POLICY BRIEF
NOVEMBER 2026

University of South Carolina
Rural Health Research Center

A Rural-Urban Comparison of Children's Health in the United States, 2018-2023

Emma Boswell, MPH, Taryn Farrell, MPH, Nicholas Yell, PhD, Peiyin Hung, PhD, Elizabeth Crouch, PhD

Key Points:

- Rural children are more likely than urban children to experience certain health risk factors including lower access to health care, poverty, and food insecurity.
- Rural children are more likely than urban children to receive care within a medical home and live in safer neighborhoods.
- Compared to urban children, rural children are less likely to receive preventive primary and dental care.
- Rural children are more likely than urban children to have lifelong health conditions and poor dental health.
- All-cause mortality rates are significantly higher among rural children than urban children and vary by Census Region.

INTRODUCTION

Childhood health and well-being impact health for the rest of a person's life; experiences, behaviors, and health problems that first occur during childhood have long-term impacts.[1] Current research suggests that the beginnings of adulthood disease is often found in childhood or adolescence either through cumulative damage starting from a young age or through risk factors for poor health that are ingrained during sensitive developmental periods.[1] For example, inadequate nutrition, recurrent infections, and other constraints on growth during early childhood are associated with higher rates of poor physical and mental health in adulthood.[2,3] Early childhood experiences also shape the development of the brain which is critical to future learning, behavior, and health.[3] Understanding risk factors for poor health in childhood is essential to predicting and preventing negative health outcomes throughout a person's life.

The environment in which a child grows up strongly influences their health in childhood and through the rest of their life.[3] Previous research has found that rural and urban children have significantly different lived experiences, environments, health risk factors, health outcomes, and health services utilization. Compared to their urban counterparts, rural children are significantly more likely to have gone without running water in the past six months, live in a home without a carbon monoxide detector, and live with someone who smokes inside the home. Rural children are more likely than urban children to live in a county with a high rate of persistent childhood poverty, to experience childhood trauma, to have poor oral health, and to be overweight or obese. Rural children are also less likely to have received certain forms of preventive care, such as dental care, than urban children.[4-8] Historically, rural children have also had higher mortality rates.[9]

Recent literature examining the health of children has either been limited in scope (focusing on a single topic or outcome), does not consider rurality, or emphasizes the health of urban children.[1-9] Other research uses data that is nearly a decade old which may lack relevance to the current landscape.[9] Therefore, this brief seeks to provide an updated, comprehensive overview of the health and well-being of rural children in the United States and the contextual factors that influence those health outcomes.

METHODS

Data from multiple sources were leveraged for this analysis including two years (2022-2023) of the National Survey of Children's Health (NSCH), the 2023 Survey of Income and Program Participation (SIPP), the 2023 American Housing Survey (AHS), the 2026 county-level list of Health Professional Shortage Areas (HPSAs) published by the Health Resources and Services Administration (HRSA), and the 2018-2023 Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiologic Research database (CDC WONDER).

The NSCH collects caregiver-reported information about the physical and mental health of children, factors that may impact their wellbeing, and health services utilization.[10,11] The use of sampling and design weighting ensures that it is representative of all non-institutionalized children under the age of 18 in the United States.[10,11] SIPP is a nationally representative, longitudinal dataset that collects information on household income, composition, employment, and participation in government programs.[12] The AHS is a longitudinal survey that collects information from the same housing units every other year about the quality of housing in the United States.[13] The sample weighting used by the AHS ensures that it is representative of all households in the United States.[14] The 2026 HPSA list published by HRSA consists of all geographic areas in the United States that have a primary care, dental care, or mental health care workforce shortage, meaning that there are not enough healthcare providers working there to adequately serve the needs of the county's population.[15,16] The presence of a workforce shortage is based on the ratio of health professionals to the population, the needs of that population, and is specific to the health discipline[15,16] CDC WONDER provides information about mortality rates, prevalence, and incidence rates of certain diseases throughout the United States.[17]

The principal independent variable is rurality measured at the county level. Across data sources, rurality is operationalized using metropolitan and non-metropolitan classification based on various definitions of rurality across datasets due to data availability (see appendix for full list of rural definitions in context). In this brief, we refer to non-metropolitan areas as rural and metropolitan areas as urban. For data sources that use the Core-Based Statistical Areas (NSCH, SIPP, AHS, and HPSAs) as the measure of rurality, metropolitan statistical areas are considered urban, and all non-metropolitan statistical areas are considered rural. CDC WONDER defines rurality using the National Center for Health Statistics' Rural Urban Classification Scheme in which levels 1-4 are considered urban and levels 5-6 (micropolitan and non-core) are considered rural. The main dependent variables are health outcomes, health risk factors, and health services use as described in the Appendix. Rural-urban differences in each of the outcomes were compared using Chi-Square tests. Poisson tests were used when comparing rural-urban differences in all-cause mortality. For all statistical tests, a significance level of $\alpha=0.05$ was used. Where appropriate, design weighting was used according to the guidelines of each data source.

FINDINGS

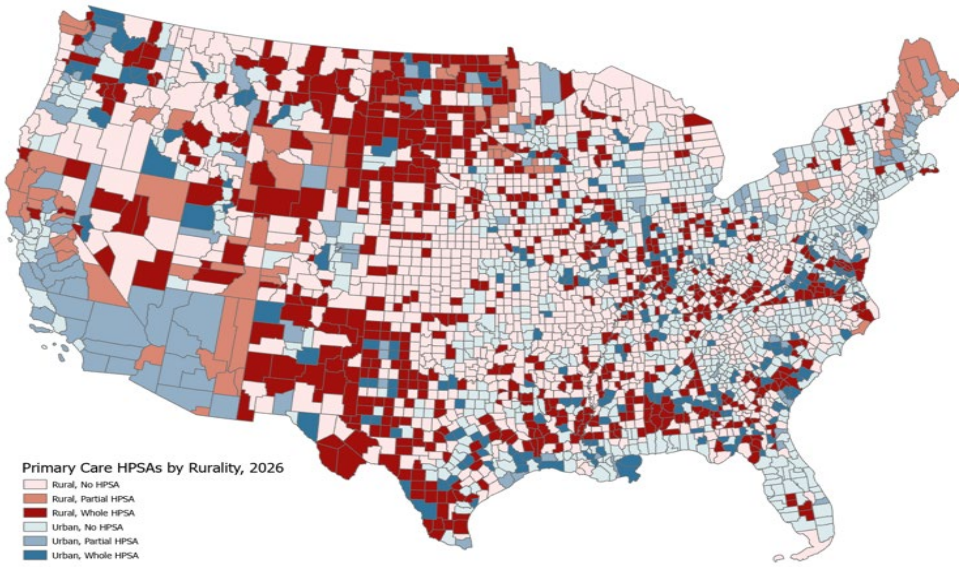
Rural-Urban Differences in Risk Factors for Poor Health

Structural Risk Factors

Compared to urban children, rural children are more likely to experience shortages of primary care, dental care, and mental health care providers (Figure 1a, 1b, 1c). Over a third (34.9%) of non-metropolitan counties in the U.S. are designated as whole-county primary care HPSAs compared to only 19.7% of metropolitan counties ($p<0.0001$).

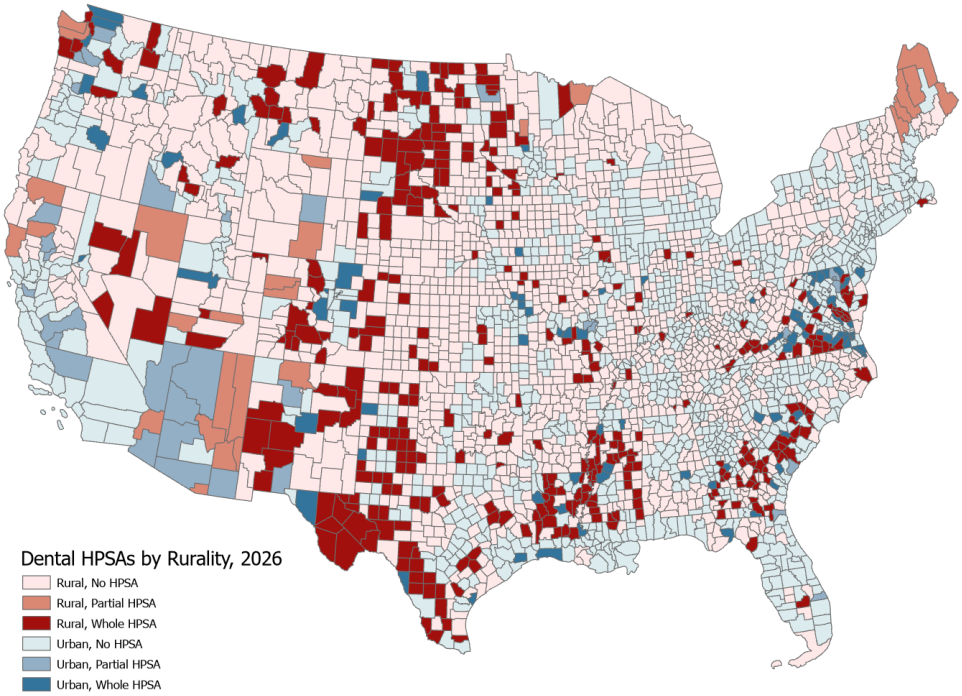
There are almost three times the number of non-metropolitan counties with whole county dental HPSAs than metropolitan counties (20.0% vs. 7.8%, $p<0.0001$). Nearly three-quarters (72.6%) of non-metropolitan counties have a whole county mental health HPSA compared to 37.5% of metropolitan counties ($p<0.0001$).

*Figure 1a. Primary Care Health Professional Shortage Areas by Rurality**



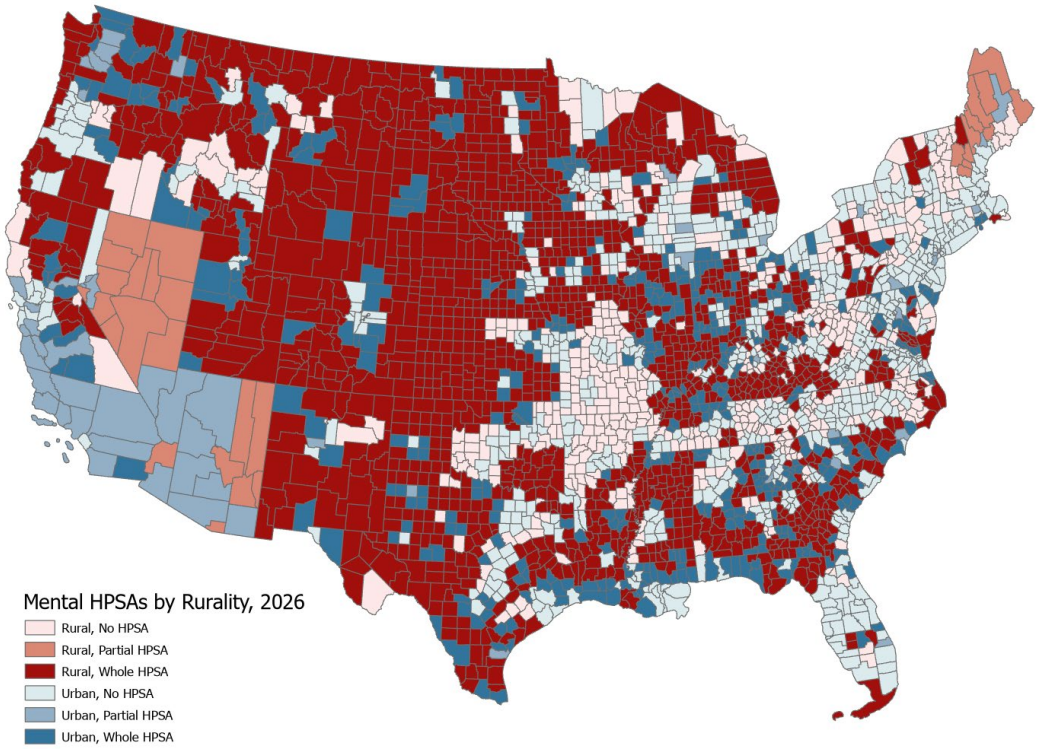
**Data comes from 2026 HRSA Workforce Data*

*Figure 1b. Dental Health Professional Shortage Areas by Rurality**



**Data comes from 2026 HRSA Workforce Data*

*Figure 1c. Mental Health Professional Shortage Areas by Rurality**



**Data comes from 2026 HRSA Workforce Data*

Rural children are more likely than urban children to be uninsured (8.3% vs. 6.6%, p=0.0004, Table 1), to have only public insurance (38.9% vs. 28.4%, p<0.0001), and to lack continuous insurance (8.9% vs. 7.8%, p=0.0243). Rural children are more likely to be adequately insured (74.5% vs. 71.7%, p<0.0001). Children are adequately insured when the insurance benefits always or usually meet the child's needs and usually or always allow them to see the providers that they need, and they either have no or reasonable out-of-pocket expenses.[11]

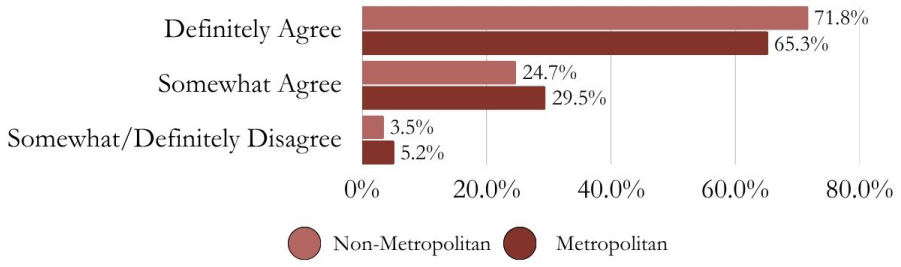
Table 1. Rural-Urban Differences in Health Insurance, (Children Age 0-17 Years)

Insurance Characteristic	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	Weighted %	Weighted %	Weighted %	p-value
Insurance Coverage*				**0.0004**
Yes	93.2%	91.7%	93.4%	
No	6.8%	8.3%	6.6%	
Insurance Coverage Type*				**<0.0001**
Public Health Insurance Only	29.9%	39.8%	28.4%	
Private Health Insurance Only	57.9%	45.1%	59.8%	
Public and Private Insurance	5.3%	6.7%	5.1%	
Uninsured	6.9%	8.4%	6.7%	
Adequate Insurance*				**<0.0001**
Yes	72.0%	74.5%	71.7%	
No	28.0%	25.5%	28.3%	
Insurance Coverage Continuity*				**0.0243**
Consistently Insured	92.1%	91.1%	92.3%	
Currently Uninsured/Gap in Coverage	7.9%	8.9%	7.8%	

**Data comes from the 2022-2023 NSCH*

When asked if their child lives in a safe neighborhood, rural caregivers reported that their children are more likely to live in a safe neighborhood with 71.8% of rural respondents stating that they "definitely agree" that they live in a safe neighborhood compared to 65.3% of urban respondents (p<0.0001, Figure 2)).

*Figure 2. Rural-Urban Differences in Neighborhood Safety, (Children Age 0-17 Years)**



** Data comes from the 2023-2024 NSCH*

Household Risk Factors

Rural children are more likely to live in poverty: 22.9% of rural children live in households below the Federal Poverty Level (FPL) (0-99%) compared to 18.0% of urban children (p<0.0001, Table 2). Rural children are also more likely to live in households that are "working poor" (16.9% vs. 13.7%, p<0.0001) which means that they live at less than 100% of the FPL despite having one caregiver employed full or part-time.[11]

Table 2. Rural-Urban Differences in Household Poverty, (Children Age 0-17 Years)

Household Income	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
Federal Poverty Level (FPL)*				**<0.0001**
0-99% of FPL	18.6%	22.9%	18.0%	
100-199% of FPL	19.7%	26.0%	18.8%	
200-399% of FPL	28.9%	32.2%	28.5%	
400% or more of FPL	32.8%	18.9%	34.8%	
Working Poor Status*				**<0.0001**
Yes	14.1%	16.9%	13.7%	
No	85.9%	83.1%	86.3%	

** Data comes from the 2022-2023 NSCH*

When caregivers were asked about their household's ability to afford the food they needed in the past twelve months, rural children were less likely to always afford to eat good nutritious meals than urban children (59.0% vs. 68.0%, p<0.0001, Table 3). Rural children were more likely to report "always [able to] afford enough to eat, but not always the kinds of food we should eat" (34.0% vs. 26.9%, p<0.00001).[11] Rural children were also more likely than urban children to have received benefits from the Supplemental Nutrition Assistance Program (SNAP) for at least one month in 2022 (21.1% vs. 11.0% p=0.0002). There were no rural-urban differences in the likelihood of reducing or skipping a meal due to cost (p>0.05). Participants were also asked if they had received any food assistance other than SNAP (such as meals, bags of groceries, packaged foods, money, vouchers, certificates to buy groceries, or something else from a soup kitchen, shelter, or other charity. There was no-rural urban difference found (p>0.05).

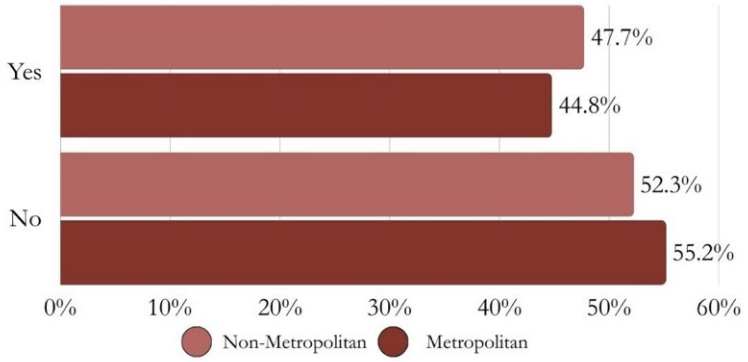
Table 3. Rural-Urban Differences in Food Insecurity, (Children Age 0-17 Years)

Food Insecurity Characteristic	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
Food Security*				**<0.0001**
Always Get Enough Nutritious Food	66.9%	59.0%	68.0%	
Always Enough Food but Not Nutritious	27.8%	34.0%	26.9%	
Sometimes Not Enough Food	4.6%	5.9%	4.4%	
Often Not Enough	0.7%	1.1%	0.7%	
Received SNAP benefits for at least 1 Month**				**0.0002**
Yes	15.3%	21.1%	11.0%	
No	84.7%	78.9%	89.0%	

** Data comes from the 2022-2023 NSCH*
*** Data comes from the 2023 SIPP*

Rural children are more likely to receive care within a medical home compared to their urban counterparts (47.7% vs. 44.8% p =0.0003, Figure 3). Children were considered to have received care within a medical home if they had a usual source of sick care, received family centered care, had no problems getting referrals to additional care, and had effective care coordination when needed.[10,11]

*Figure 3. Rural-Urban Differences in Living in a Medical Home, (Children Age 0-17 Years)**



** Data comes from the 2022-2023 NSCH*

Household safety and housing quality varies by rurality. Household safety measures included whether the home had a working carbon monoxide detector and working smoke detector which was asked of all households.[13] There were additional safety measures for households in which children six years of age and under live there or visit often including whether electrical outlets were covered, whether chemicals were stored safety, whether there was a fence around an outdoor pool (if applicable), and if all inside stairs accessible to children had gates.[13] Housing quality measures included indoor air quality, whether or not there was safe running water in the home, whether the residents had issues with running water in the past year, and whether there were any issues with the house being too hot or too cold in the past year.[13] Rural children are more likely than urban children to not have a working smoke detector (6.0% vs. 3.6%, p=0.0006, Table 4) and to not have a working carbon monoxide detector (25.4% vs. 20.4%, p=0.001). Rural children are also more likely than urban children to have mold present in their home in the past twelve months (4.5% vs. 2.8%, p=0.03). There were no rural-urban differences in other household safety measures including safely stored chemicals, covered outlets, gates on accessible stairs, and fences around outdoor pools; nor in other housing quality measures including indoor air quality, safe water, issues with running water in the past year, issues with the house being too cold, or issues with the house being too hot (p>0.05).

Table 4. Rural-Urban Differences in Household Conditions

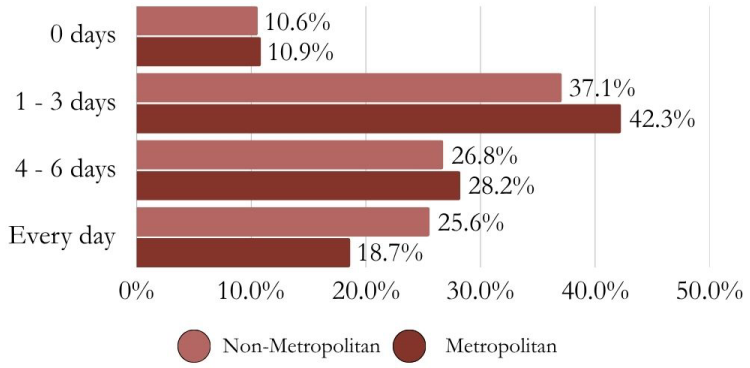
Housing Characteristic	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
Household Safety				
Working Smoke Detector*				**0.0006**
Yes	96.1	94.0	96.4	
No	3.9	6.0	3.6	
Working Carbon Monoxide Detector*				**0.001**
Yes	79.0	74.6	79.6	
No	21.0	25.4	20.4	
Housing Quality				
Any Mold Present in Home During Past 12 Months*				**0.03**
Yes	3.1	4.5	2.8	
No	96.9	95.5	97.2	

** Data comes from the 2023 AHS*

Individual Risk Factors

Compared to urban children, rural children are more likely to exercise, play sports, or engage in physical activity for 60 minutes every day (25.6% vs. 18.7%, p<0.0001, Figure 4).

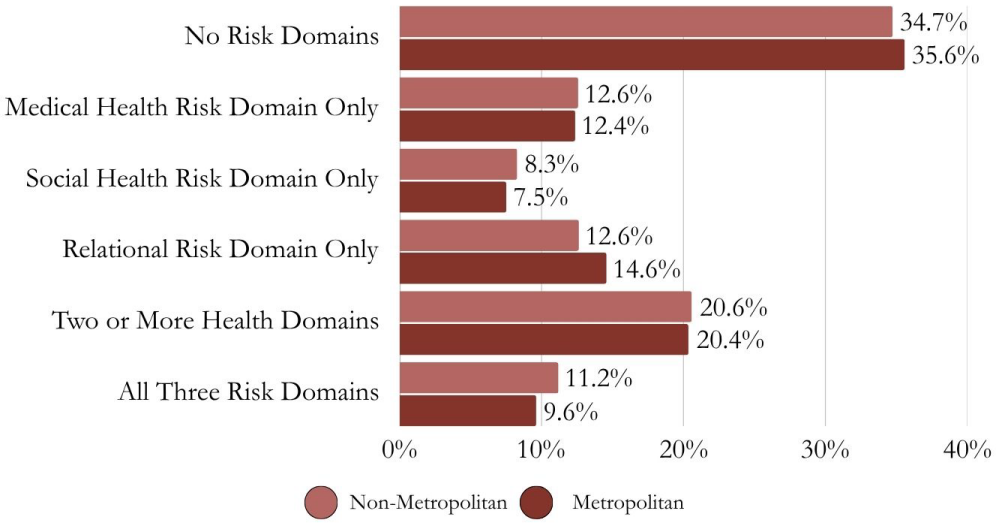
*Figure 4. Rural-Urban Differences in Physical Activity Levels, (Children Age 6-17 Years)**



** Data comes from the 2022-2023 NSCH*

Rural children are more likely to experience a greater number of whole-child risk domains with 11.2% of rural children experiencing all three risk domains (medical, social, and relational) compared to 9.6% of urban children (p=0.001, Figure 5). Urban children were more likely to have the relational risk domain only (14.6% vs. 12.6%), but the prevalence of all other categories and combinations of whole-child risk domains were greater among rural children than among urban children.

*Figure 5. Rural-Urban Differences in Whole-Child Risk Domains, (Children Age 0-17 Years)**



** Data comes from the 2022-2023 NSCH*

Rural-Urban Differences in Health Care Use

Rural children were less likely than their urban counterparts to have received at least one preventive care visit during the past twelve months (74.4% vs. 79.0%, p<0.0001, Table 5) and rural children aged 12-17 years were less likely to have received an adolescent well visit in the past year (66.6% vs. 71.8%, p=0.0001).

Table 5. Rural-Urban Differences in Receipt of Preventive Primary Care

Preventive Primary Care	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
One or More Preventive Care Visits in Past Year (Age 0-17)*				**<0.0001**
Yes	78.5%	74.4%	79.0%	
No	21.6%	25.6%	21.0%	
Adolescent Well Visit (Age 12-17)*				**0.0001**
Yes	71.1%	66.6%	71.8%	
No	28.9%	33.4%	28.2%	

** Data comes from the 2022-2023 NSCH*

There are significant rural-urban differences in the receipt of dental care for children aged one year or older. Rural children were less likely to have received any form of dental care (21.1 vs. 17.1%, p<0.0001, Table 6) and to have had a preventive dental care visit (75.3% vs. 79.5%, p<0.0001) in the past year compared to urban children. Among children who received preventive dental care, rural children were less likely to have received fluoride treatment than urban children (29.9% vs. 33.7%, p<0.001).

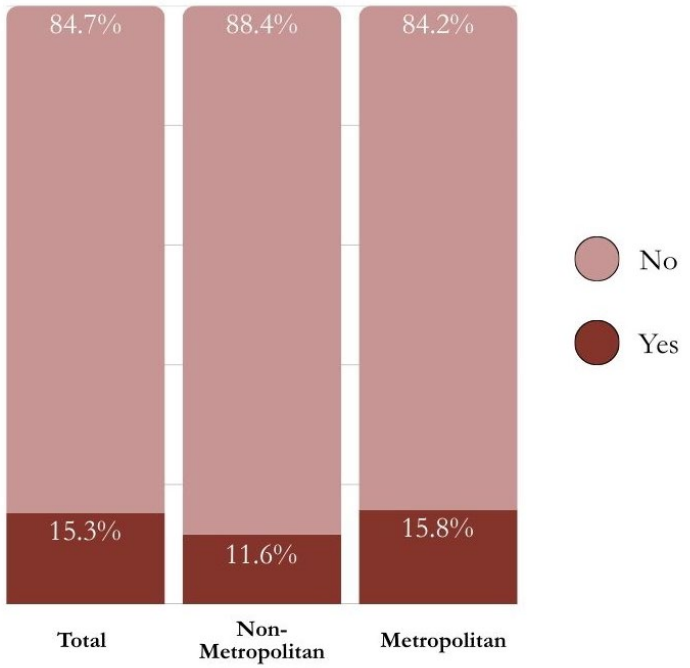
Table 6. Rural-Urban Differences in Receipt of Dental Care, (Children Age 1-17 Years)

Preventive Dental Care	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
Dental Care in Past Year*				**<0.0001**
Saw a Dentist or Other Oral Health Care Provider	75.7%	71.9%	76.2%	
Saw Other Oral Health Care Provider	1.5%	1.9%	1.4%	
Saw Both Dentist and Other Oral Health Care Provider	5.2%	5.2%	5.2%	
No Dental or Oral Health Care Visit	17.6%	21.1%	17.1%	
Preventive Dental Visit*				**<0.0001**
Yes	79.0%	75.3%	79.5%	
No	21.0%	24.7%	20.5%	
Received Fluoride Treatment*				**<0.0001**
Received Fluoride Treatment	45.7%	45.2%	45.8%	
Preventive Dental Care, Not Treatment	33.2%	29.9%	33.7%	
Did not Receive Preventive Dental Care	21.1%	24.9%	20.6%	

** Data comes from the 2022-2023 NSCH*

Rural children were less likely to have used telehealth in the past year than urban children (11.6% vs. 15.8%, p<0.0001, Figure 6).

*Figure 6. Rural-Urban Differences in Receipt of Telehealth, (Children Age 0-17 Years)**

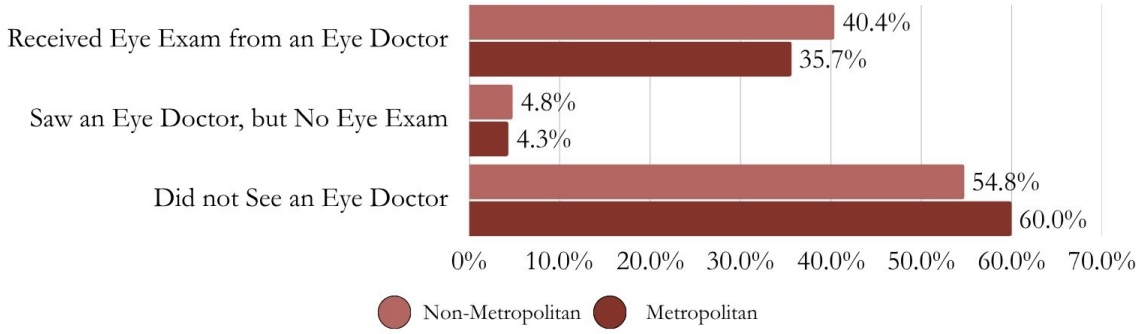


** Data comes from the 2022-2023 NSCH*

There were no rural-urban differences in the likelihood of having received specialist care (p=0.15) or mental health care (p=0.27) in the past year for children who were in need of that care. Specialist care was defined as care received from a specialist doctor, other than a mental health professional, during the past twelve months.[11] Mental health care was defined as the receipt of any treatment or counseling from a mental health professional in the past twelve months.[11]

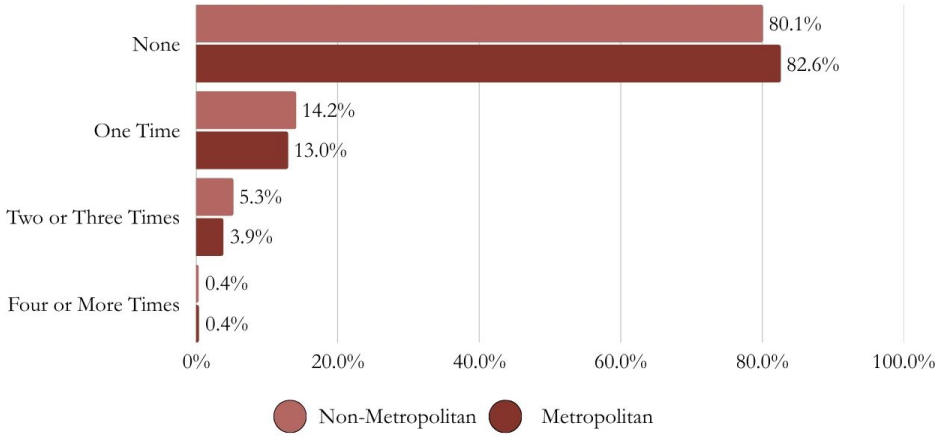
Compared to urban children, rural children were less likely to have seen an eye doctor in the past year (60.0% vs. 54.8%, Figure 7), but for children who did see an eye doctor, rural children were more likely to have received an eye exam (40.4% vs. 35.7%, p<0.0001).

*Figure 7. Rural-Urban Differences in Receipt of Vision Care, (Children Age 0-17 Years)**



Rural children were more likely to have gone to the emergency room (ER) at least once in the past year than urban children with 5.3% of rural children having 2-3 ER visits in the past year compared to 3.9% of urban children (p<0.0001, Figure 8). There were no rural-urban differences in the likelihood of being admitted to the hospital in the past year (p=0.23).

*Figure 8. Rural-Urban Differences in Past-Year Emergency Room Visits, (Children Age 0-17 Years)**



** Data comes from the 2022-2023 NSCH*

There were no rural-urban differences in the likelihood of forgoing needed health care across all types of care (p=0.91) or forgoing needed care due to cost (p=0.58), but rural children were more likely to forgo care due to a lack of care being available than urban children (43.1% vs. 32.3%, p=0.0086, Table 6). For children aged three and older, rural children were less likely to forgo needed mental health care (1.2% vs. 1.7%, p=0.02), and they were more likely to not have any difficulty getting needed mental health care (51.0% vs. 43.2, p=0.0029). There were no rural-urban differences in the difficulty getting other specialty care (p=0.80).

Table 6. Rural-Urban Differences in Foregone Care and Care Access, (Children Age 0-17 Years)

Forgone Care and Access to Care	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
Forgone Care				
Forgone Care (All Types) due to Lack of Availability*				**0.0086**
Yes	33.7%	43.1%	32.3%	
No	66.4%	56.9%	67.7%	
Forgone Needed Mental Health Care*				**0.0224**
Yes	1.6%	1.2%	1.7%	
No	98.4%	98.8%	98.3%	
Difficulty Getting Care				
Difficulty Getting Needed Mental Health Care*				**0.0029**
Did not have difficulty	44.2%	51.0%	43.2%	
Somewhat difficult	31.6%	29.5%	31.9%	
Very difficult	19.1%	15.9%	19.6%	
It was not possible to obtain care	5.1%	3.5%	5.3%	

** Data comes from the 2022-2023 NSCH*

Rural-Urban Differences in Child Health

Compared to urban children, rural children are less likely to have their general health reported as excellent or very good (88.9% vs. 90.1%, p=0.0313). Rural children are more likely to have at least one lifelong health condition with 22.3% of rural children having 2 or more health conditions compared to 20.0% of urban children (p=0.0001, Table 7). Rural children are also more likely to be overweight or obese than urban children (37.8% vs. 31.5%, p<0.0001). There were no rural-urban differences in the likelihood of having a special health care need (p=0.11), having a mental, emotional, developmental, or behavioral problem (p=0.23), or in child flourishing across all ages (p>0.05).

Table 7. Rural-Urban Differences in Overall Health and Chronic Illness

Forgone Care and Access to Care	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
General Health Status (Age 0-17)*				**0.0313**
Excellent/Very Good	89.9%	88.8%	90.1%	
Good	8.7%	9.8%	8.5%	
Fair or Poor	1.5%	1.4%	1.5%	
Lifelong Health Condition (Age 0-17)*				**0.0001**
None	59.6%	56.6%	60.0%	
1 Health Condition	20.1%	21.1%	20.0%	
2 or More Health Conditions	20.3%	22.3%	20.0%	
Obese (Age 6 -17)*				**<0.0001**
Underweight	8.9%	6.8%	9.2%	
Healthy Weight	58.8%	55.4%	59.3%	
Overweight or Obese	32.3%	37.8%	31.5%	

** Data comes from the 2022-2023 NSCH*

Among children aged one year or older, rural children are more likely than urban children to have their general tooth condition reported as fair or poor (7.6% vs. 5.4%, p<0.0001, Table 8) and to have a cavity (14.9% vs. 11.8%, p<0.0001).

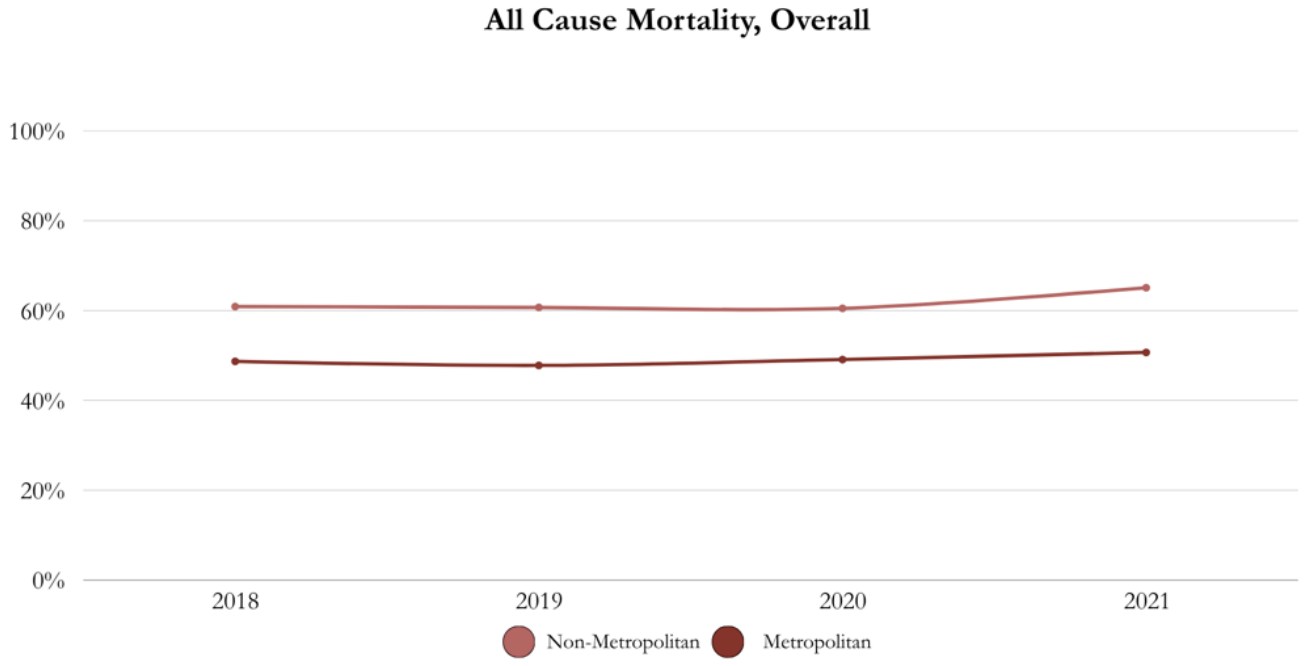
Table 8. Rural-Urban Differences in Oral Health, (Children Age 1-17 Years)

Forgone Care and Access to Care	Rurality			
	Overall	Non-Metropolitan	Metropolitan	
	%	%	%	p-value
General Tooth Condition (Age 1-17)*				**<0.0001**
Excellent/Very Good	77.8%	74.1%	78.4%	
Good	16.5%	18.4%	16.2%	
Fair or Poor	5.7%	7.6%	5.4%	
Cavities (Age 1-17)*				**<0.0001**
Yes	12.2%	14.9%	11.8%	
No	87.8%	85.1%	88.2%	

**Data comes from the 2022-2023 NSCH*

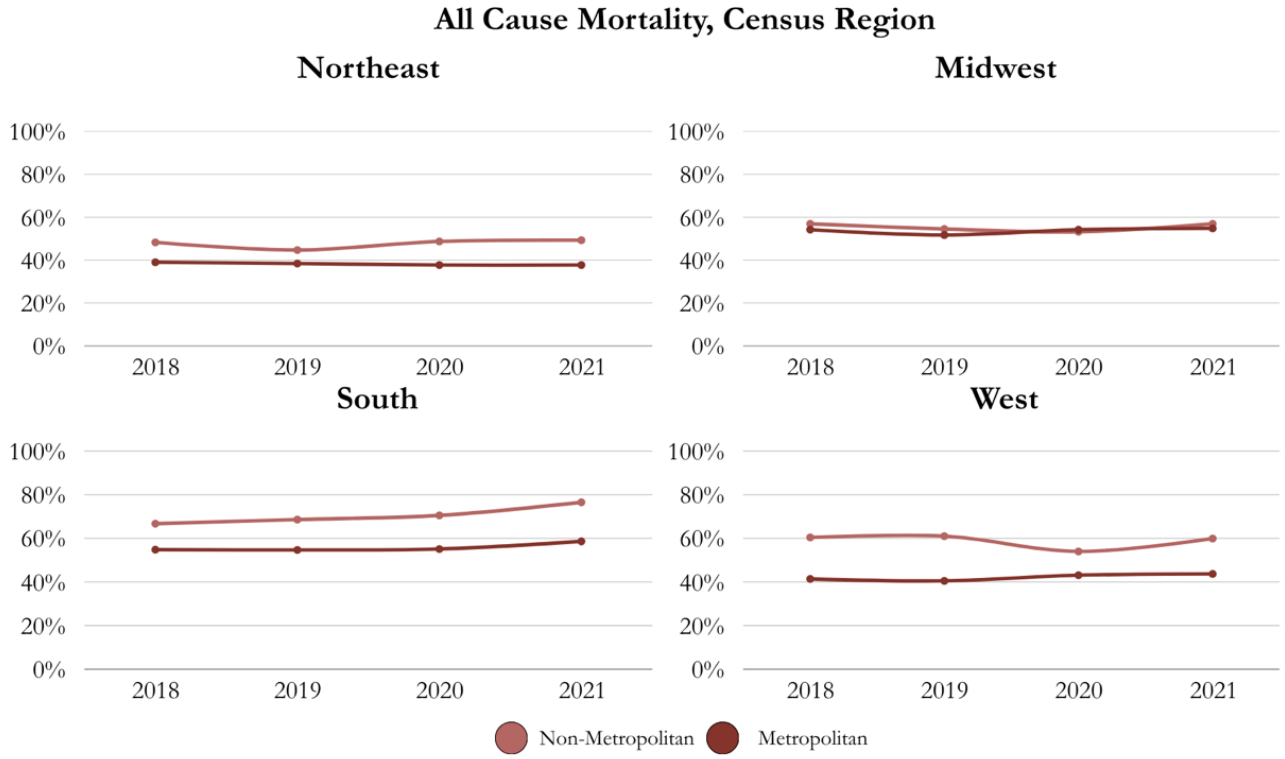
Between 2018-2021, all-cause mortality rates were higher among rural children than among urban children in the United States (p<0.0001, Figure 9). In 2021, the crude death rate for rural children was 65.1 deaths per 100,000 children compared to 50.7 deaths per 100,000 children among urban children. All-cause mortality also varies by region; the Northeast had the lowest all-cause mortality between 2018-2021 while the South had the highest all-cause mortality rates (Figure 10). Rural-urban differences in all-cause mortality persisted when broken down by Census region; rural children had higher all-cause mortality rates across all Census regions between 2018-2021 (p<0.0001 for all comparisons). The largest rural-urban differences occurred in the West in 2019 where the crude mortality rate for rural children was 61.0 deaths per 100,000 children compared to 40.5 deaths per 100,000 children for urban children. The smallest rural-urban differences in all-cause mortality occurred in the Midwest, but the differences were still statistically significant.

*Figure 9. Rural-Urban Differences in All-Cause Mortality per 100,000 Children, Overall (2018-2021)**



**Data comes from 2018-2021 CDC WONDER*

*Figure 10. Rural-Urban Differences in All-Cause Mortality per 100,000 Children, by Census Region (2018-2021)**



**Data comes from 2018-2021 CDC WONDER*

DISCUSSION

This study provides an updated overview of the risk factors, challenges, and health outcomes experienced by rural children and how these experiences and outcomes differ from urban children. Rural children are more likely than urban children to live in counties with whole or partial county HPSAs, to live in households with economic hardships, to be uninsured or inadequately insured, and to experience food insecurity. While rural children are more likely to benefit from certain protective factors such as higher rates of care within a medical home, living in a safe neighborhood, and receiving SNAP benefits, these protective factors do not fully offset the gaps in mortality, chronic disease, and dental health.

Consistent and adequate insurance among children is associated with greater odds of receiving preventive care; rural-urban differences in insurance consistency and adequacy may contribute to rural-urban differences in the receipt of preventive primary and dental care.[18] Rural children are more likely to live in poverty than urban children as found in previous research.[9] High rates of poverty and inadequate access to affordable, nutritious food have been associated with worse health outcomes and poor child development.[19,20] There is also evidence of an association between socioeconomic status, food insecurity, and poor dental health such as untreated cavities.[21,22] The higher rates of poverty and food insecurity experienced by rural children may be associated with the greater likelihood of poor health outcomes that were present among rural children in this study including general health status, lifelong health problems, general tooth condition, and presence of cavities.

Rural children are more likely to receive care within a medical home than urban children. Previous research has found that children receiving care within a medical home are more likely to have received preventive care and are less likely to report difficulty in obtaining services.[18] Therefore, the higher likelihood of receiving care in a medical home among rural children may explain why there are no rural-urban differences in reported difficulty obtaining specialist care. This may also be why getting needed mental health care was easier for rural children in this study as care coordination was seemingly more common for rural children. Rural children were less likely to experience preventive primary and dental care which are critical to promoting well-being and preventing negative health outcomes.[23] Increasing access to preventive care for rural children and utilization of preventive services, through school-based health care, is likely to result in improved health for rural children. Previous research has shown that school-based care is particularly important in rural communities with rural children more likely than urban children to use school-based health services.[24] School-based health centers are associated with an increase in the utilization of preventive health care and a reduction in income-based differences in health care use.[24-27] The higher number of ER visits among rural children but the lack of difference in the number of hospital admissions may suggest that rural children are seeking preventive or non-emergent care in emergency settings due to the lack of available ambulatory care. The high prevalence of HPSAs in rural areas, higher prevalence of children who have forgone needed medical care due to lack of availability, and the lower prevalence of preventive care among rural children suggest that access to care remains a central challenge for rural communities. These results highlight the need for interventions aimed at increasing the rural health workforce such as expanding loan repayment and scholarship programs targeting pediatric, dental, and mental health providers in the joint shortage areas shown in our results. Rural children were also less likely to have used telehealth services in the past year. Given the potential of telehealth to overcome many challenges associated with accessing care in rural communities, further investment in broadband and telehealth infrastructure could greatly improve access to care and health outcomes for rural children.[28]

Rural children are less likely to have certain household safety measures in place such as having a working smoke detector or carbon monoxide detector. Previous research suggests that costs may be a barrier to these safety measures for rural parents, and that carbon monoxide poisoning is associated with higher rates of hospitalizations and deaths among rural residents.[29-31] There is also evidence of an association between exposure to mold and diagnoses of asthma and rhinitis in children; higher rates of mold exposure among rural children could be associated with higher rates of chronic illness in this population.[32] Increasing access to household safety measures and reducing mold exposure among rural children could result in fewer costly emergency department visits and better lifelong health outcomes. Much of the research examining rural-urban differences in household safety measures and the consequences of not having those safety measures in place uses older data, and little of the literature examining the association between mold exposure and childhood health considers rurality; additional research using updated data and with an emphasis on rural children could be warranted.[30-32]

Compared to urban children, rural children are more likely to have all three of the whole child risk domains. This finding, in combination with the other structural, household, and personal risk factors for poor health that rural children experience, highlights the value of comprehensive interventions and programming aimed at improving the health and well-being of rural children. One such program is the Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV). Participation in MIECHV programming is associated with improved socioeconomic status, reduced exposure to household violence, improved parent-child interactions, and better coping strategies and parental behaviors, as well as better maternal mental and behavioral health.[34] The targeted implementation of MIECHV and other evidence-based programming could significantly improve the health of rural children.

Strengths and Limitations

This study has several strengths and limitations. First, it provides a comprehensive update of the health of rural children in the United States. Much of the previous literature was limited in scope, is largely centered around urban or inner-city children, or uses older data.[1-9] This study uses data from a wide range of sources and has large sample sizes making the study highly generalizable to the U.S. However, the use of multiple data sources means that it is not possible to directly quantify the association between the exposures of interest and the health outcomes examined in this study. This, in addition to the use of varying years of data from different data sources, means it is not possible to make any causal inferences in this study. Additionally, the use of multiple data sources means that multiple definitions of rurality must be used. Since all the data analyzed in this study comes from de-identified, publicly available data, the researchers are limited to the definition of rurality that was available in each data set. This further contributes to the inability to make direct comparisons. Some definitions of rurality lack granularity so within-rural comparisons are not possible. A list of all the definitions of rurality and the data set that they are applicable to is available in the Appendix. Many of the data sources rely on self-reported data which raises the possibility of recall and social desirability biases. For analyses examining rural-urban differences in child mortality, data from 2022 and after cannot be evaluated due to data suppression policies put into place by the National Center for Health Statistics.[34] Additionally, data suppression prevented the evaluation of specific causes of death so only all-cause mortality was able to be accurately analyzed for the years in which data was available.

APPENDIX

Data Sources

Data Source	Years of Data	Unit of Analysis	Rural-Urban Definition	Sample Size		Primary Variables
				Rural	Urban	
National Survey of Children's Health (NSCH)	2022-2023	Individual (Child)	Core-Based Statistical Areas Urban: Metropolitan Statistical Area Rural: Any area not a Metropolitan Statistical Area	17, 387	81,352	General Tooth Condition (Age 1-17); Cavities (Age 1-17); General Health Status; Lifelong Health Condition; Special Health Care Needs; Mental, Emotional, Developmental, or Behavior Problem; Child Flourishing (Age 0 to 5); Child Flourishing (Age 6 to 17); Obese (Age 6 to 17); Forgone Needed Mental Health Care (Age 3-17); Difficulty Getting Needed Mental Health Care (Age 3-17); Receive Care in Medical Home; Difficulty Getting Specialty Care; Forgone Needed Health Care; Care Not Received due to Service Not Available; Care not Received due to Cost Barrier; Whole Child Risk Domain; Working Poor Status; Poverty Status; Insurance Coverage; Insurance Coverage Type; Insurance Adequacy; Insurance Coverage Continuity; Neighborhood Safety; Food Security; Exercise/Play Sport/Physical Activity for 60 Minutes; Preventive Dental Visit; Received Fluoride Treatment (Age 1 to 17); One or More Preventive Care Visits During the Past 12 Months; Adolescent Well Visit (Age 12 to 17); Hospital ER Visits in the Past 12 Months; Hospital Admission; Telehealth; Dental Care in Past Year (Age 1 to 17); Children who Received Needed Mental Health Treatment (Age 12 to 17); Children who Received Specialty Care; Eye Exam
Survey of Income and Program Participation (SIPP)	2023	Household	Core-Based Statistical Areas Urban: Metropolitan Statistical Area Rural: Any area not a Metropolitan Statistical Area	27,366	150,569	Received SNAP Benefits; Skipped/Cut Meals Due to Money Issues; Received Food Assistance Other than SNAP
American Housing Survey (AHS)	2023	Household	Core-Based Statistical Areas Urban: Metropolitan Statistical Area Rural: Any area not a Metropolitan Statistical Area	2,680	2,304	Chemical Safety Storage; Covered Outlets; Gates on Accessible Stairs; Fence Around Outdoor Pool; Working Smoke Detector; Working Carbon Monoxide Detector; Indoor Air Quality; Safe Water; Issue with Running Water in Past 12 Month; Issue with Heat in Past 12 Months; Issue with Cold in Past 12 Months; Mold Exposure in Past 12 Months
Health Professional Shortage Areas	2026	County	Core-Based Statistical Areas Urban: Metropolitan Statistical Area Rural: Any area not a Metropolitan Statistical Area	1,962	1,186	Mental Health Provider Shortage Areas; Primary Care Provider Shortage Areas; Dentist Provider Shortage Areas

Centers for Disease Control and Prevention's Wide-ranging Online Data for Epidemiological Research Database (CDC Wonder)	2018-2021*	Individual	2023 National Center for Health Statistics (NCHS) Rural – Urban Classification Scheme Urban: Large Central Metro, Large Fringe Metro, Medium Metro, & Small Metro Rural: Micropolitan & Non-Core	11,170, 276	69,973, 443	All-Cause Child Mortality

* Data from CDC Wonder is currently available through 2024; however, due to data suppression techniques utilized from 2021 onwards, rural-urban differences were only able to be analyzed (and therefore presented in this study) from 2018-2021.

RHRC
Rural Health Research & Policy Centers
Funded by the Federal Office of Rural Health Policy
www.ruralhealthresearch.org

University of South Carolina
Rural Health Research Center

Funding: This project was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number #U1C45498, Rural Health Research Grant Program Cooperative Agreement. This information, content, and conclusions are those of the authors and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.

For more information about the Rural and Minority Health Research Center, contact the Director Dr. Elizabeth Crouch (crouchel@mailbox.sc.edu) or Deputy Director Dr. Peiyin Hung (hungp@mailbox.sc.edu).
Link to Brief

REFERENCES

1. Shonkoff JP, Boyce WT, McEwen BS. Neuroscience, molecular biology, and the childhood roots of health disparities: building a new framework for health promotion and disease prevention. JAMA. 2009;301(21):2252-2259. doi:10.1001/jama.2009.754.
2. Barker DJ, Osmond C, Forsen TJ, Kajantie E, Eriksson JG. Trajectories of growth among children who have coronary events as adults. N Engl J Med. 2005;353(17):1802-180916251536.
3. Nomura Y, Wickramaratne PJ, Pilowsky DJ, et al. Low birth weight and risk of affective disorders and selected medical illness in offspring at high and low risk for depression. Compr Psychiatry. 2007;48(5):470-47817707257.
4. Crouch E, Hung P, Benavidez G, Giannouchos T, Brown MJ. Rural-urban differences in access to care among children and adolescents in the United States. *J Rural Health*. Jan 2024;40(1):200-207. doi:10.1111/jrh.12769.
5. Crouch E, Abshire DA, Wirth MD, Hung P, Benavidez GA. Rural-Urban Differences in Overweight and Obesity, Physical Activity, and Food Security Among Children and Adolescents. *Prev Chronic Dis*. Oct 19 2023;20:E92. doi:10.5888/pcd20.230136.
6. Crouch E, Nelson J, Merrell MA, Martin A. The oral health status of America's rural children: An opportunity for policy change. *J Public Health Dent*. Dec 2021;81(4):251-260. doi:10.1111/jphd.12444.
7. 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*. Jan 2020;36(1):55-64. doi:10.1111/jrh.12366.
8. Crouch, E. & Leong, A.D. *An Ounce of Prevention: Addressing Disparities in Child Well-being*. 2025. https://www.unicefusa.org/sites/default/files/2025-05/An%20Ounce%20of%20Prevention.pdf
9. Probst JC, Barker JC, Enders A, Gardiner P. Current State of Child Health in Rural America: How Context Shapes Children's Health. J Rural Health. 2018;34 Suppl 1(Suppl 1):s3-s12. doi:10.1111/jrh.12222.
10. Bettenhausen JL, Winterer CM, Colvin JD. Health and Poverty of Rural Children: An Under-Researched and Under-Resourced Vulnerable Population. *Acad Pediatr*. 2021;21(8S):S126-S133. doi:10.1016/j.acap.2021.08.001.
11. CAHMI. *2023 National Survey of Children's Health Methodology Report*. 2024. https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2023-NSCH-Methodology-Report.pdf?utm_source=DRC_resources&utm_medium=codebook&utm_campaign=2022-2023_codebook.
12. US Census Bureau. SIPP Introduction & History. US Census Bureau. Updated August 16, 2022. Accessed February 27, 2026 https://www.census.gov/programs-surveys/sipp/about/sipp-introduction-history.html.
13. US Census Bureau. American Housing Survey (AHS) Methodology. US Census Bureau. Updated June 17, 2025. Accessed February 27, 2026. https://www.census.gov/programs-surveys/ahs/about/methodology.html.
14. US Census Bureau. 2023 National — Household Demographics — All Occupied Units. Accessed February 27, 2026 https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=00000&s_year=2023&s_tablename=TABLE8A&s_bygroup1=1&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=4.
15. HRSA. What is Shortage Designation? HRSA. Updated June 2023. Accessed February 27, 2026. https://bhw.hrsa.gov/workforce-shortage-areas/shortage-designation#hpsas.
16. HRSA. Health Workforce Shortage Areas: Health Professional Shortage Areas (HPSAs). HRSA. Updated June 25, 2025. Accessed February 27, 2026. https://data.hrsa.gov/topics/health-workforce/shortage-areas.
17. Centers for Disease Control and Prevention. CDC WONDER: About Underlying Cause of Death, 1999-2017. Accessed February 27, 2026. https://wonder.cdc.gov/controller/datarequest/D158;jsessionid=BA37DE3628CC4A41646306FC72DC
18. Mehmood G, Giannouchos TV. Health Care Utilization and Family Frustration: Do Health Insurance Coverage and Medical Homes for US Children Matter?. *Matern Child Health J*. 2025;29(9):1307-1317. doi:10.1007/s10995-025-04127-1.

19. Casey EG, Winsler A. Impacts of Food Insecurity on Child Development: Strengthening the Role of Childcare. *Nutrients*. 2025;17(15):2427. Published 2025 Jul 25. doi:10.3390/nu17152427.
20. Francis L, DePriest K, Wilson M, Gross D. Child Poverty, Toxic Stress, and Social Determinants of Health: Screening and Care Coordination. *Online J Issues Nurs*. 2018;23(3):2. doi:10.3912/OJIN.Vol23No03Man02.
21. Chi DL, Masterson EE, Carle AC, Mancl LA, Coldwell SE. Socioeconomic status, food security, and dental caries in US children: mediation analyses of data from the National Health and Nutrition Examination Survey, 2007-2008. Am J Public Health. 2014 May;104(5):860-4. doi: 10.2105/AJPH.2013.301699. Epub 2014 Mar 13. PMID: 24625141; PMCID: PMC3987603.
22. Hill B. Evaluating the association between food insecurity and dental caries in US children 1-19 years: results from the National Health and Nutrition Examination Survey (NHANES) 2013-2014. J Public Health Dent. 2020 Jan;80(1):14-17. doi: 10.1111/jphd.12345. Epub 2019 Nov 11. PMID: 31709533.
23. Moreno MA. The Well-Child Visit. *JAMA Pediatr*. Jan 1 2018;172(1):104. doi:10.1001/jamapediatrics.2017.4041.
24. Wade TJ, Mansour ME, Guo JJ, Huentelman T, Line K, Keller KN. Access and utilization patterns of school-based health centers at urban and rural elementary and middle schools. *Public Health Rep*. Nov-Dec 2008;123(6):739-50. doi:10.1177/003335490812300610.
25. Boudreaux M, Chu J, Lipton BJ. School-Based Health Centers, Access to Care, and Income-Based Disparities. *JAMA Netw Open*. Sep 5 2023;6(9):e2334532. doi:10.1001/jamanetworkopen.2023.34532.
26. Brunner WM, Han Z, Tennyson S, Fiduccia PC, Krupa N, Kjolhede C. Impact of Rural School-Based Health Centers on Asthma Management. *J Pediatr*. Feb 2025;277:114385. doi:10.1016/j.jpeds.2024.114385.
27. Zhang X, Tennyson S, Kjolhede CL, Brunner WM. School-Based Health Centers and the Utilization of Primary Care in Rural Communities. *Am J Prev Med*. Oct 2025;69(4):107962. doi:10.1016/j.amepre.2025.107962.
28. US Government Accountability Office. Health Care Capsule: Accessing Health Care in Rural America. Published 2023 May 16. https://www.gao.gov/products/gao-23-106651.
29. Zolotor AJ, Burchinal M, Skinner D, Rosenthal M; Key Family Life Project Investigators. Maternal psychological adjustment and knowledge of infant development as predictors of home safety practices in rural low-income communities. Pediatrics. 2008 Jun;121(6):e1668-75. doi: 10.1542/peds.2007-1255. PMID: 18519470.
30. Iqbal S, Law HZ, Clower JH, Yip FY, Elixhauser A. Hospital burden of unintentional carbon monoxide poisoning in the United States, 2007. Am J Emerg Med. 2012 Jun;30(5):657-64. doi: 10.1016/j.ajem.2011.03.003. Epub 2011 May 12. PMID: 21570230.
31. Hnatov MV. Non-fire Carbon Monoxide Deaths Associated with the Use of Consumer Products: 2018 Annual Estimates. Consumer Product Safety Commission. Directorate for Epidemiology. Division of Hazard Analysis; 2021.
32. Thacher JD, Gruzieva O, Pershagen G, et al. Mold and dampness exposure and allergic outcomes from birth to adolescence: data from the BAMSE cohort. *Allergy*. 2017;72(6):967-974. doi:10.1111/all.13102.
33. Portilla, Ximena A., Kristen Faucetta, Kelly Saunders, and Amy Taub. 2025. *Beyond the Early Years: The Long-Term Effects of Home Visiting on Mothers, Families, and Children. Results from the Mother and Infant Home Visiting Program Evaluation*. OPRE Report 2025-052. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.
34. Centers for Disease Control and Prevention. CDC WONDER: FAQs - How are small data values protected to avoid revealing the identities of individual people?. Accessed February 27, 2026. https://wonder.cdc.gov/wonder/help/faq.html#5.