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## Family Size and Risk of Juvenile Idiopathic Arthritis: A Cross-Sectional Study

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# FAMILY SIZE AND RISK OF JUVENILE IDIOPATHIC ARTHRITIS: A CROSS- SECTIONAL STUDY

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# Outline

- Background
- Purpose
- Methods
- Results
- Discussion
- Conclusion
- References



# Background

- Group of auto-immune conditions involving joint inflammation
- Appears before the age of 16
- Affects about 294,000 children in the U.S.
- Largely attributed to genetic factors
- Some environmental factors have been investigated
- Hygiene hypothesis has been used to explain environmental component
- Sibling exposure, common marker for microbe exposure



# Purpose

- Investigate the relationship between Total number of kids/Family size and JIA in the U.S.



# Methods

- Secondary analysis of 2016 National Survey for Child Health (NSCH)
- Requested for data on March 10<sup>th</sup>
- Granted access on March 12<sup>th</sup>
- Sample size: 50,212 children (aged 0-17 years)
- Descriptive statistics
- Bivariate analyses
- Multiple logistic regression: 2 models
- SAS version 9.4



# Methods-Variables

## Outcome

- Arthritis

## Predictors

- Total number of kids  
/Family size
- Someone smokes inside  
the household
- Born 3 weeks before due  
date

## Covariates

- Age
- Sex
- Race
- Poverty level
- Education level



**Results-Table 1: Bivariate Analysis**

Variables [n(%)]	Arthritis=Yes (N=153)	Arthritis=No (N=44988)	P value
Age			<0.0001
0-3 years	6 (0.07%)	8666 (99.93%)	
4-7 years	18 (0.21%)	8580 (99.79%)	
8-11 years	18 (0.19%)	9299 (99.81%)	
12-14 years	42 (0.51%)	8134 (99.49%)	
15-17 years	69 (0.67%)	10156 (99.33%)	
Sex			0.0075
Male	62 (0.27%)	23019 (99.73%)	
Female	91 (0.42%)	21816 (99.58%)	
Race			0.2804
Hispanic	12 (0.25%)	4698 (99.75%)	
Non-Hispanic White	114 (0.35%)	32215 (99.65%)	
Non-Hispanic Black	12 (0.52%)	2301 (99.48%)	
Non-Hispanic Asian	4 (0.18%)	2225 (99.82%)	
Non-Hispanic Multi racial	11 (0.32%)	3396 (99.68%)	
Highest education level			<0.0001
Less than High school	2 (0.23%)	868 (99.77%)	
High school/GED	32 (0.61%)	5252 (99.77%)	
Some college/technical school	46 (0.46%)	9975 (99.54%)	
College degree/Higher	73 (0.25%)	28740 (99.75%)	





Variables [n(%)]	Arthritis=Yes (N=153)	Arthritis=No (N=44988)	P value
Poverty level			<0.0001
0-99% FPL	27 (0.73%)	3656 (99.27%)	
100%-199% FPL	30 (0.44%)	6764 (99.56%)	
200%-399% FPL	46 (0.33%)	14094 (99.67)	
400% FPL or above	50 (0.25%)	20321 (99.75%)	
Family size			<0.0001
1	1 (5.26%)	18 (94.74%)	
2	23 (0.95%)	2402 (99.05%)	
3	43 (0.30%)	14398 (99.70%)	
4	50 (0.29%)	17198 (99.71%)	
5	25 (0.34%)	7340 (16.37)	
6	8 (0.29%)	2779 (99.71%)	
7	1 (0.21%)	483 (99.79%)	
8 or more	2 (0.91%)	217 (99.09%)	
Total no of kids			0.3276
1	74 (0.40%)	18602 (99.60%)	
2	52 (0.29%)	17824 (99.71%)	
3	18 (0.30%)	6041 (99.70%)	
4	9 (0.38%)	2368 (99.62%)	



Variables [n(%)]	Arthritis=Yes (N=153)	Arthritis=No (N=44988)	P value
Someone smokes inside the home			<0.0001
No one	116 (0.30%)	38472 (99.70%)	
Someone smokes, not inside	28 (0.50%)	5523 (99.50%)	
Someone smokes inside the house	9 (1.06%)	840 (98.94%)	
Born 3 weeks before due date			0.0135
Yes	26 (0.53%)	4834 (99.47%)	
No	127 (0.32%)	40001 (99.68%)	



*Table 2: Multiple Logistic Regression (Model 1)*

Variables	OR Estimate (CI)	P value
Family size 2 vs 1	0.156 (0.019, 1.248)	0.0799
3 vs 1	0.072 (0.009,0.564)	0.0122
4 vs 1	0.075 (0.010,0.590)	0.0138
5 vs 1	0.083 (0.010,0.660)	0.0187
6 vs 1	0.066 (0.008,0.568)	0.0133
7 vs 1	0.039 (0.002,0.661)	0.0246
8 or more vs 1	0.186 (0.016,2.206)	0.1824
Someone smokes, not inside vs no one smokes	1.379 (0.897,2.119)	0.1432
Someone smokes inside the house vs no one smokes	1.946 (0.957,3.956)	0.0658
Born 3 weeks before due date Yes vs No	1.615 (1.056,2.471)	0.0271
Sex (Female vs Male)	1.547 (1.118,2.139)	0.0084
Race		0.5013*
Highest Education Level		0.3133*
Poverty level		0.0106*



*Table 3- Model 2*

Variables	OR Estimate (CI)	P value
Total no of kids (2 vs 1)	0.934 (0.648,1.345)	0.7127
3 vs 1	0.912 (0.537,1.549)	0.7336
4 vs 1	1.035 (0.509,2.106)	0.9234
Someone smokes, not inside vs no one smokes	1.342 (0.874,2.062)	0.1793
Someone smokes inside the house vs no <u>one smokes</u>	1.878 (0.924,3.819)	0.0817
Born 3 weeks before due date <u>Yes</u> vs No	1.625 (1.063,2.485)	0.0251
Sex (Female vs Male)	1.557 (1.126,2.152)	0.0074
Age		<0.0001*
Race		0.4927*
Highest Education Level		0.2956*
Poverty level		0.0037*

\*Type 3 analysis of effects



# Discussion

- Larger families less likely to experience JIA
- Total number of kids not significantly associated with JIA
- Belies an Australian study
- Why was this the case?
- Total number of kids and family size were significantly associated



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# Conclusion

- Hygiene hypothesis appears to be better explained by family size in the U.S.
- Further studies needed to understand JIA risk factors in the U.S.



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