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Andrew J. Berman

Wright State University - Main Campus, berman.7@wright.edu

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Family Structure and Pediatric Outcomes in Ohio

Berman, Andrew J

Amber Todd Medical Education

Population and Public Health

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Abstract

Objective: The number of single-parent households has been trending upwards since the early 1900s. Studies in the past have evaluated the effects single-parent households have on pediatric outcomes nationwide. This study attempts to build upon these past studies by analyzing whether these findings remain when looked at the State level, for Ohio 2020, as well as see if the percent of children in single-parent households can predict child mortality.

Methods: Data was collected from publicly available data sets through County Health Rankings. This study utilizes SPSS for data analysis. ANOVA with post-hoc was performed to compare children in single-parent household percentages across the Midwest for 2020. A paired t-test was performed to compare children in single-parent household percentages from Ohio 2016 to Ohio 2020. Two correlations were performed to view any correlation between the percentage of children in single-parent households and teenage birth rate for Ohio 2020, and between the percentage of children in single-parent households and percent uninsured children for Ohio 2020. A stepwise linear regression was used to determine how the percentage of children in single-parent households can account for the variance in child mortality for Ohio 2020.

Results: Ohio has the highest percentage of children in single-parent homes at 32.31%, but is only statistically significant when compare to Iowa, Kansas, Minnesota, North Dakota, and Nebraska. The percentage in Ohio has risen significantly from 2016, 31.23% to 2020, 32.31%. The percentage of children in single-parent household correlates with the teenage birth rate, and can account for 26.8% of the variance in child mortality for Ohio 2020.

Key Words: Single-Parent, Pediatric Outcomes, Child Mortality

Introduction/Literature Review

In 2016, married couples in the US made up 68% of all families with children under age 18, compared to 93% in 1950¹. The family unit and dynamic in the US is trending more into single-parent households than married couples. While these changes are not and should not be viewed as inherently good or bad, it is worth investigating the effects these changes have onto the children of these modern family units.

Many studies have examined associations and correlations between family structure and child outcomes. There are many significant findings seen in the last decade. Adolescents in two-parent households are at lower risk for reporting suicidal ideation than their single-parent household counterparts, and the same trend is seen into young adulthood.² Children with two continuously married parents score higher academically than children living with single-parents.³ Increases in the percentage of children living in single-parent households are associated with increases in child mortality from accidents and homicide, but not suicides.⁴ Finally, children from single-parent families on average tend to have more sexual partners.⁵

All of the studies' above findings refer to the whole US population. This study aims to see if these associations remain when looked at the State level. After comparing percentage of

children in single-parent family in the Midwest for 2020, we will see how the Ohio percentage of children in single-parent households has changed from 2016 – 2020. Further, we will look for correlations between children in single-parent households and percent uninsured children, and teenage birth rate for 2020. This study chooses to investigate teenage birth rate instead of number of lifetime sexual partners to build upon Cheshire’s findings⁵ and apply them specifically to the pediatric population. Further, this study will take the next step from Amato’s 2016 study⁴ that showed a correlation in single-parent households and child mortality and see if, for Ohio 2020, percentage of children in single-parent household can predict child mortality.

Research Questions

This study has four research questions:

1. What is the comparison in state percentages of children in single-parent households in the Midwest for 2020?
2. What is the change in percentage of children in single-parent households from Ohio 2016 to Ohio 2020?
3. What is the correlation between percentage of children in single-parent households and the teenage birth rate for Ohio 2020?
4. How can the percentage of children in single-parent households for Ohio 2020 account for the variance in child mortality?

The author of this study hypothesizes that the percentage of children in single-parent households has significantly increased in Ohio from 2016 to 2020, that the percentage of children in single-parent households correlates with the teenage birth rate for Ohio 2020, and that the percentage of

children in single-parent households can account for the variance in child mortality in Ohio 2020.

Methods

Context/Protocol

All data points are taken from countyhealthrankings.org. All data that is published in 2020 on the website is from 2018 aggregates. Data on percentage of children in single-parent households is provided to the website by the American Community Survey. Data on teenage birth and child mortality were provided to County Health Rankings by the National Vital Statistics System, which receives data directly from jurisdictions that record such events. A single-parent household is defined as a family household that is headed by either a single male householder or single female householder.

Data Collection

The author of this study collected data directly from County Health Rankings. All appropriate data was compiled onto a comprehensive excel spreadsheet. All quantitative variables for each statistic listed above will be used, there is no exclusion criteria. Midwest states are determined by the US Census Bureau and include Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.⁶ This study will utilize the quantitative data to assess correlations between percentage children in single-parent households and various pediatric outcomes. This study uses approximately 352 different data points for the state of Ohio (1 data point for each county, for each variable). Also 1 data point for each county in each state in the Midwest is used, adding an additional 865 data points for a total of 1,217 data points that were analyzed.

Data Analysis

To compare Midwest states percentages of children in single-parent households for 2020 (RQ1), an using ANOVA with post-hoc will be used. To compare Ohio percentage of children in single-parent households for 2016 to 2020 (RQ2), a paired t-test will be used To assess correlation in Ohio 2020 percentage of children in single-parent households and teenage birthrate (RQ3), a Pearson correlation will be used. To determine how the percentage of children in single-parent households can account for the variance in child mortality in Ohio 2020 (RQ4), a stepwise linear regression will be used.

Results

Midwest percentage of children in single-parent households for 2020 is significantly different ($F_{11,1043} = 87.67, p < .001$). Kansas has a statistically significantly lower percentage (4.09%) than all other Midwest States ($p < .001$). Ohio has the highest percentage in the Midwest (32.31%) but is only statistically significant when compared to Iowa, Kansas, Minnesota, North Dakota, and Nebraska (Table 1).

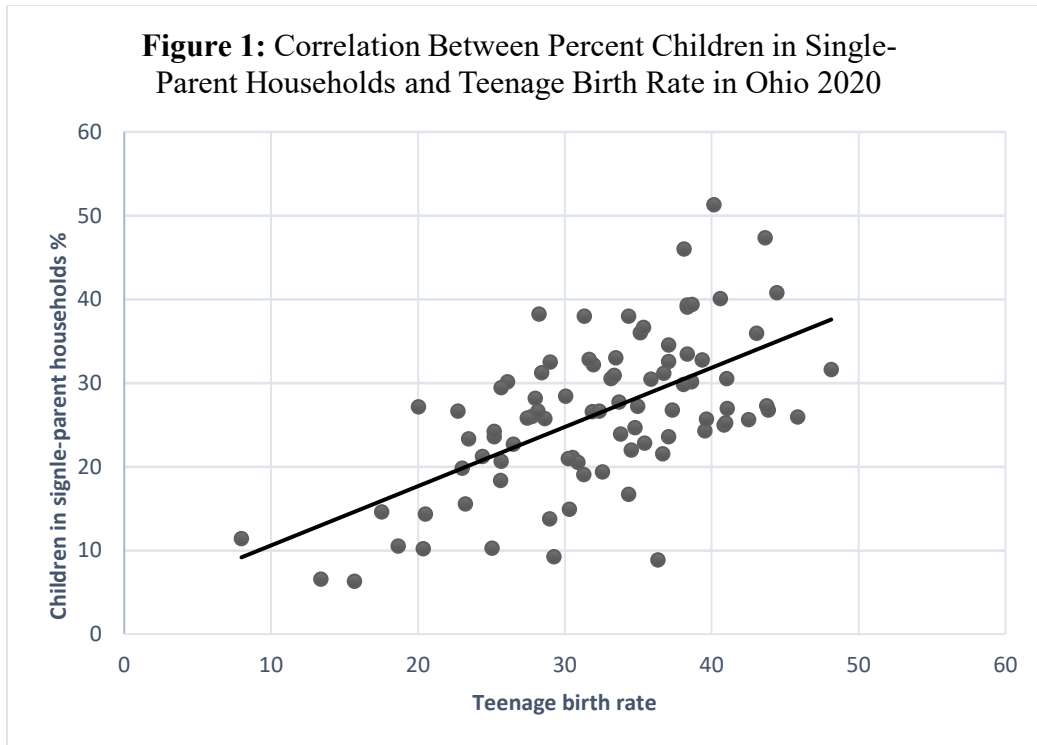
State	n	Mean	SD
Ohio	88	32.31%	7.77%
Illinois	102	31.63%	8.34%
Indiana	92	30.56%	6.66%
Iowa	99	26.62% ^a	6.99%
Kansas	105	4.09% ^a	0.52%
Michigan	83	32.12%	5.95%
Minnesota	87	27.96% ^b	6.82%
Missouri	115	30.89%	7.36%
North Dakota	53	23.48% ^a	12.76%
Nebraska	93	22.36% ^a	8.98%

South Dakota	66	28.53%	16.99%
Wisconsin	72	29.01%	7.89%
Abbreviation: SD, Standard Deviation			
^a statistically significantly different from Ohio ($p < .001$)			
^b statistically significantly different from Ohio ($p < .05$)			

Ohio percentage of children in single-parent households has increased from 2016 (31.23%) to 2020 (32.31%). Analysis shows a statistically significant increase ($t = 2.857, p = .005$) (Table 2).

Table 2: Children in single-parent households for Ohio 2016 compared to 2020			
Year	n	Mean	SD
2016	88	31.23%	7.48%
2020	88	32.31% ^a	7.77%
Abbreviation: SD, Standard Deviation			
^a statistically significantly different from 2016 ($p < .05$)			

Teen birth rate is correlated with the percentage of children in single-parent households for Ohio 2020. Pearson correlation indicated a moderate and significant correlation ($r = .602, p = < .001$) where, as the percentage of children in single-parent households increases, the teen birth rate increases (Figure 1).



Pearson correlation indicates a significant positive correlation ($r = .602, p < .001$), as the percentage of children in single-parent households increases, the teenage birth rate also increases.

The percentage of children in single-parent households can account for the variance in child mortality for Ohio 2020. Step wise linear regression indicates the model is significant ($F_{1,82} = 29.95, p < .001$), and accounts for 26.8% of the variance in child mortality (R^2). The correlation coefficient between these two variables is 0.5177 (R). Percent children in single-parent households contributed significantly to the model ($B = 0.885, t = 5.47, p < .001$).

Discussion

In the Midwest, Kansas has a significantly lower percentage of children in single-parent households than the rest of the States, while Ohio has the highest percentage. This scope of this study is limited to determining these percentages for the Midwest, but not speculating on why this could be. Future studies are warranted in this area to compare these States' pediatric outcomes and see if there are further associations between the percentage of children in single-parent households and pediatric outcomes, as seen in the literature and in this study.

For Ohio 2020, the percentage of children in single-parent households has significantly increased from 2016. This supports the above hypothesis that the percentage would have increased and is in line with US Census remarks on changes in family dynamics that increase the number of single-parent households.¹ Further, for Ohio 2020, the increase in percent of children in single-parent households is significantly correlated with the teenage birthrate (Figure 1). This supports the hypothesis that these variables are correlated. Also, it adds additional information to Chesire's 2019 findings that children of single-parent households have more sexual partners.⁵ This finding is important for Pediatricians and Obstetrician/Gynecologists as having a patient from a single-parent household may warrant the need for further counseling on safe sexual practice.

The final hypothesis, that the percentage of children in single-parent households could account for the variance in child mortality was supported in the data for Ohio 2020, accounting for 26.8% of the variance. These two variables are also moderately correlated with a correlation coefficient of 0.5177. This adds additional information to Amato's 2016 study that showed a correlation between these two variables, and supports that the variables are correlated.⁴ There are no previous studies looking into how percentages of children in single-parent households accounts for the variance in child mortality that can be compared to our study. It should be noted that any study attempting to predict human behavior will inherently show lower values when compared to laboratory studies. Future studies across different time periods and locations are needed to determine if the R^2 of 26.8% is the norm, a significantly high value, or an insignificant value. This finding, however, remains important to consider in healthcare for Family Medicine physicians and Pediatricians, as parents and children in single-parent family structures may need to be counseled on measures to prevent accidental or unnecessary death.

Conclusion

This study is limited by a lack of prior research directly at the State level, in particular, Ohio. Most studies of this design view the data at a national level, and thus this study is limited by generalizing that the background literature done in the Nation would apply to the individual State. The American Community sample data, like any other sample survey, is subject to error. These include, but are not limited to, sample-to-sample variation, data entry errors, data processing errors, etc.

This study is a first step for future studies to be done on pediatric outcomes at the State and even County level. This would give insight to the physicians and public health personnel on how to best address various pediatric outcomes in their specific area. Further, recognizing the correlations and associations seen in this or future studies, policies can be implemented at the local level to prevent poor pediatric outcomes, or improve good ones. This study in particular should help general practitioners know what factors in a patient's life, specifically a single-parent household family structure, should spur them to spend extra time counseling these patients to prevent pediatric mortality, teenage birth, or other poor outcomes.

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