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- **Adverse childhood experiences:**
  - Rural children, compared to urban children, were more likely to have been exposed to several types of adverse childhood experiences (ACEs): economic hardship, parental separation/divorce, household incarceration, witnessing household violence, witnessing neighborhood violence, household mental illness, and household substance misuse.
  - Compared to their urban counterparts, rural children were more likely to experience a total of four or more ACEs (10.7% vs 6.8%,  $p < 0.0001$ ).
  - Rural children were less likely than urban children to be exposed to racial mistreatment (3.6% versus 5.1%,  $p = 0.0020$ ).
- **Positive childhood experiences:**
  - On two important metrics, resilient family and connected caregiver, results for urban and rural children were similar and, encouragingly, were above 90%.
  - Rural children were more likely than urban children to have a guiding mentor (94.6% versus 89.0%).
  - Rural children were less likely than urban children to participate in after school activities but were more likely to volunteer in their school, church, or community.
  - Rural children were also more likely to reside in a supportive neighborhood.

## Rural-Urban Differences in Adverse and Positive Childhood Experiences: Results from the National Survey of Children's Health

### BACKGROUND

Adverse childhood experiences (ACEs) are potentially traumatic events of abuse, household dysfunction, and neglect that children may experience between birth and 17 years of age.<sup>1</sup> Prior research has found ACEs to be associated with risky behaviors and poor physical and mental well-being outcomes during childhood and into adulthood.<sup>2-5</sup> Conversely, positive childhood experiences (PCEs) such as a nurturing, safe, and supportive environment allow for healthy development and overall wellness.<sup>6</sup> PCEs help to mitigate the effects of ACEs and other negative events.<sup>7</sup>

Rural and minority children and adolescents frequently have higher rates of exposure to ACEs than their peers, particularly exposure to parental separation/divorce, parental death, household incarceration, household violence, household mental illness, and household substance abuse.<sup>4-5</sup> Balancing this adversity, studies have shown that rural children were also more likely than urban children to have multiple different PCEs, such as community service or volunteer work, school, or church and having a mentor for guidance.<sup>6</sup>

Previous study results on ACEs and PCEs have been limited due to differences in: 1) geographic coverage of studied datasets, 2) measurement of ACEs, and 3) sampling methodologies,

as well as limited examination of intra-rural differences among American Indian/Alaska Native (AI/AN) populations.<sup>5,8,9</sup> Furthermore, rural-urban differences in PCEs have not yet been examined using all fifty states. Previous studies were conducted using data from only 31 states and the District of Columbia (34 states and the District of Columbia for ACEs) due to potential disclosure issues. States with relatively few responses in a particular category were not included in analyses and these suppressed states tended to be either highly urban or highly rural.<sup>6</sup>

Therefore, the purpose of this policy brief is to ascertain whether ACE and PCE exposure differs between rural and urban children, by type and by count. This is the first study to estimate rural-urban differences in ACEs and PCEs using all fifty states and the District of Columbia. This policy brief is one of a three-part series. Additional briefs examine racial/ethnic differences in ACEs and PCEs among rural children and focus on the degree to which children exposed to ACEs also have potentially strengthening PCEs.

## METHODS

Data were drawn from the 2016-2018 National Survey of Children’s Health (NSCH), using the Research Data Center (RDC) access to obtain geographic information. The NSCH is an online and mail survey of U.S. households with children ages 0-17 years; parents or guardians answer questions regarding the child’s physical and emotional health.<sup>10</sup> A total of 102,341 samples were collected including 50,212 interviews in 2016, 21,599 in 2017 and 30,530 in 2018. Our sample was limited to children who were six years of age or older, as many PCEs are only measured at school age. It was further restricted to respondents who had completed the ACE and PCE questions and had complete demographic information. The final unweighted rounded sample size was 63,000 children, per the United States Census Bureau Data Review Board (data are rounded for confidentiality purposes).

ACEs were measured using the ACE module in the NSCH and PCEs were constructed using the Healthy Outcomes Positive Experiences (H.O.P.E.) framework which includes four categories of PCEs: (1) nurturing, supportive relationships, (2) living in safe, stable environments, (3) constructive social engagement opportunities, and (4) learning social and emotional competencies.<sup>7</sup> Table 1, below includes the questions used to assess each category of this framework.

**Table 1: ACE and PCE assessment questionnaire**

| Measurement of adverse events   | Measurement of positive events  |
|---|---|
| <b>Precise questionnaire language</b>   |   |
| <p>To the best of your knowledge, has this child experienced any of the following?</p> <ol style="list-style-type: none"> <li>1. Parent or guardian divorced or separated?</li> <li>2. Parent or guardian died?</li> <li>3. Parent or guardian served time in jail?</li> <li>4. Saw or heard parents or adults slap, hit, kick, punch one another in the home?</li> <li>5. Was a victim of violence or witnessed violence in the neighborhood?</li> </ol> | <ol style="list-style-type: none"> <li>1. When your family faces problems, how often are you likely to do each of the following?               <ol style="list-style-type: none"> <li>a. Stay hopeful even in difficult times</li> <li>b. Work together to solve our problems</li> </ol> </li> <li>2. During the past 12 months, did this child participate in any type of community service or volunteer work at school, church, or in the community, age 6-17 years?</li> <li>3. During the past 12 months, did this child participate in any organized activities or lessons, after school or on weekend, age 6-17 years?</li> <li>4. How true are each of the following statements about this child, age 6-17?               <ol style="list-style-type: none"> <li>a. Child stays calm and in control when faced with a challenge</li> </ol> </li> </ol> |

|   |   |
|---|---|
| <p>6. Lived with anyone who was mentally ill, suicidal, or severely depressed?</p> <p>7. Lived with anyone who had a problem with alcohol or drugs?</p> <p>8. Treated or judged unfairly because of his or her race or ethnic group?</p> <p>9. Hard to get by on family's income—hard to cover basics like food or housing?</p> | <p>5. Other than you or other adults in your home, is there at least one other adult in this child's school, neighborhood, or community who knows this child well and who he or she can rely on for advice or guidance?</p> <p>6. To what extent do you agree with these statements about your neighborhood or community... 1) people in this neighborhood help each other out, 2) we watch out for each other's children in this neighborhood, and 3) when we encounter difficulties, we know where to go for help in our community?</p> <p>7. To what extent do you agree with these statements about your neighborhood or community... the child is safe in our neighborhood</p> |
|---|---|

## FINDINGS

### *Survey Participant Characteristics*

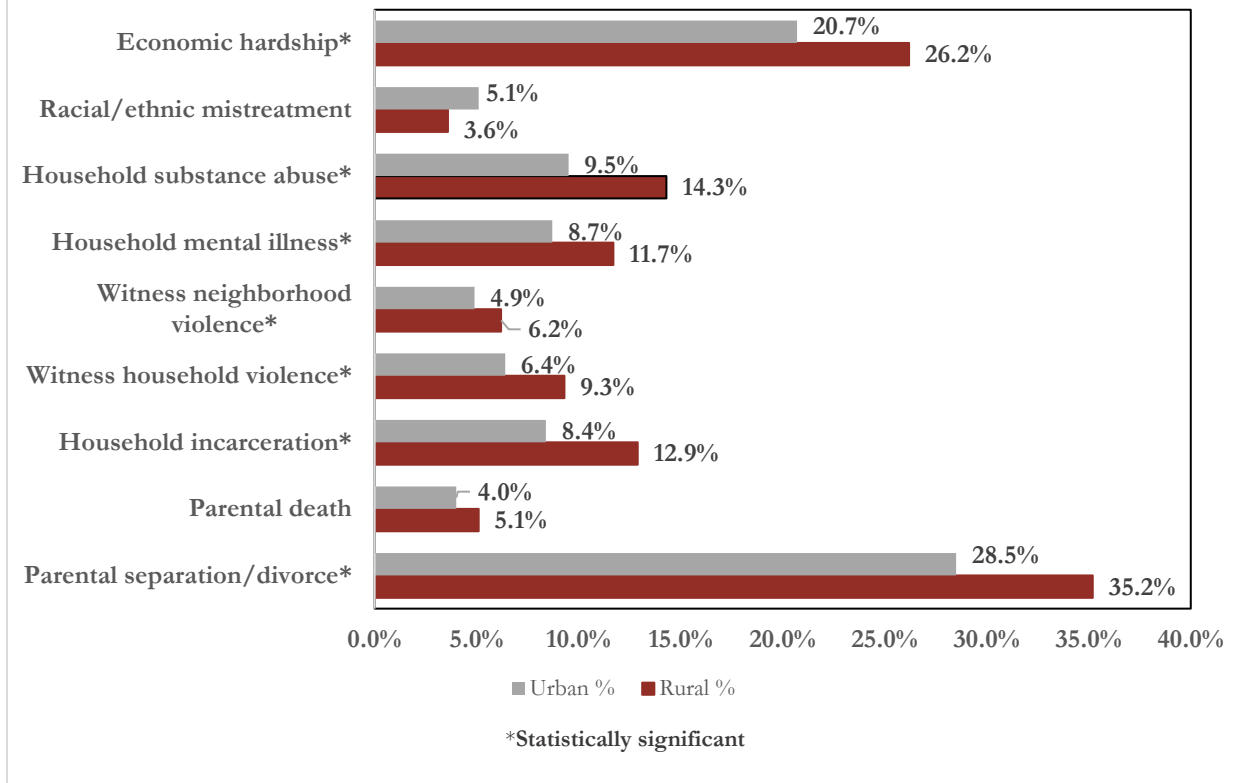
Just over eleven percent of our sample resided in a rural area (11.7%; see Table A-1 in Appendix). The majority of children were male (51.3%), aged 6 to 12 years (58.3%), and non-Hispanic white (52.9%). Slightly less than a quarter of children (23.1%) had special health care needs; a majority had private health insurance (59.9%). The individual completing the survey was most often the child's mother (62.4%). Most responding parents or guardians had some college education or beyond (71.7%). Just over ten percent of households reported a primary language other than English (13.4%). The most common household structure was a child living with both parents who are currently married (66.7%). Nearly 1 in 5 children (19.1%) lived in a household with an income below the federal poverty level.

Findings for rural and urban children differed in several ways (See Table A-1). Rural children were more likely to be non-Hispanic white (74.4%) than urban children (50.1%;  $p < 0.0001$ ). Urban households were more likely to not speak English as the primary language in the home than rural households (14.4% versus 6.3%,  $p < 0.0001$ ). A lower percentage of rural children have a caregiver whose education is some college or more, compared to urban children (65.0% versus 72.55%,  $p < 0.0001$ ). A smaller proportion of rural children lived in a household with two parents, currently married, than their urban counterparts (64.9% versus 67.0%,  $p = 0.0002$ ). Rural children were more likely to reside in a household with income below the federal poverty level compared to urban children (23.0% versus 18.6%,  $p < 0.0001$ ). Finally, a larger proportion of children residing in rural areas had public insurance, such as Medicaid, than the proportion of children residing in urban areas (35.0% versus 28.0%,  $p < 0.0001$ ).

### *ACE Exposure*

Rural children were more likely than their urban counterparts to be exposed to several types of adverse experience. Compared to urban children, rural children were more likely to experience economic hardship (26.2% vs. 20.7%), parental separation/divorce (35.2% vs 28.5%); household incarceration (12.9% vs 8.4%); witness household violence (9.3% vs 6.4%); witness neighborhood violence (6.2% vs 4.9%); household mental illness (11.7% vs 8.7%); household substance misuse (14.3% vs 9.5%;  $p < 0.01$  for all, See Figure 1 below). Urban children, on the other hand, were more likely to have been exposed to racial ethnic mistreatment than their rural peers (5.1% versus 3.6%,  $p = 0.0020$ ). This is likely due to lower percentages of non-White children in rural areas, compared to urban. Rural and urban children were equally likely to have experienced the death of a parent (4.0% vs. 5.1%,  $p < 0.01$ ).

**Figure 1: Adverse Childhood Experiences by Type  
Among children ages 6-17, National Survey of Children's Health**



Research has found that the total number of ACEs that burden an individual can affect subsequent outcomes into adulthood.<sup>1</sup> Individuals who have experienced multiple ACEs are more likely to experience poorer physical and mental health into adulthood, and are more likely to engage in risky behaviors, such as binge drinking.<sup>2</sup> Therefore, the cut-point of four or more ACEs is often used in this literature.<sup>2</sup> Children who lived in a rural area were less likely to have no ACE exposures (44.1%) than children residing in urban areas (52.5%; See Table 2 below,  $p < 0.0001$ ). Rural children had higher exposure rates to one to three ACEs (45.2% vs 40.7%,  $p < 0.0001$ ) and four or more ACEs than their urban counterparts (10.7% vs 6.8%,  $p < 0.0001$ ).

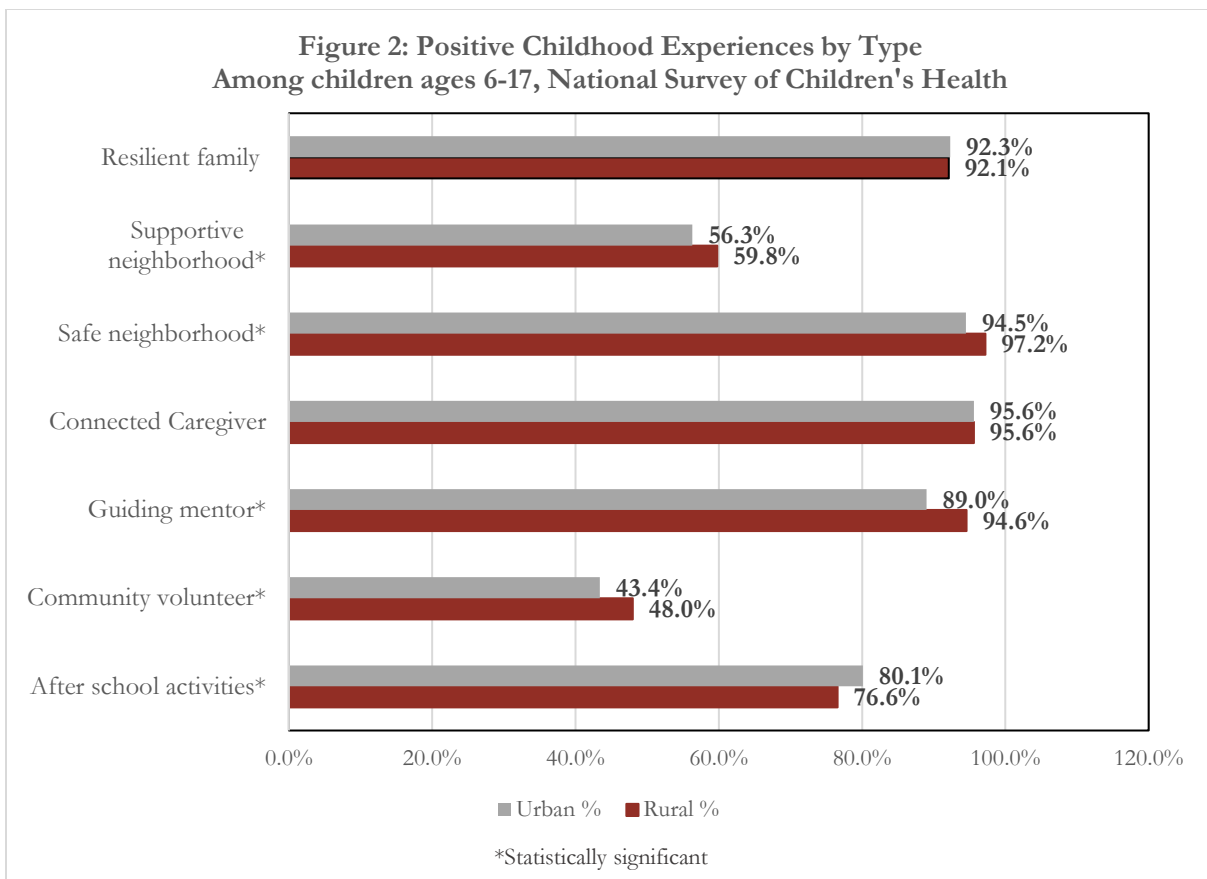
**Table 2: Adverse Childhood Experiences among children ages 6-17**

|                          | Rural (%) | Urban (%) | All (%) |
|--------------------------|-----------|-----------|---------|
| <b>ACE Summary Score</b> |           |           |         |
| 0                        | 44.1      | 52.5      | 51.5    |
| 1-3                      | 45.2      | 40.7      | 41.3    |
| ≥4                       | 10.7      | 6.8       | 7.3     |

*PCE Exposure*

The range of positive elements in a child’s life reported by their parent or guardian is shown below in Figure 2. On two important metrics, resilient family and connected caregiver (see Table 1 for definitions), values for urban and rural children were not significantly different and, encouragingly, were above 90% (See Figure 2, below). Other findings were mixed, with rural children faring slightly better or slightly worse across different potential experiences.

Compared to their urban counterparts, rural children were more likely to be reported to have engagement with a guiding mentor (94.6% vs 89.0%,  $p<0.01$ ) which is an indication of having nurturing, supportive relationships. Rural children were less likely than urban children to participate in after school activities (76.6% vs 80.1%,  $p<0.01$ ), a measure of constructive social engagement opportunities, but were more likely to volunteer in their school, church, or community (48.0% vs 43.4%,  $p<0.01$ ), another measure of constructive social engagement. Rural parents were slightly more likely to report living in a safe neighborhood than were urban parents (97.2% vs 94.5%,  $p<0.01$ ). Rural children were also more likely to reside in a supportive neighborhood than urban children (59.8% versus 56.3%,  $p<0.01$ ). There were no significant differences between rural and urban children for family resilience (92.1% vs. 92.3%) or their ability to share ideas and talk about things that matter with a caregiver (95.6% for both).



## CONCLUSIONS

Examining the prevalence of ACEs and PCEs in rural communities can provide insight on areas for possible improvement to help mitigate the long-term health and wellness impacts of ACEs. This study examined whether ACE and PCE exposure differs between rural and urban children, finding a mix of advantages and disadvantages facing rural families. Focusing first on threats to children's health and growth, our results confirm previous findings that rural children consistently have higher rates of exposure to nearly all the ACEs that were assessed, with the exceptions of parental death and racial/ethnic mistreatment, which were not statistically significant different from urban rates.<sup>5</sup>



The Centers for Disease Control and Prevention (CDC) have compiled a set of evidence-based approaches for preventing ACEs, which may be useful in addressing rural-urban disparities in exposures to ACEs.<sup>11</sup> Several of its recommendations are particularly pertinent to rural families and the problems they disproportionately experience. Strengthening economic support for families, such as a childcare subsidy or income supports, for example, could address rural disparities in economic hardship. Similarly, CDC recommendations for early childhood home visitation, by increasing parental skills through strengthening parenting programs, which teach conflict resolution, conscious discipline, and other parenting skills, and reducing stress, might improve the higher rates ACEs among rural children.

Other ACEs disparities experienced by rural children may need to be addressed from within the health services sector. Rural children disproportionately live in homes affected by current substance misuse or mental illness. Rural communities, however, are more likely than urban areas to lack effective treatment programs for alcohol and opioid misuse<sup>12,13</sup> and nearly all rural counties are health professions shortage areas for mental health care.<sup>14</sup> Development of programs that can extend treatment capability through modalities such as telehealth may help address local service shortfalls.<sup>15,16</sup>

Continued monitoring of rural children's ACEs exposure will be needed, both to monitor the effectiveness of community interventions and, unfortunately, to assess the effect of the current public health emergency. Estimates of family disruption due to COVID-19 vary, and no studies specifically examining rural children's experience of family disruption have yet been published. At the national level, researchers have estimated that for every 100 COVID deaths, 7.8 children experience parental death, with an estimated 43,000 parental deaths through February 2021.<sup>17</sup> A different research group, studying loss of a primary caregiver, whether parent or grandparent, estimated that 120,630 children faced this loss across the 15-month period from April 2020 through June 2021, with the burden falling more heavily on non-white children,<sup>18</sup> due to the racial/ethnic disparities seen with COVID morbidity and mortality. Given the trajectory of the epidemic over time, the COVID-19 pandemic may have placed rural children at increased risk for parental loss, as rural vaccination rates have been lower, and rural death rates higher, for this disease.<sup>19,20</sup>

Countering the problem of ACEs, PCEs offer building blocks for increasing family resiliency and improving eventual health and social outcomes. Rural children benefit from higher rates of several PCEs when compared to urban children, including volunteerism, mentorship, and supportive neighborhoods. A new finding from this study, which uses a full fifty state sample, was that rural children were more likely to experience residing in a safe neighborhood than their urban counterparts, a difference that was not significant in prior work.<sup>6</sup> Building opportunities outside the family itself will call for reaching beyond the health care or public health systems to engage and strengthen community organizations that serve youth and provide opportunities for youth to serve others.

Continued public health surveillance of conditions and outcomes within rural families is essential, particularly given the system shocks imposed by the COVID-19 pandemic, which is ongoing at the time this brief is produced. In addition, as noted in the introduction, this policy brief is one of a three-part series, with the next part examining racial/ethnic differences in ACEs and PCEs among rural children. In addition to monitoring outcomes, additional research is needed to clarify the types of community institutions that currently provide support to rural families, to ascertain successful programs and identify gaps in service provision across communities.

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## APPENDIX

### *Technical Notes*

Data for the report were drawn from the combined 2016 and 2017-2018 rounds of the National Survey of Children's Health (NSCH). The NSCH is an online and mail survey reaching a representative sample of US households with children age 0 – 17 years. NSCH interviews last approximately 30 minutes and are conducted with a parent or other caregiver (e.g., grandparent) responsible for the child.<sup>10</sup> Detailed address information, needed for categorizing respondents by rurality, is not available in the NSCH public-use data sets. Thus, final analyses were conducted using restricted data sets at the Triangle Research Data Center/RDC in Raleigh, NC. The U.S. Census Bureau now houses the NSCH and some disclosure protocol changes have arisen. Due to disclosure risk issues with the Census, output with region and intra-rural analyses were not released.

### *Measures*

Residence was classified using 2013 Rural Urban Commuting Area (RUCA) codes, which measures rurality at the census tract level.<sup>21</sup> The use of RUCA rather than county allowed for inclusion of rural areas in large urban counties, which cover many areas of the West. This study did not use the FORHP definition, which adjust for some larges area census tracts.

Race and ethnicity were self-reported by the parent and classified as non-Hispanic white, Non-Hispanic Black, Hispanic, and American Indian/Alaska Native, Asian/Pacific Islander, and "Other" racial groups.

Adverse events tracked by the NSCH include: parent or guardian divorced or separated, parent or guardian died, parent or guardian served time in jail, saw or heard parents or adults slap, hit, kick, punch one another in the home, was a victim of violence or witnessed violence in neighborhood, lived with anyone who was mentally ill, suicidal, or severely depressed, lived with anyone who had a problem with alcohol or drugs, treated or judged unfairly because of his or her race or ethnic group, and economic hardship: hard to cover basics like food or housing.

Positive events measured by the NSCH are: child participates in sports, clubs, and lessons after school, child volunteers at church, community, or school, family faces problems, willingness to work together, family resilience, likely to stay hopeful in difficult situations, and at least one adult who the child can rely on for guidance and support. The NSCH also asks about "Any paid work, including regular jobs as well as babysitting, cutting grass, or other occasional work?" This was not included in this analysis but could be worthwhile to examine in future work.

### *Analysis*

Descriptive statistics were used to present the sociodemographic and socioeconomic characteristics of children and adolescents in rural and urban communities, as well as ACE and PCE exposure (both by type of ACE and the count of ACEs) by rurality. Descriptive statistics and bivariate analyses were employed to estimate unadjusted associations, frequencies, and proportions. Appropriate survey sampling weights, cluster, and strata were used as instructed by the NSCH. Due to the large sample size, values were  $p < 0.01$  were considered statistically significant.



**Table A-1. Characteristics of Children ages 6 – 17, National Survey of Children’s Health (years), in Total and Stratified by Residence**

| Characteristic                             | All % | Rural | Urban | P-value          |
|--|-------|-------|-------|------------------|
|  |       | %     | %     |                  |
| <i>Characteristics of Child</i>            |       |       |       |                  |
| Sex of Child                               |       | 11.7  | 88.3  | 0.1037           |
| Male                                       | 51.3  | 52.8  | 51.1  |                  |
| Female                                     | 48.7  | 47.2  | 48.9  |                  |
| Age of Child                               |       |       |       | 0.3113           |
| 6 to 12 years old                          | 58.3  | 57.4  | 58.4  |                  |
| 13 to 17 years old                         | 41.7  | 42.6  | 41.6  |                  |
| Race/Ethnicity of Child                    |       |       |       | <b>&lt;.0001</b> |
| Non-Hispanic White                         | 52.9  | 74.4  | 50.1  |                  |
| Non-Hispanic African American              | 13.1  | 8.1   | 13.8  |                  |
| Hispanic                                   | 24.5  | 11.4  | 26.2  |                  |
| NH American Indian/Alaska Native           | 4.4   | 0.8   | 4.8   |                  |
| NH Asian/Pacific Islander                  | 0.4   | 0.8   | 0.3   |                  |
| Other                                      | 4.7   | 4.4   | 4.7   |                  |
| Special Health Care Needs                  |       |       |       | 0.1396           |
| Yes  | 23.1  | 24.2  | 23.0  |                  |
| Health Insurance for Child                 |       |       |       | <b>&lt;.0001</b> |
| Public                                     | 28.8  | 35.0  | 28.0  |                  |
| Private                                    | 59.9  | 50.4  | 61.2  |                  |
| Public and Private                         | 4.4   | 5.7   | 4.2   |                  |
| Not Insured/ Unspecified                   | 6.9   | 8.9   | 6.6   |                  |
| <i>Characteristics of Parent/Household</i> |       |       |       |                  |
| Respondent’s Relation to Child             |       |       |       | <b>&lt;.0001</b> |
| Mother                                     | 62.4  | 64.8  | 62.1  |                  |
| Father                                     | 27.3  | 22.5  | 28.0  |                  |
| Other                                      | 10.3  | 12.7  | 10.0  |                  |
| Primary Language                           |       |       |       | <b>&lt;.0001</b> |
| Not English                                | 13.4  | 6.3   | 14.4  |                  |
| Guardian Education                         |       |       |       | <b>&lt;.0001</b> |
| Less than high school or high school       | 28.3  | 35.0  | 27.5  |                  |
| Some college or more                       | 71.7  | 65.0  | 72.5  |                  |
| Family Structure                           |       |       |       | <b>0.0002</b>    |
| Two parents, currently married             | 66.7  | 64.9  | 67.0  |                  |
| Two parents, not currently married         | 7.7   | 7.0   | 7.8   |                  |
| Single mother                              | 19.4  | 20.2  | 19.3  |                  |
| Other                                      | 6.1   | 8.0   | 5.9   |                  |
| Poverty/Income Level                       |       |       |       | <b>&lt;.0001</b> |
| 0-99% Federal Poverty Level                | 19.1  | 23.0  | 18.6  |                  |
| 100%-199% Federal Poverty Level            | 21.3  | 25.0  | 20.8  |                  |
| 200%-399% Federal Poverty Level            | 27.4  | 32.4  | 26.8  |                  |
| 400% Federal Poverty Level or above        | 32.1  | 19.6  | 33.8  |                  |

Bolded p-values represent statistical significance at  $p < 0.05$

## REFERENCES

- [1] Felitti VJ, Anda RF, Nordenberg D, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med.* 2019; 56(6), 774-786.
- [2] Crouch, E, Stropolis M, Bennett KJ, Morse M, Radcliff E. Assessing the interrelatedness of multiple types of adverse childhood experiences and odds for poor health in South Carolina adults. *Child Abuse Negl.* 2017; 65, 204-211.
- [3] Crouch E, Nelson J, Radcliff E, Martin A. Exploring associations between adverse childhood experiences and oral health among children and adolescents. *J Public Health Dent.* 2019 Dec;79(4):352-360.
- [4] Crouch E, Probst JC, Radcliff E, Bennett KJ, McKinney SH.. Prevalence of adverse childhood experiences (ACEs) among US children. *Child Abuse Negl.* 2019; 92, 209-218.
- [5] Crouch E, Radcliff E, Probst JC, Bennett KJ, McKinney SH. Rural-Urban Differences in Adverse Childhood Experiences Across a National Sample of Children. *J Rural Health.* 2020; Jan;36(1):55-64.
- [6] Crouch, E., Radcliff, E., Merrell, M. A., & Bennett, K. J. (2020). Rural-Urban Differences in Positive Childhood Experiences Across a National Sample. *The Journal of Rural Health.*
- [7] Sege RD, Browne CH. Responding to ACEs with HOPE: Health outcomes from positive experiences. *Acad Pediatr.* 2017; 17(7), S79-S85.
- [8] Radcliff E, Crouch E, Stropolis M. Rural–urban differences in exposure to adverse childhood experiences among South Carolina adults. *Rural Remote Health,* 2018; 18(1).
- [9] Talbot J, Szlosek D, Ziller E. Adverse childhood experiences in rural and urban contexts. Research & Policy Brief. 2016. <https://muskie.usm.maine.edu/Publications/rural/Adverse-Childhood-Experiences-Rural.pdf>. Accessed 25 May 2021.
- [10] Data Resource Center for Child and Adolescent Health. Available at <http://childhealthdata.org/learn/NSCH>. Accessed May 27, 2021.
- [11] Centers for Disease Control and Prevention (2019). *Preventing Adverse Childhood Experiences: Leveraging the Best Available Evidence.* Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention.
- [12] Abraham AJ, Yarbrough CR. Availability of Medications for the Treatment of Alcohol Use Disorder in U.S. Counties, 2016-2019. *J Stud Alcohol Drugs.* 2021 Nov;82(6):689-699.
- [13] Lister JJ, Weaver A, Ellis JD, Himle JA, Ledgerwood DM. A systematic review of rural-specific barriers to medication treatment for opioid use disorder in the United States. 2020 May 3;46(3):273-288.

- [14] Rural Health Information Hub, Rural Data Explorer. Available at <https://www.ruralhealthinfo.org/data-explorer?id=209&classification=Nonmetropolitan>. Accessed Nov 7, 2021.
- [15] Wang L, Weiss J, Ryan EB, Waldman J, Rubin S, Griffin JL. Telemedicine increases access to buprenorphine initiation during the COVID-19 pandemic. *J Subst Abuse Treat*. 2021 May;124:108272.
- [16] Cole TO, Robinson D, Kelley-Freeman A, Gandhi D, Greenblatt AD, Weintraub E, Belcher AM. Patient Satisfaction With Medications for Opioid Use Disorder Treatment via Telemedicine: Brief Literature Review and Development of a New Assessment. *Front Public Health*. 2021 Jan 21;8:557275.
- [17] Kidman R, Margolis R, Smith-Greenaway E, Verdery AM. Estimates and Projections of COVID-19 and Parental Death in the US. *JAMA Pediatr*. 2021 Jul 1;175(7):745-746.
- [18] Hillis SD, Blenkinsop A, Villaveces A, Annor FB, Liburd L, Massetti GM, Demissie Z, Mercy JA, Nelson CA 3rd, Cluver L, Flaxman S, Sherr L, Donnelly CA, Ratmann O, Unwin HJT. COVID-19-Associated Orphanhood and Caregiver Death in the United States. *Pediatrics*. 2021 Oct 7:e2021053760.
- [19] Murthy BP, Sterrett N, Weller D, et al. Disparities in COVID-19 Vaccination Coverage Between Urban and Rural Counties — United States, December 14, 2020–April 10, 2021. *MMWR Morb Mortal Wkly Rep* 2021;70:759–764.
- [20] Weber L. Covid Is Killing Rural Americans at Twice the Rate of Urbanites. Kaiser Health News, Sept 30, 2021.. Available at <https://khn.org/news/article/covid-death-rate-rural-america/>. Accessed November 17, 2021.
- [21] United States Department of Agriculture. 2010 Rural-Urban Commuting Area (RUCA) Codes. <http://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/documentation.aspx>. Accessed May 27, 2021.