

NRHA Policy Paper: Overview of Rural Child Health

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I. Introduction

Rural children experience worse health and health care outcomes than their urban peers.¹ Barriers to accessing quality health care exacerbate their health outcomes and pose significant challenges to achieving optimal health status.² Access and health disparity issues vary across rural communities, states, and regions, and many rural areas have few health care providers, especially pediatric specialists. This policy paper reviews the health status and environmental contexts of health disparities in rural children in the United States.

II. Definition of rural children

The US Department of Health and Human Service (HHS), Food and Drug Administration (FDA), and American Academy of Pediatrics (AAP) delineated the pediatric population into three distinct categories. The FDA and HHS define infancy as the time between birth and 2 years of life, childhood as the time between 2 years and 12 years of life, and adolescence as the time between 12 years and 21 years of life. The AAP has similar delineations with the exception that adolescence is identified as between 13 years and 21 years of life.³ Across all definitions, the upper limits of childhood and adolescence are the 21st year of life.

Utilizing the definitions provided by HHS, FDA, and AAP, as well as the rural/urban dichotomy defined by the United States Department of Agriculture, rural America contains approximately 11.8 million children and adolescents.⁴ The demographic composition of rural children and adolescents shows a predominance of non-Hispanic white children (71.8 percent), with Hispanic (11.9 percent), non-Hispanic black children (9.4 percent), Asian (0.9 percent), and “other” (6.1 percent) comprising the remainder (Probst, Barker, Enders, & Gardiner, 2018). The issues presented in this brief affect a significant number of diverse people across the United States.

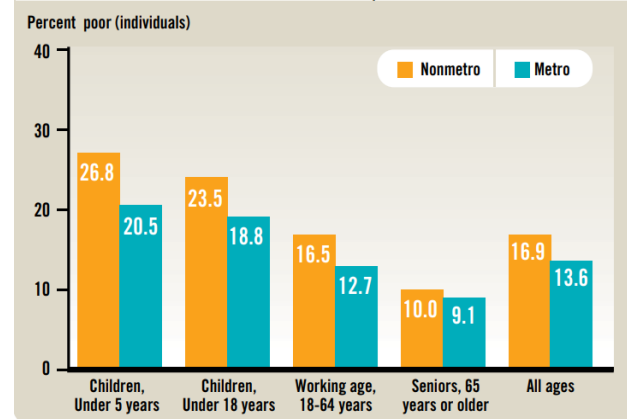
III. Contextual factors in rural child health disparities

Economics

Children’s health is influenced by where they live. Compared to rural adults, rural children are more likely to be poor (Figure 1).⁵ Across rural America, 24 percent of children lived in poverty in 2016 compared to 17 percent of adults. In the same year, 27 percent of children under age 5 lived in poverty.⁵

Economic hardship in rural communities results from a declining population, limited employment opportunities, and insufficient investments by industry. In recent years, despite developments in the economy from 2011 to 2018, rural communities lagged behind their urban counterparts.⁶ As of 2015, rural counties dominated among counties with persistent poverty (82 percent), low employment (86.1 percent) and low education (80.2 percent).⁷ Of the top 100 counties that had the highest childhood poverty rates in 2014, 95 percent were rural.⁷

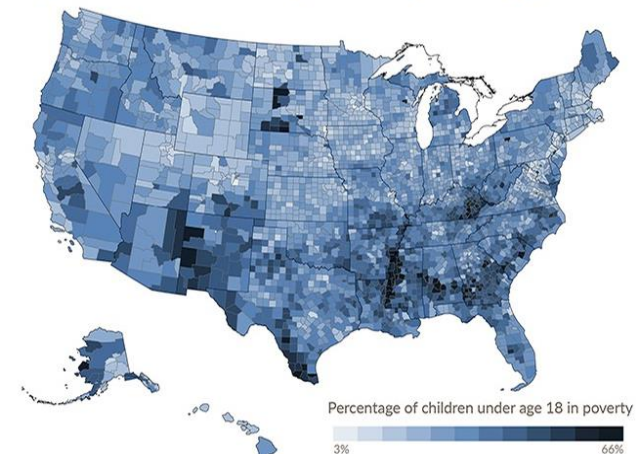
Figure 1. Poverty Rates by Age Group and Metro/Nonmetro Residence. 2016



Source: USDA, Economic Research Service using data from the U.S. Census Bureau, American Community Survey, 2016.

According to 2016 American Community Survey data, across counties by rurality, rural counties continue to have the highest child poverty rates (23.2 percent), followed by large urban metro (21.2 percent), smaller metro (20.5 percent), and suburban counties (14.5 percent) (Figure 2).⁵ Growing up poor may lead to delayed immunizations, low academic achievement, and high delinquency rates in adolescence.⁸ The persistently high child poverty rates in rural communities may have long-term detrimental effects on health.

Figure 2. Child Poverty Rates by County, 2016



Health care access and quality

Gaps in health care accessibility and quality in rural communities are matched by lack of preventive care and health disparities facing rural children.⁷ Probst and colleagues (2018) noted that rural parents are less likely than urban parents to report their child has had a preventive health care or oral health care visit.⁷ Several factors influence health care access, including insurance coverage, provider workforce, travel burdens such as road conditions, and transportation.

Insurance

As of 2017, nearly all children in both rural and urban areas had full-year health insurance coverage.⁹ However, Hispanic children remained less likely to be insured



than their non-Hispanic peers. Medicaid and State Children's Health Insurance Programs played an essential role in rural America, as the proportion of rural children with such public coverage increased from 30 percent in 2003 to 45 percent in 2015.^{10,11}

Access to health insurance does not equate to access to quality health care. The benefits of health insurance on child health have been well documented, yet disparities between children with public and private insurance persist. In the 2015 National Health Interview Survey, children with Medicaid coverage in both rural and urban communities were more likely to experience barriers to care or unmet health needs.⁹ These barriers included difficulty getting an appointment, locating a general clinician, and finding a provider accepting Medicaid insurance.¹⁰ In another study, rural children suffering mild traumatic brain injuries were more likely than their urban counterparts to have physical or occupational therapy but less likely to use speech therapy, psychiatry/psychology, or follow-up outpatient services after their surgeries.¹² When rural children were able to receive follow-up care, total health care costs during the 180 days post-surgery were 11 percent greater than those for urban children.¹²

Provider workforce

High-quality health care for rural children requires access to essential health care services, as well as a workforce prepared to address the unique health care needs of the pediatric population. While 20 percent of American children live in rural communities, in 2015, only 9 percent of general pediatricians practiced in those areas.¹³ In some rural areas, the prevalence of pediatricians and family physicians is 22 for every 100,000 children, or 4,500 children per physician.¹⁴ In addition to pediatricians, nurse practitioners (NPs) and physician assistants (PAs) play significant roles in rural pediatric primary care workforce.¹³ Despite a rapidly growing supply of NPs, only 9 percent of NPs specialize in pediatrics, with an additional 49 percent specializing in family care.¹⁵ PAs also provide specialty care. Of 123,500 nationally certified PAs, 2.4 percent practice general pediatrics, and 1.6 percent practice in pediatric subspecialties.¹⁶

The uneven distribution of the pediatric workforce – including pediatricians, family physicians, NPs, and PAs – has yielded disproportionate travel burdens for rural children and their caregivers. In 2010, more than 10 million children had to travel more than 60 miles to a pediatric surgeon.¹⁷ Since then, the proportion of surgical pediatric residency graduates seeking jobs in rural communities is in decline, potentially yielding worse accessibility to pediatric surgical care among rural children. Compared to urban children, rural children were more likely to live more than 60 miles from the nearest pediatric surgeon (34 percent vs. 10 percent).¹⁷ More than half of rural children live more than 40 miles away from any pediatric surgeon.¹⁷ Probst and colleagues (2018) found that among youth with psychiatric diagnoses visiting hospital emergency departments, rural residents were more likely to be hospitalized after controlling for clinical need, suggesting a lack of effective outpatient treatment.⁷ Optimizing access to



specialty or general primary pediatric care may require strategies to overcome long geographic distances in rural and underserved areas.

Travel burdens and transportation

Substantial travel distances to care may compound disparities in child health outcomes among children in poverty, especially when they lack access to transportation. When long travel distances become necessary, transportation becomes vital for these children to access medical appointments and health care.^{18,19} Transportation barriers are the top reason for delayed care and unmet medical needs for rural children. Indeed, in the 2017 National Survey of Child Health, transportation issues were the primary barrier for not receiving health care for 15 percent of rural children compared to 11 percent of urban children.²⁰ Many nonprofit agencies have implemented transportation resources for low-income families.^{21,22} One such example is Kid One Transport in Alabama. Since the program launched in 1997, Kid One Transport has served more than 385,000 children and pregnant women. The program has reduced emergency room visits and improved overall health and well-being for these rural children.²³

Risk factors for injury in rural children

Injuries are the leading cause of death among children.⁷ Environmental factors may facilitate injuries, leading to disparities in health outcomes for rural children.²⁴ Vehicle crashes, a leading cause of death in children, are more likely to be fatal in rural counties due to higher speeds, lower-quality road design,²¹ and greater distances to hospitals. Rural areas tend to have higher rates of firearm suicide and unintentional death from firearms than urban areas.^{24–27} Farm machinery also increases the risk for injury among farm children. In 2014, approximately one million children under 20 lived on a farm and more than half performed farm work.²⁸ Every three days, a child dies in an agricultural accident.²⁹ Rural communities have lower levels of injury prevention behavior, such as seatbelt use, water safety practices, and use of bike helmets.⁷ Despite well-documented evidence on the use of seat belts to prevent death in motor vehicle crashes, rural children are less likely to use seat belts (76 percent) than their urban peers (86 percent).³⁰

Family/physical environment

The physical environments where many rural children develop are associated with poor health outcomes. Rural children are more likely than urban children to be exposed in utero to maternal smoking and be born to teen mothers. In the preschool years, rural children are more likely to have both parents working outside of the home and less likely to have access to formalized preschool/daycare than urban children.

Probst and colleagues (2018) reported that over the course of childhood, rural children are more likely than urban children to be raised in homes classified as having



“moderately or severely inadequate living conditions.”⁷ Such living conditions include homes that do not have running water or smoke/carbon monoxide detectors. Probst and colleagues (2018) attributed these deficiencies to poverty rather than lack of awareness. In 2014, a household member smoked inside the home in about 15 percent of rural families compared to 9 percent of urban families.⁷

Families in rural communities and those classified as racial minorities face stress from poverty, racism, and discrimination, as well as accompanying family stressors. Economic pressures and emotional distress may negatively impact the health of children over time.³¹ Rural children also had a higher frequency of adverse childhood experiences (ACEs) than their urban peers.³² These experiences are significant disturbances in a child’s life that affect a sense of security and ability to function in healthy ways. ACEs include all forms of child abuse (emotional, physical, or sexual), neglect (physical or emotional), and household dysfunction (divorce, violence, incarceration, substance abuse, or mental illness). In the 2016 National Survey of Children’s Health, rural children were more likely than urban children to be exposed to parental separation/divorce, parental death, family economic hardship, violence in the household, incarceration of a household member, mental illness in a household member, or substance abuse by a household member.^{20,32} In the same year, 7 percent of rural children experienced at least four ACEs compared to 3 percent of urban children.³²

IV. Health and health care disparities

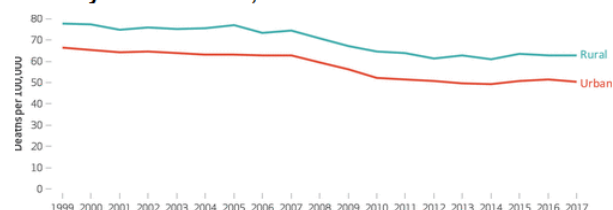
Overall health

Rurality is associated with an increased risk for overall morbidity and mortality.³³ This increased risk appears across the full spectrum of pediatrics, including infants, children, and adolescents. In general, rural children are more likely to be affected by neonatal abstinence syndrome; have visual, hearing, or learning disabilities; be under-vaccinated; be obese; be more likely to engage in unsafe sexual practices; and be more likely to experience adolescent pregnancy.^{7,29,34–36} These will be discussed in more detail in the following sections.

Mortality

Rural infants and children experience higher rates of all-cause mortality than their urban counterparts,^{33,37} even after adjusting for local socioeconomic status (Figure 3.)

Figure 3. Deaths per 100,000 Population among Children and Adolescents Ages 0-19, by Rurality of County of Residence, 1999-2017

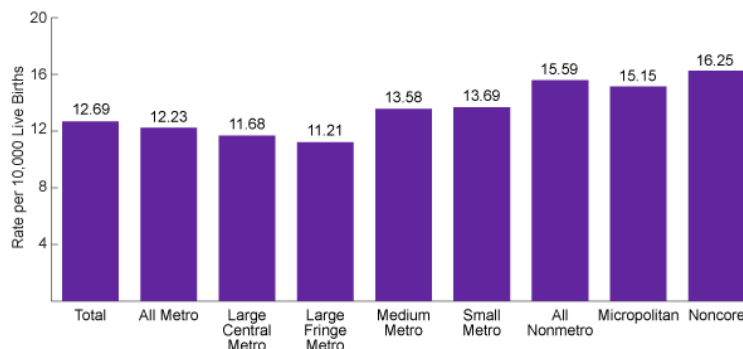


Source: Probst, J., Zahnd, W., & Breneman, C. (2019). Declines in pediatric mortality fall short for rural US children. Health Affairs, 10-1377.



Annually, approximately 22,000 infants die in the United States. The leading causes of these deaths are birth defects, preterm births, low birth weights, sudden infant death syndrome, and injuries.³⁸ Rural infants are more likely to experience these causes of death than urban infants. In 2011, rates of infant death due to birth defects were 16 per 10,000 live births in rural noncore areas and 12 per 10,000 live births in urban areas (Figure 4).³⁹

Figure 4. Infant Mortality Rates due to Birth Defects per 10,000 Live Births, by Urban/Rural Residence, 2011



*Infant deaths at less than 1 year of age with an underlying cause-of-death ICD-10 code of Q00–Q99. **Based on: Ingram DD, Franco SJ. 2013 NCHS urban–rural classification scheme for counties. *National Vital Health Statistics*. 2014;2(166). Available at: http://www.cdc.gov/nchs/data_access/urban_rural.htm. Accessed October 7, 2014.

Source: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying cause of death 1999–2011. CDC WONDER Online Database. 2014. Available at: <http://wonder.cdc.gov/ucd-icd10.html>. Accessed October 1, 2014.

Despite a decreasing trend of all-cause mortality rates in the past two decades, rural children and young adults remain vulnerable. The major causes of death in children and adolescents include motor vehicle accidents, firearm-related injury, cancer, suffocation, drowning, and drug overdose/poisoning.²⁸ Some of these causes are particularly prevalent in rural children, given their exposure to agricultural machinery, long distances from emergency department care, and unsafe road designs.^{7,40}

Physical health

Rurality is associated with neonatal abstinence syndrome (NAS).³⁴ With the recent increase in opioid use and abuse in rural counties, NAS has also become more common. The incidence of NAS increased in rural counties from 1.2 percent of births in 2004 to 7.5 percent of births in 2013, a rise higher than in urban counties.³⁴

In school-age children and adolescents, rurality is also associated with several chronic diseases or unhealthy practices that lead to poor health outcomes. In 2015, children and adolescents who lived in rural counties or USDA-designated rural areas had a 26 percent greater chance of being obese.⁴¹ Rural children and adolescents also have higher rates of physical activity than their urban counterparts.⁴¹ The overall rate of



disability, including vision, hearing, cognitive, or ambulatory disabilities, is 6 percent higher in absolute terms in rural children than urban children.⁷

Rural residence may protect somewhat against asthma. Children raised in rural counties have a lower incidence of atopic diseases including asthma, eczema, and severe allergies than children in urban counties.⁴² However, obesity is an independent risk factor for asthma, and rural areas where rates of obesity far outpace urban areas also have rates of asthma higher than urban areas.⁴³

Preventive health

Rates of vaccination are lower in rural areas than urban areas, with particularly stark differences for vaccines usually given in adolescence. From 2015 to 2016, rural adolescents had rates of up-to-date human papillomavirus and meningococcal vaccinations that were 15 and 20 percent lower than urban adolescents, respectively.⁴⁴

Alcohol and illicit drug use is more common in rural adolescents than their urban counterparts. In one study, rural adolescents had 121 percent higher odds of drinking in the past 12 months than urban adolescents.⁴⁵ This is paralleled by increased alcohol use and abuse by rural parents. Parents in rural areas were 63 percent more likely to engage in frequent heavy drinking and had a 52 percent higher likelihood of weekly drinking and a 37 percent higher likelihood of drinking at home than urban parents.^{45,46} Adolescents living in rural communities had 287 percent higher odds of obtaining alcohol from parents than urban adolescents.³⁶ In two studies, adolescents living in rural areas were more likely to have used alcohol, tobacco, cannabis, or other illicit drugs in the past 30 days when compared to urban adolescents.^{45,47}

From 2009 to 2011, rates of adolescent pregnancy and sexually transmitted infections were higher in rural areas than urban areas.⁴⁶ Rural adolescents also had a correspondingly lower rate of condom use and decreased access to comprehensive sexual education than urban adolescents.⁴⁸

Oral health

Historically the evidence on oral health disparities between rural and urban children has been mixed.^{7,35,49} While parental perceptions of child oral health did not differ between rural and urban areas,⁴⁹ rural children had higher rates of dental caries and other oral problems.³⁵ In more recent studies, rural residents had lower oral health literacy including poor oral hygiene and difficulty navigating oral health care than urban residents.^{50,51} Without effective interventions in rural communities, low oral health literacy among rural residents might transmit from one generation to another, yielding poor oral health in rural children.

Mental, behavioral, and developmental disorders



Mental, behavioral, and developmental disorders (MBDDs), such as attention-deficit/hyperactivity disorder (ADHD), anxiety, depression, and autism spectrum disorder, are often first diagnosed in early childhood. Rural children had a slightly higher incidence of MBDDs than urban children.^{7,52,53} Children in rural areas had a higher prevalence of such diagnoses (18.6 percent) than children in urban areas (15.2 percent).⁵² In the 2016 National Survey of Children's Health, approximately one in five young children 2 to 8 years old in rural areas had a parent-reported MBDD diagnosis.⁵² Risk factors for MBDDs were similar for rural and urban children, including the lack of a medical home, a parent with poor mental health, family financial difficulty, and the lack of physical and social resources.⁵² Rural children were also more likely than their urban counterparts to have a parent with poor mental health and to live in a low-resource neighborhood. No differences were noted in access to insurance coverage among children with MBDDs.⁵² The most commonly diagnosed MBDDs are ADHD, anxiety, depression, and behavioral disorders. While most rural-urban prevalence of these commonly diagnosed MBDDs are outdated, a recent CDC-led study using 2016 data showed a higher prevalence of ADHD among rural (11.8 percent) vs. urban (9 percent) children aged 2 to 17 years.⁵³

Despite a slightly higher incidence of MBDD, rural children are less likely to use MBDD services than urban children.⁵⁴ The limited accessibility of mental health care has also raised concerns on children and youths who had suicidal ideations.²⁷ Suicide was the second leading cause of death for youth age 10 to 24 in 2017 in the United States.⁵⁵ From 1996 to 2010, suicide rates among individuals aged 10 to 24 years increased more in rural areas than in urban areas. This disturbing trend has called for multidisciplinary teams of behavioral professionals, health care providers, and educators to address mental health access among children in rural America, where residents often get mental health care in primary care settings.⁵⁶

V. Next steps and policy suggestions

This paper describes a range of risk factors and the status of rural child health, which are essential to guiding policy recommendations. Prior work has used a four-level social-ecological model that not only recognizes the interplay between four distinct levels of influencers (individual, relationship, community, and societal) but reinforces the importance of acting across all ecological levels simultaneously. In addition to the policy recommendations outlined below, NRHA recognizes the importance of a continued and sustained effort to investigate the range of factors that influence rural child health outcomes and bringing forward additional policy recommendations that consider all four social-ecological levels.



To address health disparities across their life spans from infancy to early adulthood, NRHA suggests a multifaceted approach with the following policy considerations at state and federal levels:

- **Care coordination:** 1) Develop life course case management approaches and family-centered medical homes to coordinate care across different settings and between local and distant health care markets for rural children with special health needs. 2) Support the integration of behavioral health, oral health, and primary care in health professions training programs, rural health grant programs, and Medicaid programs. (3) Regionalization of neonatal and pediatric care through accountable care organizations, hospital networks, pediatrics practices so primary care providers can yield economies of scale and improvements in quality as children are increasingly cared for by specialists in pediatric settings.
 - In the short-term, NRHA supports:
 - Rural Hospital Closure Relief Act (H.R. 5481/S. 3103)
 - Rural Physician Workforce Production Act (S. 289)
 - Improving Access to Care in Rural and Underserved Areas Act (S. 3194)
- **Community viability:** Emphasize community health and wealth-building opportunities to create capacity for stable rural communities.
- **Cross-sector engagement:** Engage cross-sector rural child health professionals – such as educators, providers, rural families, and community partners across multiple sectors – to identify rural-specific barriers and facilitators for children’s preventive, oral, and mental health care and address associated factors.
- **Evidence-based programs:** Leverage and expand evidence-based programs such as Healthy Start and home visiting programs to prevent adverse childhood events and understand the barriers and facilitators of these programs.
- **Insurance:** Improve access through Medicaid coverage and rural community service providers to opioid prevention and treatment services for rural women and infants and avoid discontinuity of Medicaid coverage for vulnerable children.
 - In the short-term, NRHA supports continued funding for the 340B program for rural providers and protecting funding for Medicaid.
- **Research funding:** Tailor funding resources to support research and focus on rural children to include:
 - Ongoing surveillance and research data for identifying vulnerable rural children and communities.
 - Identify evidence-based quality of pediatric care measures to improve the health and well-being of rural children.



- **Transportation services:** Support robust rural transportation systems to alleviate barriers and increase access to care, regardless of geographic location. Ensure rural families of children with special health needs have universal access to non-emergency transportation services to health care providers across all states under Medicaid and SCHIP programs.

- **Technology access:** 1) Support expansion of telehealth and telemedicine infrastructure (such as broadband and mobile health) to increase access to services. 2) Leverage the Health Information Technology for Economic and Clinical Health Act to integrate electronic health records systems and health information exchange functionality to increase use of pediatricians and/or physician assistants.
 - In the short-term, NRHA supports:
 - Rural Health Clinic Modernization Act (H.R. 2788/S. 1037)

- **Transition of care:** Leverage existing educational and health care resources to improve transition of care throughout childhood. In both school and primary health care settings, improve services to rural children by equipping children and their families with the knowledge and skills necessary to promote self-efficacy, wellness, and successful transition from secondary school to postsecondary life.



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