA, NC, SC

2008 - AR, AZ, GA, NC, NJ, SC, UT

2010 - AR, AZ, GA, MD, NC, NJ, UT

2012 - AR, AZ, CO, GA, MD, NC, NJ, SC, UT

2014 - AR, AZ, CO, GA, MD, MN, NC, NJ, TN

2016 - AR, AZ, CO, GA, MD, MN, NC, NJ, TN, WI

† 'Education and health records review area' used for Maryland from 2012 prevalence report.

Progress in early identification of ASD over time

Figure S1

Median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children by year in the ADDM Network

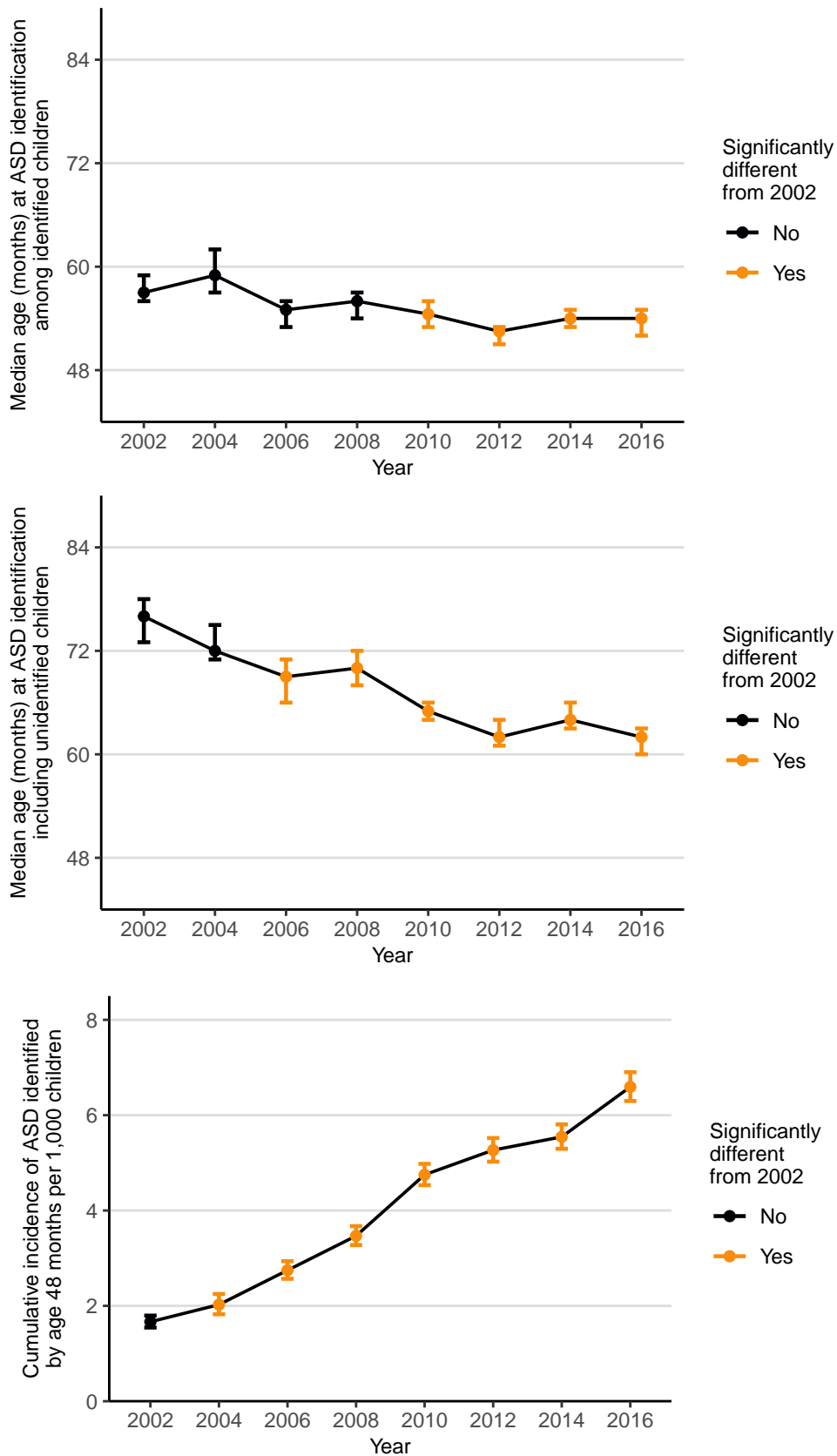


Table S2

Median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children by year in the ADDM Network

Year	Median among identified			Median including unidentified			Cumulative incidence		
	Median age at identification (95% CI)	Difference from 2002	P	Median age at identification (95% CI)	Difference from 2002	P	Cumulative incidence by age 48 months (95% CI)	Difference from 2002 (95% CI)	Risk relative to 2002 (95% CI)
2002	57 (56-59)			76 (73-78)			1.7 (1.5 - 1.8)		
2004	59 (57-62)	2	0.25	72 (71-75)	-4	0.08	2.0 (1.8 - 2.2)	0.4 (0.1 - 0.6)	1.2 (1.1 - 1.4)
2006	55 (53-56)	-2	0.27	69 (66-71)	-7	0	2.7 (2.6 - 2.9)	1.1 (0.9 - 1.3)	1.6 (1.5 - 1.8)
2008	56 (54-57)	-1	0.68	70 (68-72)	-6	0	3.5 (3.3 - 3.7)	1.8 (1.6 - 2.0)	2.1 (1.9 - 2.3)
2010	54.5 (53-56)	-2.5	0.01	65 (64-66)	-11	0	4.8 (4.5 - 5.0)	3.1 (2.8 - 3.3)	2.9 (2.6 - 3.1)
2012	52.5 (51-53)	-4.5	0	62 (61-64)	-14	0	5.3 (5.0 - 5.5)	3.6 (3.3 - 3.9)	3.2 (2.9 - 3.5)
2014	54 (53-55)	-3	0.01	64 (63-66)	-12	0	5.5 (5.3 - 5.8)	3.9 (3.6 - 4.2)	3.3 (3.0 - 3.6)
2016	54 (52-55)	-3	0.01	62 (60-63)	-14	0	6.6 (6.3 - 6.9)	4.9 (4.6 - 5.3)	4.0 (3.6 - 4.3)

Highlighted P values, risk differences, and risk ratios are significant.
Ages are represented in months.

Geographic variability in progress over time

Figure S2

Median age at autism spectrum disorder (ASD) identification among identified children and median age at ASD identification including unidentified children by year at nine sites participating in the ADDM Network from 2008–2016

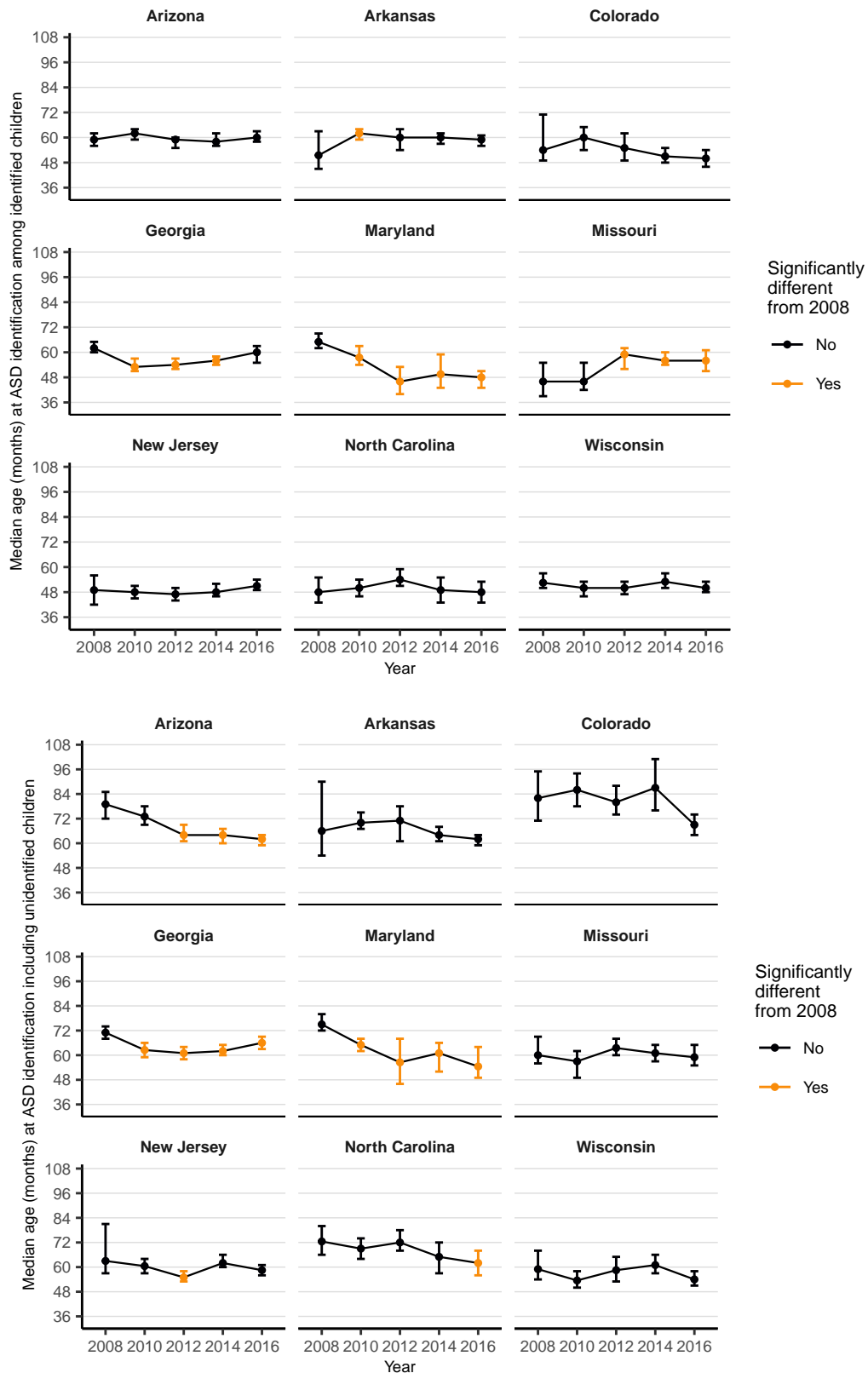


Table S3

Median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children by year at nine sites participating in ADDM from 2008–2016

Site	Year	Median among identified			Median including unidentified			Cumulative incidence		
		Median age at identification (95% CI)	Difference from 2008	P	Median age at identification (95% CI)	Difference from 2008	P	Cumulative incidence by age 48 months (95% CI)	Difference from 2008 (95% CI)	Risk relative to 2008 (95% CI)
Arizona	2008	59 (56-62)			79 (72-85)			3.4 (2.8 - 4.1)		
Arizona	2010	62 (59-64)	3	0.22	73 (69-78)	-6	0.16	3.6 (3.0 - 4.3)	0.2 (-0.7 - 1.1)	1.1 (0.8 - 1.4)
Arizona	2012	59 (55-60)	0	1	64 (61-69)	-15	0	4.3 (3.6 - 5.0)	0.9 (-0.1 - 1.8)	1.3 (1.0 - 1.6)
Arizona	2014	58 (56-62)	-1	0.82	64 (60-67)	-15	0	3.8 (3.1 - 4.6)	0.4 (-0.6 - 1.4)	1.1 (0.8 - 1.5)
Arizona	2016	60 (58-63)	1	0.74	62 (59-64)	-17	0	4.1 (3.3 - 5.2)	0.7 (-0.4 - 1.9)	1.2 (0.9 - 1.6)
Arkansas	2008	51.5 (45-63)			66 (54-90)			3.2 (2.0 - 5.3)		
Arkansas	2010	62 (59-64)	10.5	0.03	70 (67-75)	4	0.56	3.5 (2.9 - 4.1)	0.2 (-1.9 - 1.6)	1.1 (0.6 - 1.8)
Arkansas	2012	60 (54-64)	8.5	0.15	71 (61-78)	5	0.81	2.3 (1.7 - 3.3)	-0.9 (-3.0 - 0.7)	0.7 (0.4 - 1.3)
Arkansas	2014	60 (57-62)	8.5	0.12	64 (61-68)	-2	0.8	3.9 (3.3 - 4.5)	0.6 (-1.5 - 2.0)	1.2 (0.7 - 2.0)
Arkansas	2016	59 (56-61)	7.5	0.15	62 (59-64)	-4	0.4	4.6 (4.0 - 5.3)	1.4 (-0.7 - 2.8)	1.4 (0.9 - 2.4)
Colorado	2008	54 (49-71)			82 (71-95)			2.7 (1.8 - 4.2)		
Colorado	2010	60 (54-65)	6	0.36	86 (78-94)	4	0.8	2.2 (1.8 - 2.7)	-0.5 (-2.0 - 0.5)	0.8 (0.5 - 1.3)
Colorado	2012	55 (49-62)	1	0.94	80 (74-88)	-2	0.88	3.0 (2.5 - 3.6)	0.3 (-1.2 - 1.4)	1.1 (0.7 - 1.7)
Colorado	2014	51 (48-55)	-3	0.49	87 (76-101)	5	0.71	3.5 (2.9 - 4.1)	0.7 (-0.8 - 1.9)	1.3 (0.8 - 2.0)
Colorado	2016	50 (46-54)	-4	0.44	69 (64-74)	-13	0.08	4.5 (3.9 - 5.1)	1.7 (0.2 - 2.9)	1.6 (1.0 - 2.6)
Georgia	2008	62 (60-65)			71 (68-74)			3.1 (2.7 - 3.6)		
Georgia	2010	53 (51-57)	-9	0	62.5 (59-66)	-8.5	0	5.4 (4.8 - 6.1)	2.3 (1.5 - 3.2)	1.7 (1.4 - 2.1)
Georgia	2012	54 (52-57)	-8	0	61 (58-64)	-10	0	5.3 (4.7 - 6.0)	2.2 (1.4 - 3.0)	1.7 (1.4 - 2.1)
Georgia	2014	56 (54-58)	-6	0	62 (60-65)	-9	0	5.6 (5.0 - 6.3)	2.5 (1.7 - 3.3)	1.8 (1.5 - 2.2)
Georgia	2016	60 (55-63)	-2	0.54	66 (63-69)	-5	0.03	5.8 (4.9 - 6.8)	2.7 (1.6 - 3.8)	1.9 (1.5 - 2.3)
Maryland	2008	65 (62-69)			75 (72-80)			2.7 (2.2 - 3.4)		
Maryland	2010	57.5 (54-63)	-7.5	0.01	65 (62-68)	-10	0	5.2 (4.4 - 6.1)	2.5 (1.4 - 3.6)	1.9 (1.4 - 2.5)
Maryland	2012	46 (40-53)	-19	0	56.5 (46-68)	-18.5	0	8.5 (6.8 - 10.5)	5.7 (3.9 - 7.8)	3.1 (2.3 - 4.2)
Maryland	2014	49.5 (43-59)	-15.5	0	61 (52-66)	-14	0	8.0 (6.5 - 10.0)	5.3 (3.6 - 7.3)	2.9 (2.1 - 4.0)
Maryland	2016	48 (43-51)	-17	0	54.5 (49-64)	-20.5	0	8.0 (6.4 - 10.0)	5.3 (3.6 - 7.3)	2.9 (2.1 - 4.0)
Missouri	2008	46 (39-55)			60 (56-69)			5.6 (4.7 - 6.6)		
Missouri	2010	46 (42-55)	0	1	57 (49-62)	-3	0.42	6.3 (5.4 - 7.4)	0.8 (-0.6 - 2.1)	1.1 (0.9 - 1.4)
Missouri	2012	59 (52-62)	13	0	63.5 (60-68)	3.5	0.45	4.1 (3.4 - 5.0)	-1.5 (-2.7 - -0.3)	0.7 (0.6 - 0.9)
Missouri	2014	56 (54-60)	10	0	61 (57-65)	1	0.88	4.7 (4.0 - 5.7)	-0.8 (-2.1 - 0.4)	0.9 (0.7 - 1.1)
Missouri	2016	56 (51-61)	10	0.02	59 (55-65)	-1	0.85	4.9 (3.9 - 6.1)	-0.7 (-2.1 - 0.8)	0.9 (0.7 - 1.2)
New Jersey	2008	49 (42-56)			63 (57-81)			6.8 (5.1 - 9.0)		
New Jersey	2010	48 (45-51)	-1	0.86	60.5 (57-64)	-2.5	0.6	8.4 (7.4 - 9.4)	1.6 (-0.8 - 3.6)	1.2 (0.9 - 1.7)
New Jersey	2012	47 (44-50)	-2	0.69	55 (53-58)	-8	0.04	10.4 (9.4 - 11.6)	3.6 (1.2 - 5.7)	1.5 (1.1 - 2.1)
New Jersey	2014	48 (46-52)	-1	0.87	62 (60-66)	-1	0.87	10.7 (9.6 - 11.8)	3.9 (1.5 - 5.9)	1.6 (1.2 - 2.1)
New Jersey	2016	51 (49-54)	2	0.66	58.5 (56-61)	-4.5	0.18	11.9 (10.8 - 13.2)	5.2 (2.7 - 7.2)	1.8 (1.3 - 2.4)
North Carolina	2008	48 (43-55)			72.5 (66-80)			4.9 (4.2 - 5.7)		
North Carolina	2010	50 (46-54)	2	0.75	69 (64-74)	-3.5	0.33	6.0 (5.3 - 6.8)	1.1 (0.0 - 2.2)	1.2 (1.0 - 1.5)
North Carolina	2012	54 (51-59)	6	0.09	72 (68-78)	-0.5	0.89	5.3 (4.7 - 6.1)	0.4 (-0.6 - 1.5)	1.1 (0.9 - 1.3)
North Carolina	2014	49 (43-55)	1	1	65 (57-72)	-7.5	0.09	6.9 (6.0 - 7.9)	2.0 (0.8 - 3.2)	1.4 (1.1 - 1.7)
North Carolina	2016	48 (43-53)	0	1	62 (56-68)	-10.5	0.01	9.9 (8.6 - 11.4)	5.0 (3.5 - 6.6)	2.0 (1.6 - 2.5)
Wisconsin	2008	52.5 (50-57)			59 (54-68)			2.8 (2.3 - 3.4)		
Wisconsin	2010	50 (46-53)	-2.5	0.34	53.5 (50-58)	-5.5	0.13	4.0 (3.4 - 4.7)	1.2 (0.3 - 2.0)	1.4 (1.1 - 1.8)
Wisconsin	2012	50 (47-53)	-2.5	0.31	58.5 (53-65)	-0.5	0.89	4.2 (3.6 - 4.9)	1.4 (0.6 - 2.3)	1.5 (1.2 - 2.0)
Wisconsin	2014	53 (50-57)	0.5	0.88	61 (57-66)	2	0.73	4.8 (4.2 - 5.6)	2.0 (1.1 - 3.0)	1.7 (1.3 - 2.2)
Wisconsin	2016	50 (48-53)	-2.5	0.36	54 (51-58)	-5	0.19	7.1 (6.3 - 8.0)	4.3 (3.3 - 5.4)	2.5 (2.0 - 3.2)

Highlighted P values, risk differences, and risk ratios are significant.
Ages are represented in months.

Differences in early identification by co-occurring intellectual disability

Figure S3

Difference in incidence of autism spectrum disorder (ASD) identified per 1,000 children aged 8 years for each month of age by co-occurring intellectual disability by year compared to 2002 in the ADDM Network

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status.



Table S4

Comparison of median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children between children with and without co-occurring intellectual disability (ID) by year in the ADDM Network

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status.

Year	Median among identified				Median including unidentified				Cumulative incidence			
	With ID	Without ID	Difference	P	With ID	Without ID	Difference	P	With ID	Without ID	With ID to Without ID difference	With ID to Without ID ratio
2002	54 (52-56)	63 (60-66)	-9	0	67 (64-72)	86 (83-90)	-19	0	0.8 (0.7 - 1.0)	0.6 (0.5 - 0.8)	0.2 (0.0 - 0.4)	1.3 (1.0 - 1.6)
2004	54 (50-59)	68 (63-71)	-14	0	67 (63-72)	81 (77-86)	-14	0	1.0 (0.8 - 1.2)	0.8 (0.6 - 0.9)	0.2 (0.0 - 0.5)	1.3 (1.0 - 1.7)
2006	48 (46-50)	64 (63-66)	-16	0	59 (56-62)	81 (78-83)	-22	0	1.3 (1.1 - 1.4)	0.9 (0.8 - 1.0)	0.4 (0.1 - 0.6)	1.4 (1.1 - 1.7)
2008	49 (46-52)	63 (62-65)	-14	0	60 (58-62)	79 (76-81)	-19	0	1.8 (1.6 - 2.0)	1.7 (1.5 - 2.0)	0.1 (-0.2 - 0.3)	1.0 (0.9 - 1.2)
2010	46 (44-48)	61 (60-63)	-15	0	54 (52-57)	73 (71-74)	-19	0	2.1 (1.9 - 2.2)	2.5 (2.3 - 2.7)	-0.4 (-0.7 - -0.1)	0.8 (0.7 - 0.9)
2012	48 (45-49)	58 (57-60)	-10	0	53 (51-55)	70 (68-72)	-17	0	1.7 (1.5 - 1.8)	2.6 (2.4 - 2.8)	-0.9 (-1.1 - -0.6)	0.7 (0.6 - 0.7)
2014	46 (45-49)	60 (58-61)	-14	0	53 (50-55)	71 (70-73)	-18	0	1.9 (1.7 - 2.1)	2.6 (2.4 - 2.8)	-0.7 (-1.0 - -0.4)	0.7 (0.7 - 0.8)
2016	45 (44-48)	60 (59-61)	-15	0	49 (48-51)	68 (66-69)	-19	0	2.4 (2.3 - 2.6)	2.9 (2.7 - 3.1)	-0.4 (-0.7 - -0.1)	0.9 (0.8 - 1.0)

Highlighted P values, risk differences, and risk ratios are significant.

Ages are represented in months.

Table S5

Median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children for children with and without co-occurring intellectual disability (ID) by year in the ADDM Network

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status.

ID Case Status	Year	Median among identified			Median including unidentified			Cumulative incidence		
		Median age at identification (95% CI)	Difference from 2002	P	Median age at identification (95% CI)	Difference from 2002	P	Cumulative incidence by age 48 months (95% CI)	Difference from 2002 (95% CI)	Risk relative to 2002 (95% CI)
Without ID	2002	63 (60-66)			86 (83-90)			0.6 (0.5 - 0.8)		
Without ID	2004	68 (63-71)	5	0.04	81 (77-86)	-5	0.14	0.8 (0.6 - 0.9)	0.1 (-0.1 - 0.3)	1.2 (0.9 - 1.6)
Without ID	2006	64 (63-66)	1	0.8	81 (78-83)	-5	0.04	0.9 (0.8 - 1.0)	0.3 (0.1 - 0.4)	1.4 (1.1 - 1.8)
Without ID	2008	63 (62-65)	0	1	79 (76-81)	-7	0	1.7 (1.5 - 2.0)	1.1 (0.9 - 1.3)	2.7 (2.2 - 3.3)
Without ID	2010	61 (60-63)	-2	0.37	73 (71-74)	-13	0	2.5 (2.3 - 2.7)	1.8 (1.6 - 2.1)	3.8 (3.2 - 4.6)
Without ID	2012	58 (57-60)	-5	0	70 (68-72)	-16	0	2.6 (2.4 - 2.8)	1.9 (1.7 - 2.1)	4.0 (3.3 - 4.8)
Without ID	2014	60 (58-61)	-3	0.06	71 (70-73)	-15	0	2.6 (2.4 - 2.8)	2.0 (1.7 - 2.2)	4.0 (3.4 - 4.9)
Without ID	2016	60 (59-61)	-3	0.06	68 (66-69)	-18	0	2.9 (2.7 - 3.1)	2.2 (2.0 - 2.5)	4.5 (3.7 - 5.4)
With ID	2002	54 (52-56)			67 (64-72)			0.8 (0.7 - 1.0)		
With ID	2004	54 (50-59)	0	1	67 (63-72)	0	1	1.0 (0.8 - 1.2)	0.2 (0.0 - 0.4)	1.2 (0.9 - 1.5)
With ID	2006	48 (46-50)	-6	0.01	59 (56-62)	-8	0	1.3 (1.1 - 1.4)	0.4 (0.2 - 0.6)	1.5 (1.2 - 1.8)
With ID	2008	49 (46-52)	-5	0.01	60 (58-62)	-7	0	1.8 (1.6 - 2.0)	1.0 (0.7 - 1.2)	2.1 (1.8 - 2.6)
With ID	2010	46 (44-48)	-8	0	54 (52-57)	-13	0	2.1 (1.9 - 2.2)	1.2 (1.0 - 1.5)	2.5 (2.1 - 2.9)
With ID	2012	48 (45-49)	-6	0	53 (51-55)	-14	0	1.7 (1.5 - 1.8)	0.9 (0.7 - 1.1)	2.0 (1.7 - 2.4)
With ID	2014	46 (45-49)	-8	0	53 (50-55)	-14	0	1.9 (1.7 - 2.1)	1.1 (0.9 - 1.3)	2.3 (1.9 - 2.7)
With ID	2016	45 (44-48)	-9	0	49 (48-51)	-18	0	2.4 (2.3 - 2.6)	1.6 (1.4 - 1.8)	2.9 (2.5 - 3.5)

Highlighted P values, risk differences, and risk ratios are significant.

Ages are represented in months.

Differences in early identification by race/ethnicity

Figure S4

Median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of autism spectrum disorder (ASD) identification by age 48 months per 1,000 children by race/ethnicity by year in the ADDM Network

Note: Missing upper limit of 95% confidence interval could not be calculated because it extends into censored values.

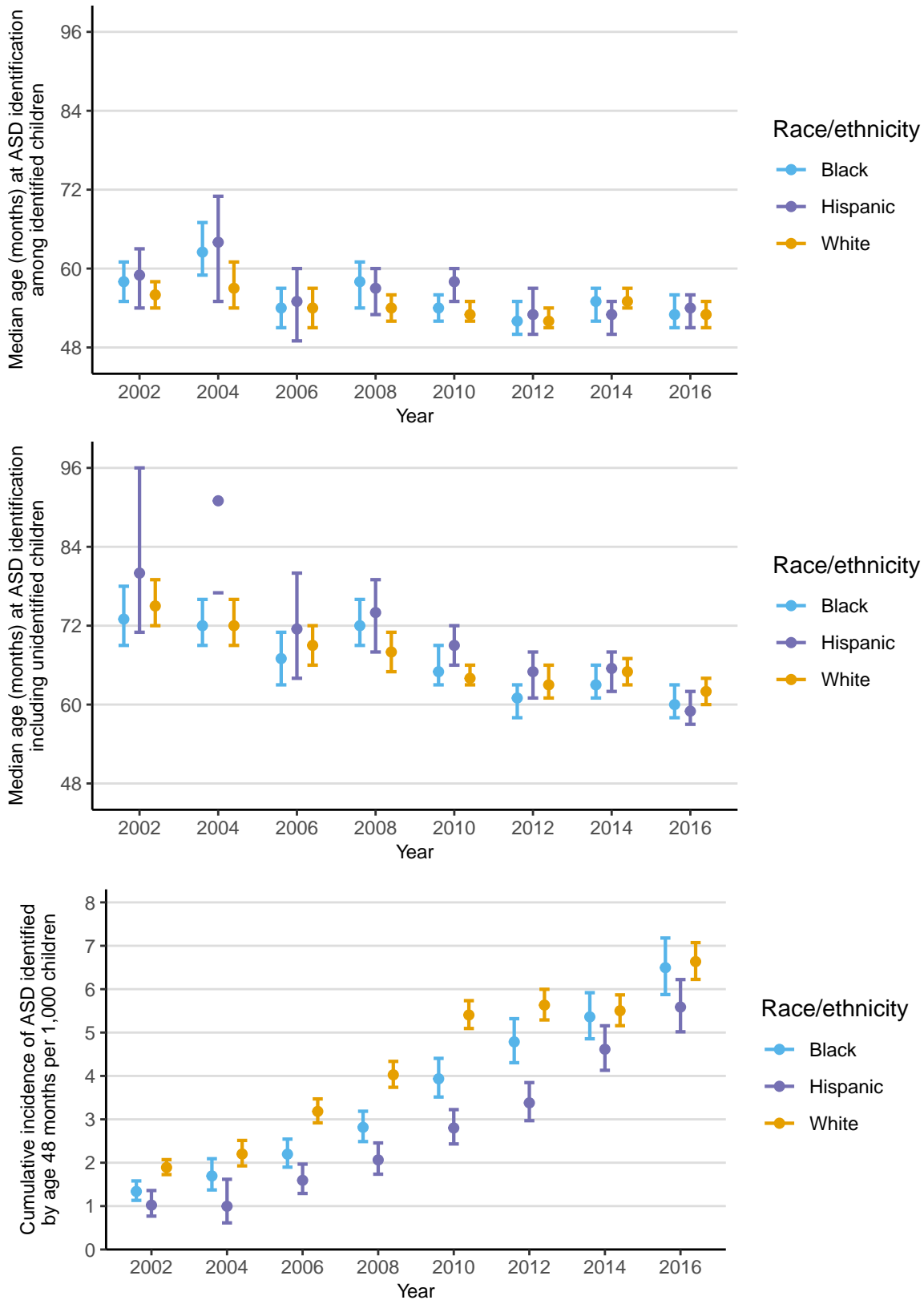


Table S6

Median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children by race/ethnicity by year in the ADDM Network

Race/ethnicity	Year	Median among identified			Median including unidentified			Cumulative incidence		
		Median age at identification (95% CI)	Difference from 2002	P	Median age at identification (95% CI)	Difference from 2002	P	Cumulative incidence by age 48 months (95% CI)	Difference from 2002 (95% CI)	Risk relative to 2002 (95% CI)
Black	2002	58 (55-61)			73 (69-78)			1.3 (1.1 - 1.6)		
Black	2004	62.5 (59-67)	4.5	0.07	72 (69-76)	-1	0.79	1.7 (1.4 - 2.1)	0.4 (0.0 - 0.8)	1.3 (1.0 - 1.7)
Black	2006	54 (51-57)	-4	0.08	67 (63-71)	-6	0.08	2.2 (1.9 - 2.5)	0.9 (0.5 - 1.3)	1.6 (1.3 - 2.0)
Black	2008	58 (54-61)	0	1	72 (69-76)	-1	0.96	2.8 (2.5 - 3.2)	1.5 (1.1 - 1.9)	2.1 (1.7 - 2.6)
Black	2010	54 (52-56)	-4	0.12	65 (63-69)	-8	0.01	3.9 (3.5 - 4.4)	2.6 (2.1 - 3.1)	2.9 (2.4 - 3.6)
Black	2012	52 (50-55)	-6	0	61 (58-63)	-12	0	4.8 (4.3 - 5.3)	3.4 (2.9 - 4.0)	3.6 (2.9 - 4.4)
Black	2014	55 (52-57)	-3	0.26	63 (61-66)	-10	0	5.4 (4.9 - 5.9)	4.0 (3.5 - 4.6)	4.0 (3.3 - 4.9)
Black	2016	53 (51-56)	-5	0.02	60 (58-63)	-13	0	6.5 (5.9 - 7.2)	5.2 (4.5 - 5.9)	4.9 (4.0 - 5.9)
Hispanic	2002	59 (54-63)			80 (71-96)			1.0 (0.8 - 1.4)		
Hispanic	2004	64 (55-71)	5	0.25	91 (77-NA)	11	0.32	1.0 (0.6 - 1.6)	0.0 (-0.5 - 0.6)	1.0 (0.6 - 1.7)
Hispanic	2006	55 (49-60)	-4	0.41	71.5 (64-80)	-8.5	0.22	1.6 (1.3 - 2.0)	0.6 (0.1 - 1.0)	1.6 (1.1 - 2.2)
Hispanic	2008	57 (53-60)	-2	0.53	74 (68-79)	-6	0.29	2.1 (1.7 - 2.5)	1.0 (0.6 - 1.5)	2.0 (1.4 - 2.8)
Hispanic	2010	58 (55-60)	-1	0.82	69 (66-72)	-11	0.01	2.8 (2.4 - 3.2)	1.8 (1.3 - 2.3)	2.7 (2.0 - 3.8)
Hispanic	2012	53 (50-57)	-6	0.19	65 (61-68)	-15	0	3.4 (3.0 - 3.8)	2.4 (1.8 - 2.9)	3.3 (2.4 - 4.5)
Hispanic	2014	53 (50-55)	-6	0.1	65.5 (62-68)	-14.5	0	4.6 (4.1 - 5.2)	3.6 (3.0 - 4.2)	4.5 (3.3 - 6.1)
Hispanic	2016	54 (51-56)	-5	0.16	59 (57-62)	-21	0	5.6 (5.0 - 6.2)	4.6 (3.9 - 5.3)	5.5 (4.0 - 7.4)
White	2002	56 (54-58)			75 (72-79)			1.9 (1.7 - 2.1)		
White	2004	57 (54-61)	1	0.74	72 (69-76)	-3	0.44	2.2 (1.9 - 2.5)	0.3 (0.0 - 0.7)	1.2 (1.0 - 1.4)
White	2006	54 (51-57)	-2	0.33	69 (66-72)	-6	0.01	3.2 (2.9 - 3.5)	1.3 (1.0 - 1.6)	1.7 (1.5 - 1.9)
White	2008	54 (52-56)	-2	0.34	68 (65-71)	-7	0	4.0 (3.7 - 4.3)	2.1 (1.8 - 2.5)	2.1 (1.9 - 2.4)
White	2010	53 (52-55)	-3	0.07	64 (63-66)	-11	0	5.4 (5.1 - 5.7)	3.5 (3.2 - 3.9)	2.9 (2.6 - 3.2)
White	2012	52 (51-54)	-4	0.01	63 (61-66)	-12	0	5.6 (5.3 - 6.0)	3.7 (3.4 - 4.1)	3.0 (2.7 - 3.3)
White	2014	55 (54-57)	-1	0.89	65 (63-67)	-10	0	5.5 (5.2 - 5.9)	3.6 (3.2 - 4.0)	2.9 (2.6 - 3.3)
White	2016	53 (51-55)	-3	0.06	62 (60-64)	-13	0	6.6 (6.2 - 7.1)	4.7 (4.3 - 5.2)	3.5 (3.1 - 3.9)

Highlighted P values, risk differences, and risk ratios are significant.

Ages are represented in months.

NA = Not applicable (upper limit of 95% confidence interval could not be calculated because it extends into censored values).

Table S7

Comparison of median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children between Black or Hispanic children and White children by year in the ADDM Network

Year	White			Black						Hispanic											
	Median among identified	Median including unidentified	Cumulative incidence	Median among identified	B to W diff	P	Median including unidentified	B to W diff	P	Cumulative incidence	B to W diff	B to W ratio	Median among identified	H to W diff	P	Median including unidentified	H to W diff	P	Cumulative incidence	H to W diff	H to W ratio
2002	56 (54-58)	75 (72-79)	1.9 (1.7 - 2.1)	58 (55-61)	2	0.57	73 (69-78)	-2	0.65	1.3 (1.1 - 1.6)	-0.6 (-0.8 - -0.3)	0.7 (0.6 - 0.9)	59 (54-63)	3	0.44	80 (71-96)	5	0.4	1.0 (0.8 - 1.4)	-0.9 (-1.2 - -0.5)	0.5 (0.4 - 0.7)
2004	57 (54-61)	72 (69-76)	2.2 (1.9 - 2.5)	62.5 (59-67)	5.5	0.1	72 (69-76)	0	1	1.7 (1.4 - 2.1)	-0.5 (-1.0 - 0.0)	0.8 (0.6 - 1.0)	64 (55-71)	7	0.23	91 (77-NA)	19	0	1.0 (0.6 - 1.6)	-1.2 (-1.7 - -0.5)	0.5 (0.3 - 0.7)
2006	54 (51-57)	69 (66-72)	3.2 (2.9 - 3.5)	54 (51-57)	0	1	67 (63-71)	-2	0.61	2.2 (1.9 - 2.5)	-1.0 (-1.4 - -0.6)	0.7 (0.6 - 0.8)	55 (49-60)	1	0.86	71.5 (64-80)	2.5	0.58	1.6 (1.3 - 2.0)	-1.6 (-2.0 - -1.1)	0.5 (0.4 - 0.6)
2008	54 (52-56)	68 (65-71)	4.0 (3.7 - 4.3)	58 (54-61)	4	0.08	72 (69-76)	4	0.17	2.8 (2.5 - 3.2)	-1.2 (-1.7 - -0.7)	0.7 (0.6 - 0.8)	57 (53-60)	3	0.31	74 (68-79)	6	0.06	2.1 (1.7 - 2.5)	-2.0 (-2.4 - -1.5)	0.5 (0.4 - 0.6)
2010	53 (52-55)	64 (63-66)	5.4 (5.1 - 5.7)	54 (52-56)	1	0.97	65 (63-69)	1	0.76	3.9 (3.5 - 4.4)	-1.5 (-2.0 - -0.9)	0.7 (0.6 - 0.8)	58 (55-60)	5	0.02	69 (66-72)	5	0.02	2.8 (2.4 - 3.2)	-2.6 (-3.1 - -2.1)	0.5 (0.4 - 0.6)
2012	52 (51-54)	63 (61-66)	5.6 (5.3 - 6.0)	52 (50-55)	0	1	61 (58-63)	-2	0.52	4.8 (4.3 - 5.3)	-0.8 (-1.5 - -0.2)	0.8 (0.8 - 1.0)	53 (50-57)	1	0.92	65 (61-68)	2	0.61	3.4 (3.0 - 3.8)	-2.3 (-2.8 - -1.7)	0.6 (0.5 - 0.7)
2014	55 (54-57)	65 (63-67)	5.5 (5.2 - 5.9)	55 (52-57)	0	1	63 (61-66)	-2	0.46	5.4 (4.9 - 5.9)	-0.1 (-0.8 - 0.5)	1.0 (0.9 - 1.1)	53 (50-55)	-2	0.34	65.5 (62-68)	0.5	0.79	4.6 (4.1 - 5.2)	-0.9 (-1.5 - -0.2)	0.8 (0.7 - 1.0)
2016	53 (51-55)	62 (60-64)	6.6 (6.2 - 7.1)	53 (51-56)	0	1	60 (58-63)	-2	0.39	6.5 (5.9 - 7.2)	-0.1 (-0.9 - 0.7)	1.0 (0.9 - 1.1)	54 (51-56)	1	1	59 (57-62)	-3	0.13	5.6 (5.0 - 6.2)	-1.0 (-1.8 - -0.3)	0.8 (0.7 - 1.0)

Highlighted P values, risk differences, and risk ratios are significant.

Ages are represented in months.

NA = Not applicable (upper limit of 95% confidence interval could not be calculated because it extends into censored values).

Differences in early identification by race/ethnicity and co-occurring intellectual disability

Figure S5

Median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of autism spectrum disorder (ASD) identification by age 48 months per 1,000 children by race/ethnicity and co-occurring intellectual disability by year in the ADDM Network

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status. Missing upper limits of 95% confidence intervals could not be calculated because they extend into censored values.

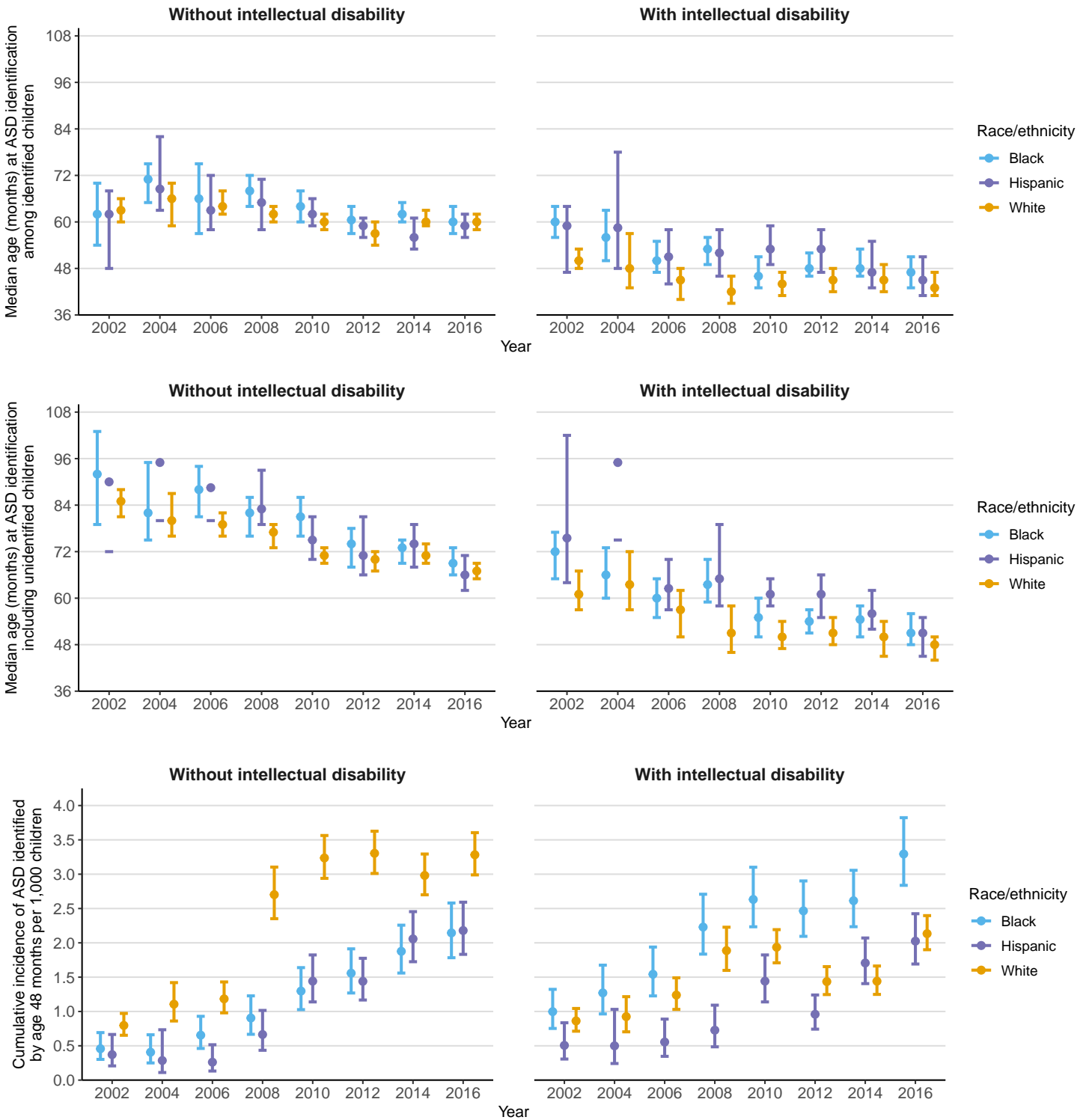


Figure S6

Cumulative incidence of autism spectrum disorder (ASD) identification per 1,000 children at each month of age by race/ethnicity and co-occurring intellectual disability in 2016 in the ADDM Network

The line indicates cumulative incidence of ASD identified by age 48 months per 1,000 children.

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status.

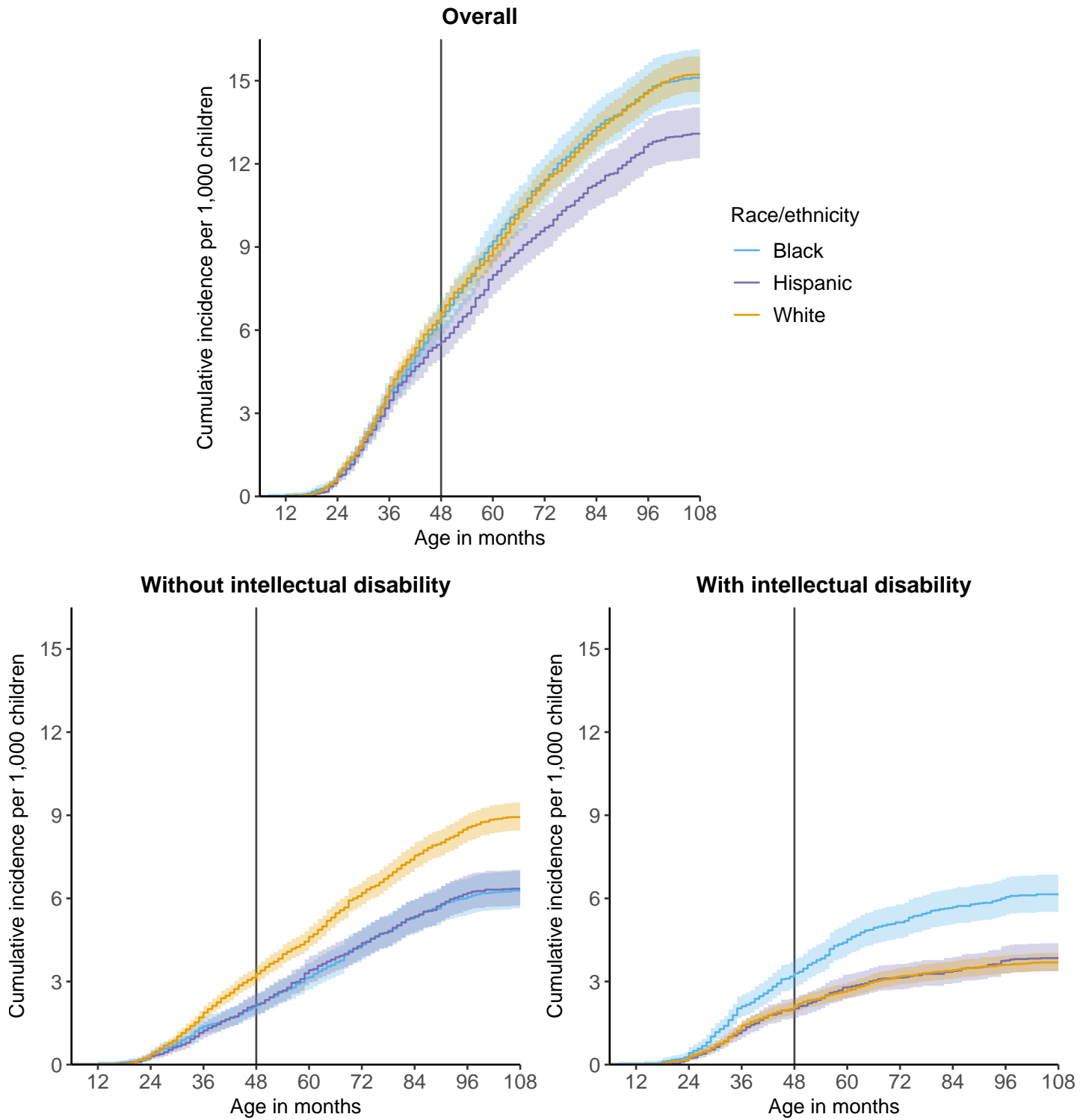


Table S8

Differences between Black or Hispanic children and White children in median age at autism spectrum disorder (ASD) identification among identified children, median age at ASD identification including unidentified children, and cumulative incidence of ASD identified by age 48 months per 1,000 children for children with and without co-occurring intellectual disability (ID) by year in the ADDM Network

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status.

ID case status	Year	White			Black						Hispanic											
		Median among identified	Median including unidentified	Cumulative incidence	Median among identified	B to W diff	p	Median including unidentified	B to W diff	p	Cumulative incidence	B to W diff	B to W ratio	Median among identified	H to W diff	p	Median including unidentified	H to W diff	p	Cumulative incidence	H to W diff	H to W ratio
Without ID	2002	63 (60-66)	85 (81-88)	0.8 (0.7 - 1.0)	62 (54-70)	-1	0.93	92 (79-103)	7	0.18	0.5 (0.3 - 0.7)	-0.3 (-0.6 - -0.1)	0.6 (0.4 - 0.9)	62 (48-68)	-1	0.91	90 (72-NA)	5	0.46	0.4 (0.2 - 0.7)	-0.4 (-0.7 - -0.1)	0.5 (0.3 - 0.9)
Without ID	2004	66 (59-70)	80 (76-87)	1.1 (0.9 - 1.4)	71 (65-75)	5	0.36	82 (75-95)	2	0.8	0.4 (0.3 - 0.7)	-0.7 (-1.1 - -0.4)	0.4 (0.2 - 0.6)	68.5 (63-82)	2.5	0.83	95 (80-NA)	15	0.06	0.3 (0.1 - 0.7)	-0.8 (-1.2 - -0.3)	0.3 (0.1 - 0.7)
Without ID	2006	64 (62-68)	79 (76-82)	1.2 (1.0 - 1.4)	66 (57-75)	2	0.74	88 (81-94)	9	0.03	0.7 (0.5 - 0.9)	-0.5 (-0.8 - -0.2)	0.6 (0.4 - 0.8)	63 (58-72)	-1	0.82	88.5 (80-NA)	9.5	0.05	0.3 (0.1 - 0.5)	-0.9 (-1.2 - -0.6)	0.2 (0.1 - 0.4)
Without ID	2008	62 (60-64)	77 (73-79)	2.7 (2.4 - 3.1)	68 (64-72)	6	0.03	82 (76-86)	5	0.16	0.9 (0.7 - 1.2)	-1.8 (-2.3 - -1.3)	0.3 (0.2 - 0.5)	65 (58-71)	3	0.39	83 (79-93)	6	0.12	0.7 (0.4 - 1.0)	-2.0 (-2.5 - -1.6)	0.2 (0.2 - 0.4)
Without ID	2010	60 (58-62)	71 (69-73)	3.2 (2.9 - 3.6)	64 (60-68)	4	0.11	81 (76-86)	10	0	1.3 (1.0 - 1.6)	-1.9 (-2.4 - -1.5)	0.4 (0.3 - 0.5)	62 (59-66)	2	0.54	75 (70-81)	4	0.19	1.4 (1.1 - 1.8)	-1.8 (-2.2 - -1.3)	0.4 (0.3 - 0.6)
Without ID	2012	57 (54-60)	70 (67-72)	3.3 (3.0 - 3.6)	60.5 (57-64)	3.5	0.22	74 (68-78)	4	0.19	1.6 (1.3 - 1.9)	-1.7 (-2.2 - -1.3)	0.5 (0.4 - 0.6)	59 (56-61)	2	0.6	71 (66-81)	1	0.83	1.4 (1.2 - 1.8)	-1.9 (-2.3 - -1.4)	0.4 (0.3 - 0.5)
Without ID	2014	60 (59-63)	71 (69-74)	3.0 (2.7 - 3.3)	62 (60-65)	2	0.36	73 (69-75)	2	0.57	1.9 (1.6 - 2.3)	-1.1 (-1.6 - -0.6)	0.6 (0.5 - 0.8)	56 (53-61)	-4	0.08	74 (68-79)	3	0.31	2.1 (1.7 - 2.5)	-0.9 (-1.4 - -0.4)	0.7 (0.6 - 0.8)
Without ID	2016	60 (58-62)	67 (65-69)	3.3 (3.0 - 3.6)	60 (57-64)	0	1	69 (66-73)	2	0.45	2.1 (1.8 - 2.6)	-1.1 (-1.6 - -0.6)	0.7 (0.5 - 0.8)	59 (56-62)	-1	0.86	66 (62-71)	-1	0.79	2.2 (1.8 - 2.6)	-1.1 (-1.6 - -0.6)	0.7 (0.5 - 0.8)
With ID	2002	50 (48-53)	61 (57-67)	0.9 (0.7 - 1.0)	60 (56-64)	10	0	72 (65-77)	11	0.01	1.0 (0.8 - 1.3)	0.1 (-0.2 - 0.5)	1.2 (0.8 - 1.6)	59 (47-64)	9	0.06	75.5 (64-102)	14.5	0.04	0.5 (0.3 - 0.8)	-0.4 (-0.6 - 0.0)	0.6 (0.3 - 1.0)
With ID	2004	48 (43-57)	63.5 (57-72)	0.9 (0.7 - 1.2)	56 (50-63)	8	0.12	66 (60-73)	2.5	0.72	1.3 (1.0 - 1.7)	0.3 (-0.1 - 0.8)	1.4 (0.9 - 2.0)	58.5 (48-78)	10.5	0.23	95 (75-NA)	31.5	0.01	0.5 (0.2 - 1.0)	-0.4 (-0.8 - 0.1)	0.5 (0.2 - 1.2)
With ID	2006	45 (40-48)	57 (50-62)	1.2 (1.0 - 1.5)	50 (47-55)	5	0.04	60 (55-65)	3	0.57	1.5 (1.2 - 1.9)	0.3 (-0.1 - 0.8)	1.2 (0.9 - 1.7)	51 (44-58)	6	0.18	62.5 (57-70)	5.5	0.23	0.6 (0.3 - 0.9)	-0.7 (-1.0 - -0.3)	0.4 (0.3 - 0.7)
With ID	2008	42 (39-46)	51 (46-58)	1.9 (1.6 - 2.2)	53 (49-56)	11	0	63.5 (59-70)	12.5	0	2.2 (1.8 - 2.7)	0.3 (-0.2 - 0.9)	1.2 (0.9 - 1.5)	52 (46-58)	10	0	65 (58-79)	14	0	0.7 (0.5 - 1.1)	-1.2 (-1.6 - -0.7)	0.4 (0.2 - 0.6)
With ID	2010	44 (41-47)	50 (47-54)	1.9 (1.7 - 2.2)	46 (43-51)	2	0.5	55 (50-60)	5	0.16	2.6 (2.2 - 3.1)	0.7 (0.2 - 1.2)	1.4 (1.1 - 1.7)	53 (49-59)	9	0	61 (58-65)	11	0	1.4 (1.1 - 1.8)	-0.5 (-0.9 - -0.1)	0.7 (0.6 - 1.0)
With ID	2012	45 (42-48)	51 (48-55)	1.4 (1.2 - 1.7)	48 (46-52)	3	0.21	54 (51-57)	3	0.41	2.5 (2.1 - 2.9)	1.0 (0.6 - 1.5)	1.7 (1.4 - 2.1)	53 (47-58)	8	0.01	61 (55-66)	10	0	1.0 (0.7 - 1.2)	-0.5 (-0.8 - -0.1)	0.7 (0.5 - 0.9)
With ID	2014	45 (42-49)	50 (45-54)	1.4 (1.2 - 1.7)	48 (46-53)	3	0.29	54.5 (50-58)	4.5	0.17	2.6 (2.2 - 3.1)	1.2 (0.7 - 1.7)	1.8 (1.5 - 2.2)	47 (43-55)	2	0.44	56 (52-62)	6	0.1	1.7 (1.4 - 2.1)	0.3 (-0.1 - 0.7)	1.2 (0.9 - 1.5)
With ID	2016	43 (41-47)	48 (44-50)	2.1 (1.9 - 2.4)	47 (43-51)	4	0.17	51 (48-56)	3	0.18	3.3 (2.8 - 3.8)	1.2 (0.6 - 1.7)	1.5 (1.3 - 1.9)	45 (41-51)	2	0.54	51 (45-55)	3	0.24	2.0 (1.7 - 2.4)	-0.1 (-0.5 - 0.4)	0.9 (0.8 - 1.2)

Highlighted P values, risk differences, and risk ratios are significant.

Ages are represented in months.

NA = Not applicable (upper limit of 95% confidence interval could not be calculated because it extends into censored values).

Figure S7

Cumulative incidence of autism spectrum disorder (ASD) identification per 1,000 children at each month of age by race/ethnicity and co-occurring intellectual disability by site in 2016 in the ADDM Network

The line indicates cumulative incidence of ASD identified by age 48 months per 1,000 children.

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status.

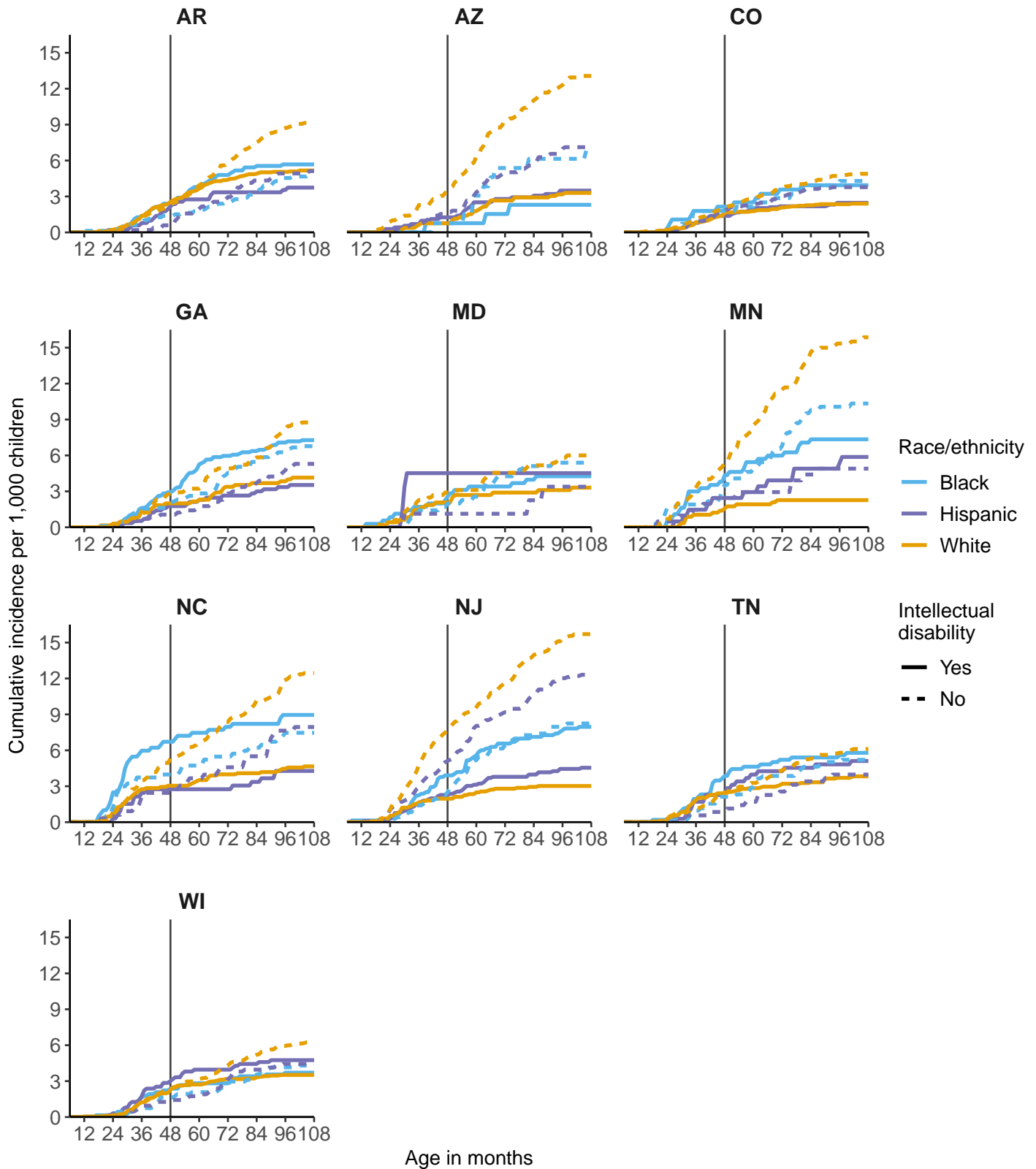


Table S9

Differences between Black or Hispanic children and White children in cumulative incidence of ASD identified by age 48 months per 1,000 children for children with and without co-occurring intellectual disability (ID) by site in 2016 in the ADDM Network

Note: Limited to sites with IQ data in ADDM surveillance reports; excludes children with unknown ID case status.

ID case status	Site	Year	White		Black		Hispanic		
			Cumulative incidence	Cumulative incidence	B to W diff	B to W ratio	Cumulative incidence	H to W diff	H to W ratio
With ID	AR	2016	2.5 (2.0 - 3.2)	2.5 (1.6 - 3.9)	0.0 (-1.2 - 1.4)	1.0 (0.6 - 1.6)	2.2 (1.2 - 3.9)	-0.4 (-1.6 - 1.4)	0.9 (0.5 - 1.6)
With ID	AZ	2016	0.8 (0.3 - 1.7)	0.8 (0.0 - 4.3)	0.0 (-1.1 - 3.6)	1.0 (0.2 - 6.4)	1.3 (0.7 - 2.4)	0.5 (-0.6 - 1.7)	1.6 (0.6 - 4.4)
With ID	CO	2016	1.6 (1.2 - 2.3)	2.1 (1.0 - 4.7)	0.5 (-0.8 - 3.1)	1.3 (0.6 - 3.0)	1.4 (0.9 - 2.2)	-0.3 (-1.1 - 0.6)	0.8 (0.5 - 1.5)
With ID	GA	2016	2.0 (1.2 - 3.4)	2.9 (2.0 - 4.2)	0.9 (-0.7 - 2.5)	1.5 (0.8 - 2.8)	1.8 (1.0 - 3.2)	-0.2 (-1.9 - 1.5)	0.9 (0.4 - 2.0)
With ID	MD	2016	2.1 (1.1 - 3.8)	2.6 (1.3 - 4.8)	0.5 (-1.6 - 3.0)	1.2 (0.5 - 3.0)	4.5 (1.8 - 11.6)	2.4 (-0.8 - 9.6)	2.2 (0.7 - 6.6)
With ID	MN	2016	1.6 (0.8 - 3.0)	4.4 (2.7 - 7.1)	2.8 (0.6 - 5.6)	2.8 (1.3 - 6.1)	2.4 (1.0 - 5.7)	0.9 (-1.1 - 4.2)	1.6 (0.5 - 4.4)
With ID	NC	2016	3.0 (2.2 - 4.3)	6.7 (4.6 - 9.8)	3.7 (1.2 - 6.8)	2.2 (1.3 - 3.7)	2.8 (1.4 - 5.2)	-0.3 (-2.1 - 2.3)	0.9 (0.4 - 1.9)
With ID	NJ	2016	2.0 (1.3 - 2.9)	3.9 (2.7 - 5.6)	1.9 (0.4 - 3.8)	2.0 (1.2 - 3.4)	2.3 (1.5 - 3.4)	0.3 (-0.9 - 1.6)	1.2 (0.7 - 2.0)
With ID	TN	2016	2.5 (1.8 - 3.4)	3.9 (2.5 - 6.0)	1.4 (-0.2 - 3.6)	1.6 (0.9 - 2.7)	2.3 (1.2 - 4.5)	-0.2 (-1.7 - 2.1)	0.9 (0.4 - 1.9)
With ID	WI	2016	2.3 (1.7 - 3.0)	2.4 (1.5 - 3.9)	0.1 (-1.1 - 1.7)	1.0 (0.6 - 1.8)	3.0 (1.9 - 4.7)	0.7 (-0.6 - 2.5)	1.3 (0.8 - 2.2)
Without ID	AR	2016	2.2 (1.7 - 2.9)	1.4 (0.8 - 2.5)	-0.8 (-1.8 - 0.3)	0.6 (0.3 - 1.2)	0.6 (0.2 - 1.7)	-1.6 (-2.4 - -0.4)	0.3 (0.1 - 0.8)
Without ID	AZ	2016	3.4 (2.4 - 5.0)	0.8 (0.0 - 4.3)	-2.7 (-4.4 - 1.0)	0.2 (0.0 - 1.3)	1.7 (1.0 - 2.9)	-1.8 (-3.5 - -0.1)	0.5 (0.3 - 1.0)
Without ID	CO	2016	2.0 (1.5 - 2.7)	1.8 (0.8 - 4.2)	-0.2 (-1.5 - 2.2)	0.9 (0.4 - 2.2)	1.9 (1.3 - 2.8)	-0.1 (-1.0 - 0.9)	0.9 (0.6 - 1.5)
Without ID	GA	2016	2.8 (1.7 - 4.4)	1.9 (1.2 - 3.0)	-0.8 (-2.6 - 0.6)	0.7 (0.4 - 1.3)	1.1 (0.5 - 2.3)	-1.7 (-3.4 - -0.1)	0.4 (0.2 - 0.9)
Without ID	MD	2016	2.9 (1.7 - 4.9)	2.0 (1.0 - 4.1)	-0.9 (-3.1 - 1.5)	0.7 (0.3 - 1.6)	1.1 (0.1 - 6.4)	-1.8 (-4.0 - 3.5)	0.4 (0.1 - 2.3)
Without ID	MN	2016	5.4 (3.8 - 7.7)	3.5 (2.1 - 6.0)	-1.9 (-4.6 - 1.1)	0.7 (0.3 - 1.2)	2.4 (1.0 - 5.7)	-3.0 (-5.7 - 0.6)	0.5 (0.2 - 1.1)
Without ID	NC	2016	5.3 (4.1 - 6.9)	4.0 (2.5 - 6.5)	-1.3 (-3.6 - 1.4)	0.7 (0.4 - 1.3)	2.4 (1.2 - 4.8)	-2.9 (-4.9 - -0.3)	0.5 (0.2 - 0.9)
Without ID	NJ	2016	7.7 (6.3 - 9.3)	2.5 (1.6 - 4.0)	-5.2 (-7.1 - -3.2)	0.3 (0.2 - 0.5)	5.1 (3.9 - 6.7)	-2.6 (-4.6 - -0.5)	0.7 (0.5 - 0.9)
Without ID	TN	2016	2.4 (1.8 - 3.3)	2.1 (1.2 - 3.8)	-0.3 (-1.6 - 1.5)	0.9 (0.5 - 1.7)	0.9 (0.3 - 2.5)	-1.6 (-2.6 - 0.2)	0.4 (0.1 - 1.1)
Without ID	WI	2016	2.4 (1.8 - 3.1)	1.6 (0.9 - 2.9)	-0.7 (-1.8 - 0.7)	0.7 (0.4 - 1.3)	1.4 (0.8 - 2.7)	-1.0 (-2.0 - 0.4)	0.6 (0.3 - 1.2)

Highlighted P values, risk differences, and risk ratios are significant.

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