

Sample Selection for MMR/Autism Study

~~2/27~~ 2/27 / 2022

Selection Criteria	Controls			Cases		
	Remaining Sample	Removed	Percent	Remaining Sample	Removed	Percent
Initial Sample	1912	NA	NA	647	NA	NA
Removed Extra Controls	1891	21	1%	647	0	0%
Missing Age Data	1890	1	0%	647	0	0%
Missing MMR Vaccine Date (1,2)	1876	14	1%	629	18	3%

1) 11 controls were missing their entire vaccination record

2) 14 cases were missing their entire vaccination record

Table 1: Preliminary Descriptive Statistics For Entire Sample *

	Category	Controls		Cases	
		N	Percent	N	Percent
Age 1996	3 - 5 yrs	635	34%	215	34%
	6 - 8 yrs	973	52%	321	51%
	9 - 10 yrs	268	14%	93	15%
	Total	1876	100%	629	100%
Sex	Male	1506	80%	505	80%
	Female	370	20%	124	20%
	Total	1876	100%	629	100%
Race	White	930	52%	336	55%
	Black	674	38%	232	38%
	Other	175	10%	40	7%
	Total	1779	100%	608	100%
Co-Existing DD	CP	NA	NA	31	5%
	MR	NA	NA	378	60%
	VI	NA	NA	8	1%
	HI	NA	NA	7	1%
	Epilepsy	NA	NA	49	8%
	Non-Isolated Autism	NA	NA	400	64%
Pre-existing Condition	Yes	NA	NA	79	13%
Delay < 1	Yes	NA	NA	186	30%
Pre-existing Condition or Delay < 1	Yes	NA	NA	222	35%
Median Age of 1st Concern	Months			18.1	
Age of MMR	0 - 11 mo	37	2.0%	8	1.3%
	12 - 15 mo	886	47.2%	335	53.3%
	16 - 18 mo	459	24.5%	144	22.9%
	19 - 23 mo	184	9.8%	57	9.1%
	24 - 35 mo	131	7.0%	45	7.2%
	36+ mo	179	9.5%	40	6.4%
	Total	1876	100.0%	629	100.0%

* All subjects reported in table had date of receipt of MMR vaccine

* All cases are confirmed cases

Table 2: Preliminary Descriptive Statistics for Birth Certificate Variables

Variable	Category	Controls		Cases	
		N	Percent	N	Percent
Age in 1996	3 - 5 yrs	382	36%	127	35%
	6 - 8 yrs	552	53%	182	51%
	9 - 10 yrs	115	11%	50	14%
	Total	1049	100%	359	100%
Sex	Male	834	80%	286	80%
	Female	215	20%	73	20%
	Total	1049	100%	359	100%
Race	White	578	55%	201	56%
	Black	405	39%	139	39%
	Other	66	6%	19	5%
	Total	1049	100%	359	100%
Mothers Age	< 20 yrs	102	10%	16	4%
	20 - 34 yrs	823	78%	282	79%
	35+ yrs	124	12%	61	17%
	Total	1049	100%	359	100%
Maternal Race	White	618	59%	209	58%
	Black	399	38%	138	38%
	Other	30	3%	12	3%
	Total	1047	100%	359	100%
Maternal Educ	<= 12 yrs	485	46%	138	38%
	13 - 15 yrs	259	25%	100	28%
	16+ yrs	305	29%	121	34%
	Total	1049	100%	359	100%
Birth Weight	0 - 1499 gms	11	1%	12	3%
	1500 - 2499 gms	55	5%	37	10%
	2500 + gms	983	94%	310	86%
	Total	1049	100%	359	100%
Multiplicity	Singleton	1017	97%	333	93%
	Twin +	32	3%	26	7%
	Total	1049	100%	359	100%
Parity	1st Born	462	44%	151	42%
	2nd or Higher	578	56%	206	58%
	Total	1040	100%	357	100%

* All subjects reported in table had date of receipt of MMR vaccine

* All cases are confirmed cases

Table 3: Associations Between Age of MMR Vaccination and Autism - Total Sample

Sample	Cases Variable	Univariate			Full Model			
		OR	L95CI	U95CI	OR	L95CI	U95CI	
Total	596	MMR < 18	1.14	0.92	1.40	1.11	0.89	1.38
		MMR < 36	1.61	1.10	2.34	1.58	1.08	2.33
		MMR Categories						
		0 - 11 mo	1.16	0.51	2.65	1.23	0.54	2.80
		12 - 15 mo	1.74	1.18	2.56	1.70	1.14	2.53
		16 - 18 mo	1.42	0.94	2.15	1.41	0.93	2.15
		19 - 23 mo	1.55	0.96	2.49	1.56	0.96	2.53
		24 - 35 mo	1.61	0.97	2.68	1.61	0.96	2.71
		36+ mo	1.00	1.00	1.00	1.00	1.00	1.00
Isolated	222	MMR < 18	1.12	0.78	1.61	1.04	0.72	1.50
		MMR < 36	2.48	1.16	5.31	2.20	1.00	4.85
		MMR Categories						
		0 - 11 mo	1.01	0.19	5.43	0.92	0.17	5.06
		12 - 15 mo	2.61	1.20	5.64	2.31	1.04	5.13
		16 - 18 mo	2.34	1.05	5.25	2.06	0.89	4.76
		19 - 23 mo	2.13	0.85	5.35	2.03	0.79	5.23
		24 - 35 mo	3.09	1.20	7.99	2.92	1.09	7.81
		36+ mo	1.00	1.00	1.00	1.00	1.00	1.00
Non-Isolated	374	MMR < 18	1.14	0.87	1.49	1.16	0.88	1.53
		MMR < 36	1.35	0.87	2.09	1.41	0.90	2.20
		MMR Categories						
		0 - 11 mo	1.25	0.48	3.24	1.37	0.53	3.57
		12 - 15 mo	1.49	0.95	2.35	1.55	0.97	2.48
		16 - 18 mo	1.16	0.71	1.89	1.22	0.74	2.01
		19 - 23 mo	1.39	0.80	2.44	1.46	0.83	2.59
		24 - 35 mo	1.20	0.64	2.23	1.16	0.61	2.19
		36+ mo	1.00	1.00	1.00	1.00	1.00	1.00

Table 4: Descriptive Race Data

Sample	Variable	N	Cases	Percent
Total	Cases	2583	596	23%
	Race - Black	2523	1005	40%
	Vac < 36 Months	2628	2395	91%

Race	Vac < 36 Months	N	Cases	Percent
White/Other	No	110	24	22%
White/Other	Yes	1383	333	24%
Black	No	106	14	13%
Black	Yes	883	224	25%

Sample	Variable	N	Cases	Percent
Birth Cert	Cases	1523	410	27%
	Race - Black	1523	616	40%
	Vac < 36 Months	1523	1421	93%

Race	Vac < 36 Months	N	Cases	Percent
White/Other	No	41	11	27%
White/Other	Yes	866	231	27%
Black	No	61	13	21%
Black	Yes	555	155	28%

Table 5: Race Interactions for Total Sample

Sample	Cases Variable	Matched Analyses						Unmatched Analyses						
		All Subjects			White Model			Black Model			Other Model			
		OR	L95CI	U95CI	OR	L95CI	U95CI	OR	L95CI	U95CI	OR	L95CI	U95CI	
Total	596	MMR < 18	1.14	0.92	1.40	0.96	0.71	1.29	1.23	0.91	1.67	1.41	0.63	3.13
		MMR < 36	1.61	1.10	2.34	0.89	0.52	1.52	2.25	1.25	4.03	1.97	0.64	6.09
		MMR Categories												
		0 - 11 mo	1.16	0.51	2.65	1.08	0.37	3.16	1.42	0.36	5.59	NA	NA	NA
		12 - 15 mo	1.74	1.18	2.56	0.99	0.58	1.70	2.17	1.18	4.00	2.33	0.72	7.57
		16 - 18 mo	1.42	0.94	2.15	0.69	0.39	1.24	2.68	1.43	5.05	1.71	0.46	6.35
		19 - 23 mo	1.55	0.96	2.49	0.83	0.41	1.67	2.02	1.00	4.10	3.00	0.63	14.17
		24 - 35 mo	1.61	0.97	2.68	0.96	0.45	2.08	2.03	0.99	4.14	1.11	0.11	11.43
		36+ mo	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Isolated	222	MMR < 18	1.12	0.78	1.61	1.01	0.67	1.52	1.35	0.77	2.36	NA	NA	NA
		MMR < 36	2.48	1.16	5.31	1.26	0.56	2.84	3.85	0.92	16.09	NA	NA	NA
		MMR Categories												
		0 - 11 mo	1.01	0.19	5.43	0.51	0.06	4.46	3.30	0.28	39.16	NA	NA	NA
		12 - 15 mo	2.61	1.20	5.64	1.31	0.58	2.98	4.12	0.96	17.65	NA	NA	NA
		16 - 18 mo	2.34	1.05	5.25	1.20	0.51	2.83	3.86	0.86	17.41	NA	NA	NA
		19 - 23 mo	2.13	0.85	5.35	0.86	0.29	2.53	4.15	0.87	19.83	NA	NA	NA
		24 - 35 mo	3.09	1.20	7.99	1.99	0.71	5.59	2.68	0.51	14.23	NA	NA	NA
		36+ mo	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Non-Isolated	374	MMR < 18	1.14	0.87	1.49	0.91	0.62	1.35	1.21	0.86	1.69	NA	NA	NA
		MMR < 36	1.35	0.87	2.09	0.70	0.37	1.31	1.99	1.06	3.73	NA	NA	NA
		MMR Categories												
		0 - 11 mo	1.25	0.48	3.24	1.43	0.44	4.66	1.12	0.23	5.55	NA	NA	NA
		12 - 15 mo	1.49	0.95	2.35	0.82	0.43	1.57	1.85	0.96	3.58	NA	NA	NA
		16 - 18 mo	1.16	0.71	1.89	0.42	0.20	0.86	2.51	1.28	4.95	NA	NA	NA
		19 - 23 mo	1.39	0.80	2.44	0.81	0.35	1.86	1.66	0.76	3.64	NA	NA	NA
		24 - 35 mo	1.20	0.64	2.23	0.45	0.15	1.38	1.91	0.89	4.13	NA	NA	NA
		36+ mo	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 6: Associations Between Age of MMR Vaccination and Autism - Birth Certificate Sample

Sample	Cases	Variable	OR		Univariate		Full Model		Reduced Model		
			OR	U95CI	L95CI	OR	L95CI	OR	L95CI	OR	U95CI
Birth Cert Matched	410	MMR < 18	0.95	1.30	0.70	1.24	0.67	1.25	0.68	2.30	
			1.37	2.48	0.76	1.24	0.67	1.25	0.68	2.30	
	MMR < 36	MMR Categories	0.89	3.77	0.21	1.24	0.67	1.25	0.68	2.30	
			1.42	2.60	0.77	1.24	0.67	1.25	0.68	2.30	
			1.21	2.29	0.64	1.24	0.67	1.25	0.68	2.30	
			1.42	2.86	0.70	1.24	0.67	1.25	0.68	2.30	
			1.61	3.51	0.74	1.24	0.67	1.25	0.68	2.30	
			1.00	1.00	1.00	1.24	0.67	1.25	0.68	2.30	
	Birth Cert Unmatched	410	MMR < 18	0.94	1.21	0.73	1.17	0.72	1.20	0.74	1.94
				1.23	1.98	0.77	1.17	0.72	1.20	0.74	1.94
MMR < 36		MMR Categories	1.02	3.44	0.30	1.17	0.72	1.20	0.74	1.94	
			1.26	2.04	0.77	1.17	0.72	1.20	0.74	1.94	
			1.14	1.91	0.69	1.17	0.72	1.20	0.74	1.94	
			1.15	2.07	0.64	1.17	0.72	1.20	0.74	1.94	
			1.53	2.83	0.82	1.17	0.72	1.20	0.74	1.94	
			1.00	1.00	1.00	1.17	0.72	1.20	0.74	1.94	
Birth Cert Unmatched Blacks		168	MMR < 36	1.46	2.78	0.77	1.58	0.81	1.62	0.84	3.12
				1.46	2.78	0.77	1.58	0.81	1.62	0.84	3.12