

8/05/2002

### Sample Selection for MMR/Autism Study

Selection Criteria	Variables Definition	Cases		Controls	
		Yes	Total%	Yes	Total%
MADDSP Surveillance Cases		987	NA	NA	NA
MADDSP Cases Identified in School System	(CASE = 2)	706	NA	NA	NA
Confirmed Autism Cases	(AUCASEDF = 1)	660	NA	NA	NA
Available Controls		NA	NA	2143	NA
Controls with valid CASENUM	(CASENUM ne Missing)	NA	NA	2113	NA
Cases Matched with any Control		647	NA	1912	NA
Cases Matched with >= 1 Original Control		647	100%	1891	100%
Controls with Valid Age Data		NA	NA	1890	100%
Cases and Controls with Valid MMR Vaccine Date (1,2)		629	97%	1876	99%

1) 11 controls were missing their entire vaccination record

2) 14 cases were missing their entire vaccination record

Table 1: Descriptive Statistics For Entire Sample \*

Variable	Category	Controls		Cases	
		N	Percent	N	Percent
Age 1996	3 - 5 yrs	635	34%	215	34%
	6 - 10 yrs	1241	66%	414	66%
	Total	1876	100%	629	100%
Sex	Male	1506	80%	505	80%
	Female	370	20%	124	20%
	Total	1876	100%	629	100%
Race	White	930	50%	336	53%
	Black	674	36%	232	37%
	Other	175	9%	40	6%
	Missing	97	5%	21	3%
	Total	1876	100%	629	100%

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

\* All cases are confirmed cases

\* DSM IV published in 1994

6/10/2014

**Table 2: Descriptive Statistics for Matched Autism Cases**

<b>Associated Conditions</b>	<b>Yes</b>	<b>%</b>	<b>No</b>	<b>%</b>	<b>Total</b>
<b>Low Functioning (MR)</b>	<b>378</b>	<b>60%</b>	<b>251</b>	<b>40%</b>	<b>629</b>
<b>Low Functioning (MR) DX &lt;= 1 Year</b>	<b>10</b>	<b>2%</b>	<b>619</b>	<b>98%</b>	<b>629</b>
<b>Cerebral Palsy DX &lt;= 1 Year</b>	<b>7</b>	<b>1%</b>	<b>622</b>	<b>99%</b>	<b>629</b>
<b>Visual Impairment DX &lt;= 1 Year</b>	<b>1</b>	<b>0%</b>	<b>628</b>	<b>100%</b>	<b>629</b>
<b>Hearing Impairment DX &lt;= 1 Year</b>	<b>3</b>	<b>0%</b>	<b>626</b>	<b>100%</b>	<b>629</b>
<b>Major Birth Defects</b>	<b>28</b>	<b>4%</b>	<b>601</b>	<b>96%</b>	<b>629</b>
<b>Other Pre-existing conditions &lt;= 1 Year *</b>	<b>212</b>	<b>34%</b>	<b>417</b>	<b>66%</b>	<b>629</b>
<b>Any Pre-Existing Conditions &lt;= 1 Year</b>	<b>235</b>	<b>37%</b>	<b>394</b>	<b>63%</b>	<b>629</b>
<b>Regression or Plateau</b>	<b>80</b>	<b>13%</b>	<b>549</b>	<b>87%</b>	<b>629</b>

\* These conditions were identified through chart review

Table 3: Descriptive Statistics Unmatched Birth Certificate Sample

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%
Maternal 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

\*\*\* Subjects in this table are unmatched (311 Cases with 576 Matched Controls)

Table 4: Age at 1st MMR Vaccination and Case Status

1) Total Sample	Age Group	Controls	%Controls	Cases	%Cases	OR	- 95% CI	+ 95% CI
	0 - 11 mo	37	2.0%	8	1.3%	1.0	0.4	2.3
	12 - 17 mo	1258	67.1%	444	70.6%	<b>1.6</b>	<b>1.1</b>	<b>2.2</b>
	18 - 23 mo	271	14.4%	92	14.6%	1.5	1.0	2.3
	24 - 29 mo	93	5.0%	29	4.6%	1.5	0.8	2.5
	30 - 35 mo	38	2.0%	16	2.5%	1.8	0.9	3.7
	36+ mo	179	9.5%	40	6.4%	--	--	--
<b>Total</b>		1876	100.0%	629	100.0%			

\* Overall test of distribution is not statistically significant

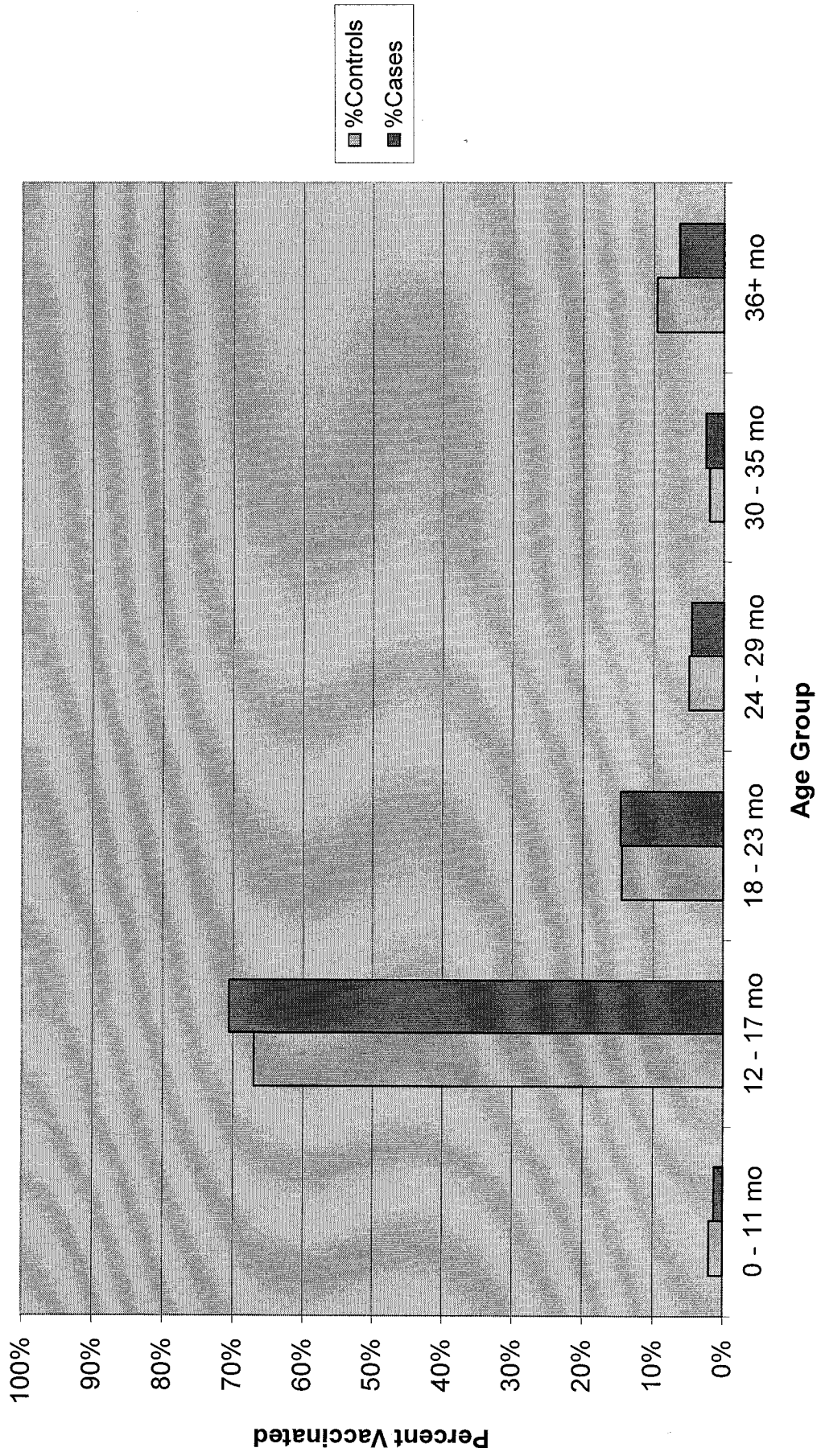
2) Unmatched BC Sample	Age Group	Controls	%Controls	Cases	%Cases	OR	- 95% CI	+ 95% CI
	0 - 11 mo	10	1.0%	2	0.6%	0.8	0.2	4.0
	12 - 17 mo	744	70.9%	251	69.9%	1.4	0.8	2.3
	18 - 23 mo	159	15.2%	59	16.4%	1.5	0.8	2.7
	24 - 29 mo	42	4.0%	16	4.5%	1.5	0.7	3.3
	30 - 35 mo	17	1.6%	12	3.3%	<b>2.9</b>	<b>1.2</b>	<b>7.0</b>
	36+ mo	77	7.3%	19	5.3%	--	--	--
<b>Total</b>		1049	100.0%	359	100.0%			

\* Overall test of distribution is not statistically significant

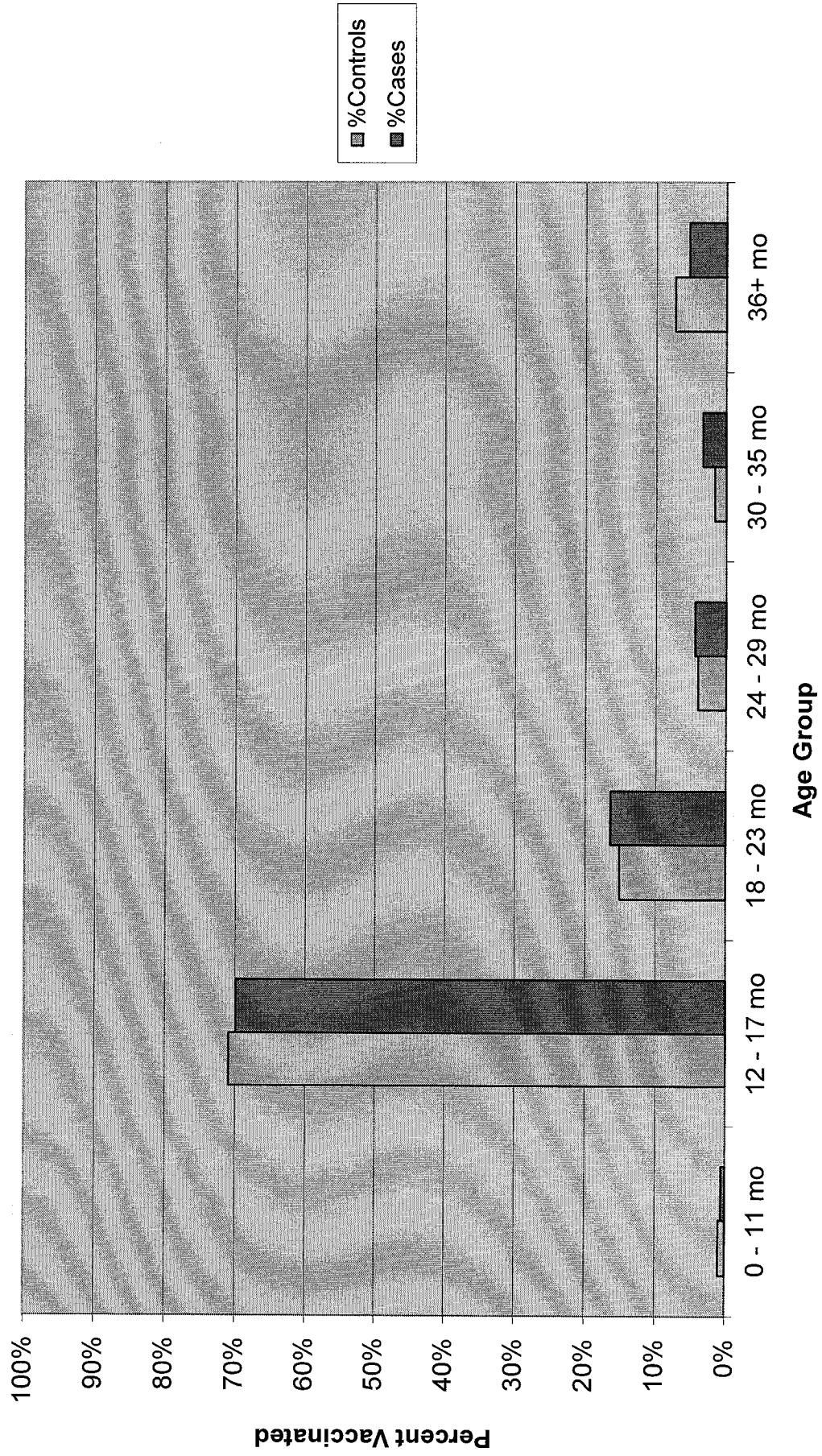
3) Matched BC Sample	Age Group	Controls	%Controls	Cases	%Cases	OR	- 95% CI	+ 95% CI
	0 - 11 mo	8	1.4%	2	0.6%	0.7	0.1	4.0
	12 - 17 mo	406	70.5%	219	70.4%	1.4	0.7	2.7
	18 - 23 mo	87	15.1%	52	16.7%	1.5	0.8	3.1
	24 - 29 mo	28	4.9%	13	4.2%	1.3	0.5	3.2
	30 - 35 mo	8	1.4%	9	2.9%	2.4	0.7	7.7
	36+ mo	39	6.8%	16	5.1%	--	--	--
<b>Total</b>		576	100.0%	311	100.0%			

\* Overall test of distribution is not statistically significant

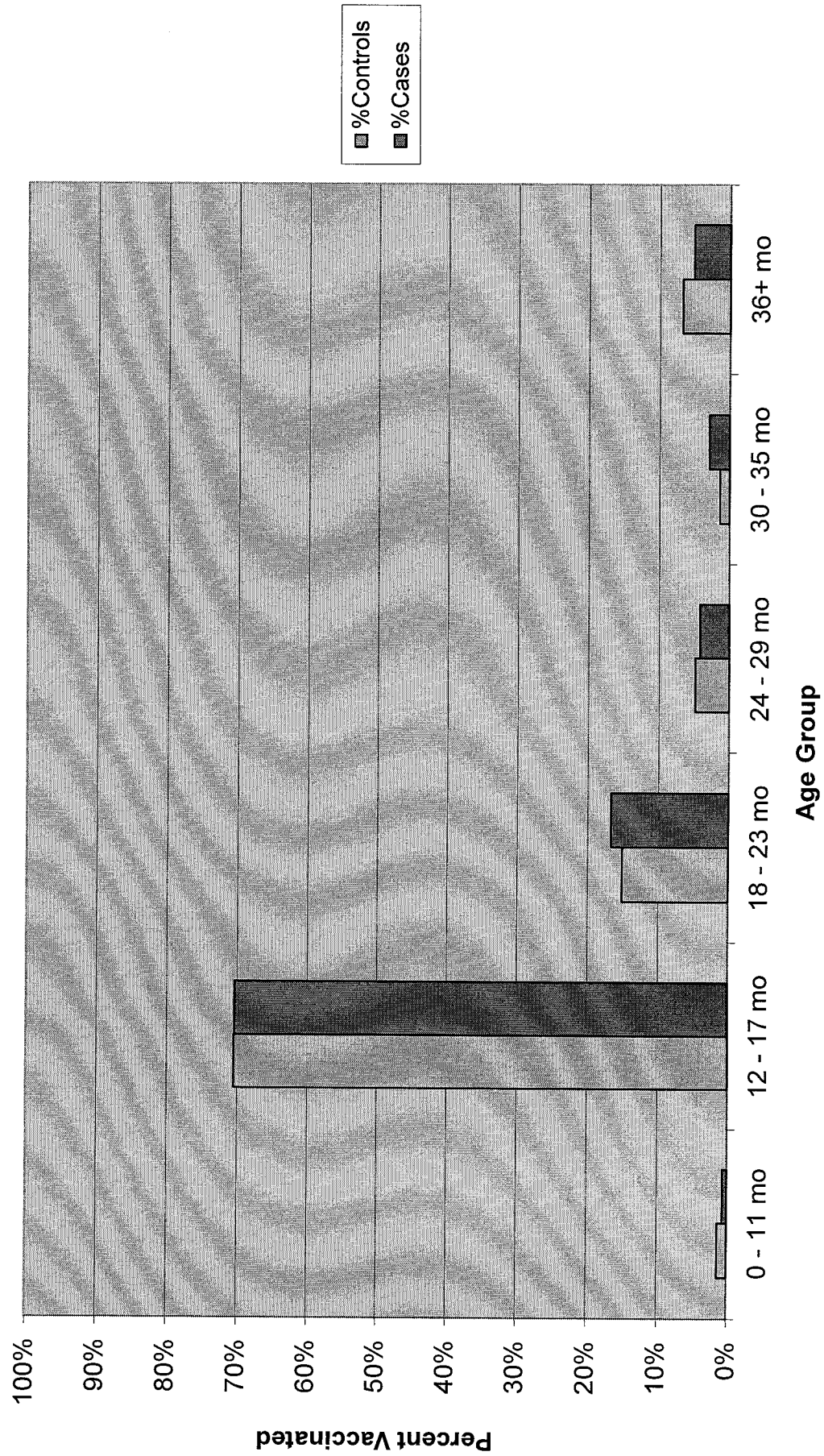
**Figure 1a: Age of 1st MMR Vaccination by Case Status For Total Sample**



**Figure 1b: Age of 1st MMR Vaccination by Case Status for Unmatched Birth Certificate Sample**



**Figure 1c: Age of 1st MMR Vaccination by Case Status for Matched Birth Certificate Sample**





**Table 5: Matched Statistical Analyses for Dichotomous Cut-Points**

Sample	Exposure	Cases	Crude OR			Adjusted OR		
			OR	L95CI	U95CI	OR	L95CI	U95CI
<b>Total</b>	<b>MMR &lt; 18 Mo</b>	<b>629</b>	<b>1.13</b>	<b>0.92</b>	<b>1.39</b>			
	<b>MMR &lt; 24 Mo</b>	<b>629</b>	<b>1.23</b>	<b>0.95</b>	<b>1.60</b>			
	<b>MMR &lt; 36 Mo</b>	<b>629</b>	<b>1.53</b>	<b>1.07</b>	<b>2.19</b>			
<b>Birth Certificate</b>	<b>MMR &lt; 18 Mo</b>	<b>311</b>	<b>1.00</b>	<b>0.72</b>	<b>1.38</b>	<b>0.95</b>	<b>0.67</b>	<b>1.33</b>
	<b>MMR &lt; 24 Mo</b>	<b>311</b>	<b>1.14</b>	<b>0.74</b>	<b>1.75</b>	<b>1.04</b>	<b>0.66</b>	<b>1.63</b>
	<b>MMR &lt; 36 Mo</b>	<b>311</b>	<b>1.45</b>	<b>0.76</b>	<b>2.76</b>	<b>1.30</b>	<b>0.67</b>	<b>2.55</b>

**Table 6a: Matched Case Subgroup Analyses for <18 Month Cut-Point**

Sample	Case Subgroup	Cases	Crude OR			Adjusted OR		
			OR	L95CI	U95CI	OR	L95CI	U95CI
<b>Total</b>	<b>All Cases</b>	<b>629</b>	1.13	0.92	1.39			
	<b>Males</b>	<b>505</b>	1.24	0.98	1.56			
	<b>Females</b>	<b>124</b>	0.82	0.52	1.30			
	<b>No Pre-Existing Conditions Before Age 1 Year</b>	<b>394</b>	1.08	0.83	1.40			
	<b>Regression or Plateau</b>	<b>80</b>	1.46	0.83	2.60			
	<b>Low Functioning (MR)</b>	<b>378</b>	1.06	0.82	1.38			
	<b>High Functioning (No MR)</b>	<b>251</b>	1.26	0.90	1.77			
	<b>Records in School Sources Only</b>	<b>258</b>	1.31	0.96	1.79			
	<b>Records from Multiple Sources and/or Clinics</b>	<b>371</b>	1.01	0.77	1.33			
	<b>Previous ASD Dx</b>	<b>396</b>	1.05	0.81	1.36			
	<b>No Previous ASD Dx</b>	<b>233</b>	1.29	0.92	1.83			
<b>Birth Certificate</b>	<b>All Cases</b>	<b>311</b>	1.00	0.72	1.38	0.95	0.67	1.33
	<b>Males</b>	<b>243</b>	1.03	0.71	1.48	0.98	0.67	1.44
	<b>Females</b>	<b>68</b>	0.92	0.45	1.90	0.77	0.32	1.82
	<b>No Pre-Existing Conditions Before Age 1 Year</b>	<b>187</b>	1.09	0.71	1.66	1.06	0.68	1.64
	<b>Regression or Plateau</b>	<b>31</b>	1.02	0.39	2.67	1.16	0.41	3.28
	<b>Low Functioning (MR)</b>	<b>179</b>	1.16	0.76	1.79	1.12	0.71	1.77
	<b>High Functioning (No MR)</b>	<b>132</b>	0.80	0.49	1.33	0.74	0.43	1.26
	<b>Records in School Sources Only</b>	<b>125</b>	1.18	0.71	1.97			
	<b>Records from Multiple Sources and/or Clinics</b>	<b>186</b>	0.89	0.58	1.35			
	<b>Previous ASD Dx</b>	<b>199</b>	1.00	0.67	1.48			
	<b>No Previous ASD Dx</b>	<b>112</b>	0.99	0.55	1.77			

**Table 6b: Matched Case Subgroup Analyses for <24 Month Cut-Point**

Sample	Case Subgroup	Cases			Crude OR			Adjusted OR				
		OR	L95CI	U95CI	OR	L95CI	U95CI	OR	L95CI	U95CI		
Total	All Cases	629	1.23	0.95	1.60							
	Males	505	1.31	0.98	1.77							
	Females	124	0.98	0.56	1.71							
	No Pre-Existing Conditions Before Age 1 Year	394	1.15	0.83	1.59							
	Regression or Plateau	80	1.45	0.69	3.04							
	Low Functioning (MR)	378	1.10	0.80	1.52							
	High Functioning (No MR)	251	1.52	0.97	2.39							
	Records in School Sources Only	258	1.34	0.92	1.96							
	Records from Multiple Sources and/or Clinics	371	1.14	0.80	1.63							
	Previous ASD Dx	396	1.11	0.80	1.53							
	No Previous ASD Dx	233	1.48	0.95	2.30							
	Birth Certificate	All Cases	311	1.00	0.72	1.38	0.95	0.67	1.33			
		Males	243	1.19	0.73	1.93	1.08	0.65	1.80			
		Females	68	0.96	0.37	2.47	0.80	0.24	2.68			
No Pre-Existing Conditions Before Age 1 Year		187	1.10	0.62	1.95	1.04	0.57	1.89				
Regression or Plateau		31	0.93	0.27	3.25	1.17	0.31	4.41				
Low Functioning (MR)		179	1.06	0.62	1.81	0.94	0.53	1.68				
High Functioning (No MR)		132	1.30	0.61	2.75	1.21	0.55	2.69				
Records in School Sources Only		125	0.95	0.52	1.73							
Records from Multiple Sources and/or Clinics		186	1.37	0.73	2.57							
Previous ASD Dx		199	1.25	0.72	2.16							
No Previous ASD Dx		112	0.97	0.47	1.97							

**Table 6c: Matched Case Subgroup Analyses for <36 Month Cut-Point**

Sample	Case Subgroup	Cases	Crude OR			Adjusted OR			
			OR	L95CI	U95CI	OR	L95CI	U95CI	
Total	All Cases	629	1.53	1.07	2.19				
	Males	505	1.72	1.13	2.60				
	Females	124	1.09	0.53	2.26				
	No Pre-Existing Conditions Before Age 1 Year	394	1.49	0.95	2.35				
	Regression or Plateau	80	1.83	0.62	5.45				
	Low Functioning (MR)	378	1.22	0.80	1.86				
	High Functioning (No MR)	251	2.60	1.27	5.32				
	Records in School Sources Only	258	2.82	1.51	5.25				
	Records from Multiple Sources and/or Clinics	371	1.00	0.64	1.57				
	Previous ASD Dx	396	1.27	0.82	1.94				
	No Previous ASD Dx	233	2.26	1.17	4.38				
	Birth Certificate	All Cases	311	1.45	0.76	2.76	1.30	0.67	2.55
		Males	243	2.04	0.95	4.40	1.84	0.84	4.04
		Females	68	0.40	0.09	1.70			
No Pre-Existing Conditions Before Age 1 Year		187	1.77	0.77	4.07				
Regression or Plateau		31	1.00	0.18	5.61				
Low Functioning (MR)		179	0.89	0.42	1.86				
High Functioning (No MR)		132	8.43	1.09	65.00	8.02	0.97	66.21	
Records in School Sources Only		125	1.83	0.71	4.76				
Records from Multiple Sources and/or Clinics		186	1.16	0.48	2.82				
Previous ASD Dx		199	1.19	0.54	2.61				
No Previous ASD Dx		112	2.11	0.67	6.64	1.85	0.55	6.22	

**Table 7a: Unmatched Subgroup Analyses for <18 Month Cut-Point**

Subgroups	Cases		Crude OR			Cases			Adjusted OR		
	OR	L95CI	U95CI	OR	L95CI	U95CI	OR	L95CI	U95CI		
All Cases	629	1.15	0.94	1.40							
White/Other	376	1.02	0.78	1.34							
Black	232	1.25	0.91	1.70							
Born in GA	399	1.05	0.81	1.35							
Not Born in GA	230	1.28	0.93	1.77							
Maternal Age 35+ Years	61	0.99	0.69	1.41	61	0.81	0.53	1.22			
Maternal Age < 35 Years	298	1.02	0.76	1.35	298	0.92	0.68	1.24			
Maternal Education 16+ Years	121	0.65	0.37	1.12	121	0.68	0.38	1.20			
Maternal Education <16 Years	238	0.98	0.721	1.33	238	0.92	0.67	1.26			
Birth Weight < 2500 gms	49	0.59	0.27	1.30	49	0.49	0.18	1.37			
Birth Weight >= 2500 gms	310	1.01	0.76	1.34	310	0.92	0.68	1.23			

**Table 7b: Unmatched Subgroup Analyses for <24 Month Cut-Point**

Subgroups	Cases		Crude OR			Cases			Adjusted OR			
	OR	L95CI	U95CI	OR	L95CI	U95CI	OR	L95CI	U95CI	OR	L95CI	U95CI
<b>Birth Weight &gt;= 2500 gms</b>	<b>310</b>	<b>1.01</b>	<b>0.76</b>	<b>1.34</b>	<b>310</b>	<b>0.92</b>	<b>0.68</b>	<b>1.23</b>				
<b>All Cases</b>	<b>629</b>	<b>1.27</b>	<b>0.98</b>	<b>1.64</b>								
<b>White/Other</b>	<b>376</b>	<b>1.08</b>	<b>0.75</b>	<b>1.55</b>								
<b>Black</b>	<b>232</b>	<b>1.51</b>	<b>1.02</b>	<b>2.24</b>	<b>139</b>	<b>0.93</b>	<b>0.56</b>	<b>1.53</b>				
<b>Born in GA</b>	<b>399</b>	<b>1.23</b>	<b>0.87</b>	<b>1.75</b>								
<b>Not Born in GA</b>	<b>230</b>	<b>1.24</b>	<b>0.85</b>	<b>1.83</b>								
<b>Maternal Age 35+ Years</b>	<b>61</b>	<b>0.57</b>	<b>0.17</b>	<b>1.95</b>	<b>61</b>	<b>0.57</b>	<b>0.16</b>	<b>2.04</b>				
<b>Maternal Age &lt; 35 Years</b>	<b>298</b>	<b>1.00</b>	<b>0.69</b>	<b>1.45</b>	<b>298</b>	<b>0.95</b>	<b>0.65</b>	<b>1.40</b>				
<b>Maternal Education 16+ Years</b>	<b>121</b>	<b>0.78</b>	<b>0.31</b>	<b>1.99</b>	<b>121</b>	<b>0.82</b>	<b>0.31</b>	<b>2.16</b>				
<b>Maternal Education &lt;16 Years</b>	<b>238</b>	<b>0.97</b>	<b>0.66</b>	<b>1.44</b>	<b>238</b>	<b>0.93</b>	<b>0.63</b>	<b>1.40</b>				
<b>Birth Weight &lt; 2500 gms</b>	<b>49</b>	<b>0.54</b>	<b>0.20</b>	<b>1.48</b>	<b>49</b>	<b>0.40</b>	<b>0.13</b>	<b>1.17</b>				
<b>Birth Weight &gt;= 2500 gms</b>	<b>310</b>	<b>1.11</b>	<b>0.75</b>	<b>1.63</b>	<b>310</b>	<b>0.97</b>	<b>0.65</b>	<b>1.45</b>				

**Table 7c: Unmatched Subgroup Analyses for <36 Month Cut-Point**

Subgroups	Cases		Crude OR			Cases			Adjusted OR				
	OR	L95CI	OR	L95CI	U95CI	Cases	OR	L95CI	U95CI	Cases	OR	L95CI	U95CI
All Cases	629	1.55	1.09	1.09	2.22	359	1.33	0.78	2.26				
White/Other	376	1.13	0.71	0.71	1.79								
Black	232	2.25	1.25	1.25	4.04	139	1.49	0.73	3.04				
Born in GA	399	1.57	0.95	0.95	2.59								
Not Born in GA	230	1.45	0.88	0.88	2.41								
Maternal Age 35+ Years	61					61							
Maternal Age < 35 Years	298					298							
Maternal Education 16+ Years	121					121							
Maternal Education <16 Years	238					238							
Birth Weight < 2500 gms	49					49							
Birth Weight >= 2500 gms	310					310							