Rural HEALTHY People 2030
Geography should not be a determining factor for health status. For 46 million people living in rural America today, health policy, research, and public health measures must focus on the goal of achieving equity. Rural America is not simply a small version of urban, but rather a unique healthcare delivery environment. Across hundreds of small towns and farms today, we see a population that trends older, with greater health disparities, and often lacking both access to care as well as financial resources to address their health concerns. Public health, in this environment, becomes a national imperative and a necessary focus of the nation. Rural America can lead a national transformation to a better, healthier community-based approach in the next decade. This, however, requires an understanding of both the population as well as an understanding of the unique challenges of rural life. A thoughtful path forward, with both data-based goals and measures, can ensure that rural America continues to lead in innovative care models and quality of life for future generations.

— Alan Morgan*
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Printed in the United States of America
Newman Printing Company, Inc., Bryan, Texas

This publication was supported through a grant from the Texas A&M Health Science Center Seedling Grant Program.

Suggested Citation: Ferdinand AO, Bolin JN, Callaghan T, Rochford HI, Lockman A, Johnson NY. Rural Healthy People 2030. College Station, Texas: Texas A&M University School of Public Health, Texas A&M Health Southwest Rural Health Research Center; 2023.


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Library of Congress Control Number: 2023917310
ISBN 979-8-218-27745-1
Rural Healthy People began in the early 2000s as the rural counterpart to the national Healthy People initiative – the set of ten-year objectives for improving health and well-being. Building upon insights gained from Rural Healthy People 2010 and 2020, this third iteration provides a deep dive into the pressing public health concerns identified by those living in rural America. This book outlines the priorities determined by rural stakeholders, provides context, and discusses potential policy and programmatic solutions. Although rural America can often be referred to as a monolith, each rural community has its own unique needs and strengths. While there will never be a one-size-fits-all approach to rural public health and health care, this initiative will inform stakeholders and policymakers as they prepare for a new decade.

Much has changed in the rural health care landscape since Rural Healthy People 2020. Despite the many challenges that each new decade presents, new policies, programs, and payment models show promise to better serve rural needs. Congress established the Rural Emergency Hospital designation in December 2020 in response to the loss of essential health care services in rural areas due to hospital closures. Congress and the Administration have also taken steps to improve access to mental health care. In 2023, the Centers for Medicare & Medicaid Services simplified supervision for auxiliary behavioral health professionals. In 2022, Congress expanded future Medicare coverage and payment to include marriage and family therapists and mental health counselors. Beginning in 2024, these professionals will be able to bill directly for mental health services, creating new service options to meet mental health needs in rural communities. The Health Resources and Services Administration’s Rural Community Opioids Response Program (RCORP) has ensured that there is a rural focus in the larger national effort to address the ongoing opioid and related substance use epidemic. Since Fiscal Year 2018, RCORP has received $720 million in appropriations and served over 1,800 rural counties across 47 states and two territories.

Rural Healthy People 2030 continues to provide frameworks for addressing rural health care challenges, benchmarking progress, and identifying solutions. Each chapter in this book tackles a rural health care priority, as identified by rural stakeholders. I am eager to see this book be used by policymakers, by organizations, and by individuals supporting rural communities. This book acts as a roadmap as we accelerate progress on these priorities and craft policies and programs that have rural needs at the center.

Tom Morris

Associate Administrator
Federal Office of Rural Health Policy
Health Resources and Services Administration
Dear Readers,

Our country is in a vastly different place today than when the 2020 and 2010 editions of Rural Healthy People were produced. As the world emerges from the COVID-19 global public health emergency, we take stock of how this pandemic has changed us. The COVID-19 pandemic laid bare the stark reality of inadequate healthcare access in rural America from years of facility closings and the difficulty in retaining healthcare practitioners. It also showed us the vulnerability of the patchwork systems used to disseminate health information to the general public, and its susceptibility to misinformation.

The goal of Rural Healthy People 2030 remains unchanged from the 2020 and 2010 editions. This latest edition serves as a resource for translating the current state of rural health priorities and disparities in America, identified through the national Rural Healthy People 2030 survey, and as a roadmap for federal and state leaders. The Texas A&M University School of Public Health, through our Southwest Rural Health Research Center, remains committed to improving rural health and reducing health disparities. We serve as the dedicated steward of the Rural Healthy People initiative with a continuing aim to supply and summarize the vital information generated from the survey so that it can be utilized by decision makers, advocates, and representatives of rural America. Drs. Alva Ferdinand, Jane Bolin, Timothy Callaghan, and a resolute team of researchers and support staff have collaborated broadly in order to execute and bring you the most up-to-date literature on each priority topic and place these results into the context of ever-evolving health priorities within rural America.

Results of the Rural Healthy People 2030 survey reflect our time. “Mental Health and Mental Disorders” and “Addiction” rank first and second, which had not occurred in any previous Rural Healthy People survey. “Health Care Access and Quality” moved from the top priority for 2020 to the third priority for 2030; however, all of the top three priorities are heavily intertwined. The opioid crisis and the COVID-19 pandemic have exasperated already frayed mental health and addiction service systems within the rural areas of our country, which already lacked access.

There is hope and there are opportunities to address rural health disparities. This Rural Healthy People 2030 volume is provided to you in the belief that it can positively impact the lives of individuals and communities within rural America. Armed with the information contained in this document, policy and decision makers, advocates, and practitioners can work to adjust existing programs and leverage new and existing state and federal resources to create programs that better support the promotion and protection of health in the communities where rural Americans live, learn, work, and play.

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ACKNOWLEDGEMENTS:

The authors wish to gratefully acknowledge the diligent editorial skills of Texas A&M University School of Public Health graduate student Gracie Woodland. Many thanks to the talented Jessica Preston at Aggieland Printing for page design and layout. The superb cover art was created by graphic designer Juliana Seale in the Texas A&M Health Office of Marketing and Communications, Melany Borsack, Director.

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This publication represents a commitment by the Texas A&M University School of Public Health, originally the nation’s only school of rural public health, to position rural America at the forefront of public health policy considerations. In 2020, approximately 60% of all counties in America were considered rural, constituting a population of roughly 46 million people. Rurality brings with it a unique set of health care challenges and opportunities.

While the federal government’s Healthy People program establishes specific goals to improve the health and well-being of all Americans, each decade our team at the Southwest Rural Health Research Center (SRHRC) has looked at those goals and objectives in light of their importance to rural Americans. The SRHRC produced a collection of literature reviews on these important rural health topics, known as *Rural Healthy People*, in 2010, 2020, and with this volume – 2030. The basis for each publication has been a nationwide survey of rural stakeholders who have used Healthy People’s leading health topics to establish a rank order of priority health concerns for rural Americans. Detailed results of our most recent survey of national stakeholders have been presented in webinars, peer-reviewed publications, and a policy brief funded by the Health Resources & Services Administration’s (HRSA’s) Federal Office of Rural Health Policy.

Reflecting the ever-changing landscape of rural healthcare, Table 1 reveals several shifts in rural priority concerns over the last ten years. It should be noted that many of the Healthy People 2030 topics from which survey respondents selected, were not included in Healthy People 2020 as stand-alone topics.

### Mental Health and Substance Misuse Identified as Leading Concerns

Seen as the most dramatic shift over the last decade, mental health concerns and issues surrounding substance misuse have moved to the forefront of rural health concerns. The topic of Mental Health and Mental Disorders was identified in our current survey as the number one health concern for rural Americans, up from fourth place in our survey a decade earlier. The current prioritization of mental health issues was followed closely by topics related to substance misuse including: Addiction (ranked #2), Drug and Alcohol Use (ranked #5), and Chronic Pain (ranked #20). Increasing Importance of Social Determinants of Health

Another shift from ten years earlier has been increasing recognition of the important role that social determinants of health (SDoH) play in the health of individuals and communities. The SDoH premise is that the condition of an individual’s environment greatly impacts their health outcomes and quality of life. Healthy People 2030 generally identifies SDoHs in five domains: Economic Stability, Education Access and Quality, Health Care Access and Quality, Neighborhood and Built Environment, and Social and Community Context.

New SDoH topics, not presented for ranking a decade earlier, were highly ranked in our current survey results; that is, Economic Stability was ranked #10, Transportation (#11), and Housing and Homes (#14). The topic Education Access and Quality was ranked as the 16th highest health-related priority for rural residents. These top 20 topics had previously been grouped into more generalized categories a decade earlier, such as Education and Community-based Programs (#12 in Rural Healthy People 2020), Quality of Life and Well-Being (#14 in RHP 2020), and the broad topic of Social Determinants of Health (#19 in RHP 2020).

### Topics Not Repeated in the Current Top 20

Notably, eight of the top 20 topics in the Rural Healthy People 2020 survey, were not ranked in the top 20 in the Rural Healthy People 2030 survey. These include: (1) Heart Disease and Stroke, (2) Physical Activity and Health, (3) Maternal, Infant, and Child Health, (4) Tobacco Use, (5) Oral Health, (6) Immunizations and Infectious Disease, (7) Family Planning and Sexual Health, and (8) Injury and Violence Protection.
Nevertheless, content related to these eight topics is still reflected in our latest rankings and in our chapters. For example, content related to rural Physical Activity and Health (a top 20 topic in Rural Healthy People 2020) is included in the current Overweight and Obesity chapter. Data on Oral Health are presented in our current Preventive Care chapter. An important discussion on prenatal care, previously reported in the Maternal Infant and Child Health chapter a decade ago, can be found in the Preventive Care chapter.

**Access to Quality Health Services**

One decade ago, 76% of our survey respondents identified Access to Quality Health Services as a top 10 concern, making it the highest-ranked rural health priority. Areas identified as access-related sub-priorities included health insurance, primary care, and emergency medical services. In the current Rural Healthy People 2030 survey, all four of these topics were identified independently and received top 20 rankings; that is, Health Care Access and Quality was ranked #3 overall; Health Insurance (ranked #17); Preventive Care (ranked #7); and Hospital and Emergency Services (ranked #19).

**Impact of COVID-19 Pandemic and ACA**

To say that the COVID-19 pandemic has changed health care in rural America would be a significant understatement. The increased use of telehealth, awareness of the digital divide, rural hospital closures, provider burnout, and loss of employer-sponsored insurance are just some of the topics to be discussed in these pages, in light of the COVID-19 experience. The 10-year impact...
of the Affordable Care Act, including Medicaid expansion and after non-expansion, has also undoubtedly affected rural healthcare coverage and will be addressed in many of our chapters.

Acknowledgement

This Rural Healthy People 2030 volume was a labor of love for many. More than 1,200 rural stakeholders participated in the online survey to determine the current top 20 priorities that informed the 20 chapters of this book. More than 65 individuals, faculty and graduate students representing a dozen different institutions, contributed their time and expertise to the writing of this volume. It is our hope that these literature reviews will serve as a guide to support policymakers, providers, and rural stakeholders as they plan for a bright and improved future for rural communities.

Sincerely,

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MENTAL HEALTH AND MENTAL DISORDERS: A RURAL CHALLENGE

By Carly E. McCord, PhD; Kala M. Phillips Reindel, PhD, MS; Kelly Sopchak, PhD, LSSP; Mariah Stickley, PhD; and Meredith Williamson, PhD

SCOPE OF THE PROBLEM

• The Rural Healthy People 2030 survey of rural stakeholders ranked Mental Health and Mental Disorders as the number one rural health priority.1

• The past year prevalence of serious mental illness was significantly higher in nonmetropolitan areas (i.e. rural) where individuals cite significantly greater problems accessing mental health care due to transportation issues.2

• Fewer than 20% of nonmetropolitan adults with depression received treatment from a mental health professional with most receiving medication-only treatment from a general practitioner or family doctor.3

• There has been a shift in mental health professional shortage areas (MHPSAs) since Rural Healthy People 2020 with the percentage of federally designated MHPSAs in rural or partially rural areas dropping from more than 85% to just under 68%.4

• Suicide rates remain highest in rural areas. Suicide rates peaked in 2018 and have declined overall in 2019 and 2020; but, concerns exist about the impact of COVID-19 such as social isolation, economic hardship, and loss of loved ones.5

• Youth in rural areas are dying by suicide at almost double the rate (1.8x) of their urban peers.6

• Adverse childhood experiences (ACEs), which are known contributors to mental health and substance use concerns, are more likely to occur for youth in rural areas. These youth also have significantly fewer positive childhood experiences (PCEs) to combat the negative effect of ACEs.7

Mental health touches every aspect of our lives and health and is shaped by individual, family, community, environmental, and societal factors.8 Mental health includes emotional, psychological, and social well-being.9 Mental disorders significantly impair our functioning in one or more areas and the symptoms are defined by the International Statistical Classification of Diseases and Health Related Problems and/or the Diagnostic and Statistical Manual of Mental Disorders.10,11 Mental disorders are often categorized as any mental illness (AMI) or serious mental illness (SMI) based on the severity of the impairment caused by the disorder.12 The prevalence for adults is 21% for AMI and 5.6% for SMI. Rates are higher for females and decrease across the lifespan.12

For children and adolescents, mental health conditions are the leading cause of disability and poor life outcomes. One in five children ages three to 17 in the United States report having a mental, emotional, developmental, or behavioral disorder.13 Recent surveys show major increases in some mental health symptoms including depression and suicidal ideation, attempts, and completions, as well as increases in youth psychiatric visits to emergency departments for mental health concerns.14-16

Nearly half of all U.S. adults and kids go without adequate care each year due to lack of providers, providers only accepting cash-pay patients, and major issues with insurance coverage of mental health conditions including total lack of coverage and high rates of out-of-network providers and associated out-of-pocket costs.17,18 These
issues are made worse in rural areas, which face additional barriers in transportation, lower rates of insurance, greater stigma in seeking mental health care, and even fewer available providers (especially specialty providers like psychiatrists or child/adolescent providers). COVID-19 was an important historical event that occurred since the publication in 2015 of Rural Healthy People 2020. The COVID pandemic had unique impacts on the mental health of rural children and adults. Children in rural areas were significantly more likely to experience anxiety before the pandemic, but the differences between rural and urban became smaller during the pandemic. Children in rural areas saw significant increases in behavioral problems during the pandemic, while the same increases were not seen in their urban counterparts. No differences between rural and urban children were seen in the prevalence of depression before or during the pandemic.

HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES: MENTAL HEALTH AND MENTAL DISORDERS

The primary goal for mental health and mental disorders in the U.S. Department of Health and Human Services (DHHS) Healthy People 2030 initiative is to “improve mental health,” with a focus on “the prevention, screening, assessment, and treatment of mental disorders and behavioral conditions.” Healthy People 2030 identifies 26 objectives to address this goal. In this chapter, the section on the intersection of health care and mental health care will address objectives MICH-D01 and MHMD-08. The section on individuals with disabilities will address objectives DH-02, DH-D01, and DH-01, while the section on children and adolescents will address objectives EMC-D05, AH-D02, MHMD-03, EMC-D04, and MHMD-08. The fourth section on suicide and injury prevention will address objectives MHMD-01, MHMD-02, and LGBT-06.

MENTAL HEALTH AND MENTAL DISORDERS IDENTIFIED AS #1 RURAL HEALTH ISSUE

The Rural Healthy People (RHP) 2030 survey, conducted by Texas A&M University, clarifies the current priorities of rural stakeholders. Mental health and mental disorders was ranked as the fourth most important priority in RHP 2020 and has escalated to the number one priority for RHP 2030. Action is being taken by federal and state governments to address what some have classified as a U.S. mental health crisis. Responses range from presidential strategies, to reports from the Surgeon General, to increased funding for mental health initiatives. Over the last decade, there have been decreases in stigma related to talking about mental health due to campaigns like “Okay To Say” and the acceptance of mental health mobile applications and other online mental health help. The economic burden of unmet mental health needs entails lost productivity, preventable emergency room visits, and overutilization of the criminal justice systems in lieu of proper treatment. In addition, the opioid epidemic and resulting overdose deaths have highlighted a dire need to improve mental health and mental health care in our nation. It is clear that rural constituents share this urgency, which is likely further fueled by the additional barriers faced in addressing health needs in rural areas. In fact, in RHP 2030 survey results, all four U.S. census regions (West, South, Midwest, and Northeast) agreed that mental health is the highest-ranked health priority for rural communities.

This chapter will provide an overview of the goals and objectives for mental health and mental disorders in Healthy People 2030 and include literature that has evolved over the last 10 years about rural mental health disparities. Based on the priorities and the literature review, the chapter will further discuss the intersection of health care and mental health care, mental health needs of individuals with disabilities, mental health in children and adolescents, and suicide and injury prevention. These sections will include recent research on disparities (i.e. rural/urban, race/ethnicity, other subpopulations), known causes of issues and barriers to treatment, and proven solutions to address each topic.

INTERSECTION OF HEALTH CARE AND MENTAL HEALTH CARE

There are more than 160 million people living in mental health professional shortage areas (MHPSAs) where access to mental health
treatment is limited or nonexistent. Approximately 68% of identified MHPSAs are in rural locations. Additionally, historical stigma for seeking mental health treatment among rural populations decreases the likelihood that rural populations will receive mental health treatment despite having higher rates of depression and suicide. As a result, primary care clinics and emergency rooms are often the main access points for mental health treatment in rural communities.

Medical providers are often the first to identify mental health conditions through routine screening outlined by the U.S. Preventive Services Task Force (USPSTF). The USPSTF has developed numerous guidelines for the assessment and treatment of mental health conditions in medical settings including primary care clinics. These guidelines directly address the Healthy People 2030 objectives related to screening for mental health concerns (MICH-D01, MHMD-08). Universal depression screening using evidence-based screening questionnaires is recommended for adults and adolescents, including women in the peripartum and postpartum period. Universal screening for anxiety disorders in pediatric and adolescent populations is also recommended, while suicide screening is not universally recommended unless a patient is identified as being at increased risk for suicide.

One strategy to address knowledge and training gaps among primary care and emergency medical providers is to provide integrated behavioral health opportunities within rural primary care and emergency settings. Integrated behavioral health initiatives aim at addressing access and stigma concerns by providing both mental health and medical care within primary care and emergency settings. There are two predominant models for integrated behavioral health including the Primary Care Behavioral Health Model (PCBH) and the Collaborative Care Model (CoCM). The Substance Abuse and Mental Health Services Administration (SAMHSA) and the Health Resources and Services Administration (HRSA) also developed a framework for integrated behavioral health to help health care systems better understand the ways that mental health providers can partner with primary care and emergency providers to address disparities in mental health care in rural settings.

**Primary Care Behavioral Health Model**

The PCBH model is a population-based interdisciplinary model where mental health providers known as behavioral health consultants are embedded within medical settings to provide targeted practice-based prevention and intervention for comorbid mental and physical health conditions. Behavioral health consultants are often on call to receive a “warm handoff” or same-day contact from the medical providers for brief consultations, focused assessments and diagnostic clarity, and/or brief interventions. According to Hunter et al the purpose of the behavioral health consultant is to provide feedback to physicians and develop a treatment plan for the patient. There are no appointment limits and patients often meet with the behavioral health consultant before, during, or after visits with their physician. The primary goal of this model is to provide evidence-based interventions from a biopsychosocial perspective for a wide array of presenting concerns throughout the lifespan. The PCBH model is ideal for same day nonpharmacological face-to-face behavioral health interventions to treat mental and physical health conditions. The Rural Health Information Hub provides models of PCBH in rural clinics and hospitals.

**Collaborative Care Model**

The CoCM uses principles of chronic illness management and applies them to mental health conditions through population health-based approaches. Primary care providers often partner with psychiatric consultants and develop strategies for case management with other mental health personnel to track specific mental health
conditions within defined patient populations through patient registries for specific concerns (e.g., Major Depressive Disorder). Measurement-based practice, including frequent follow-up screening, is utilized to identify individuals in need of additional mental health services from either a psychiatric consultant, primary care provider, or case manager who may recommend medication changes or brief behavioral interventions. Most patient contacts for mental health treatment are conducted between the patient and either the primary care provider or case manager. This provides the ability for the psychiatric consultant to care for a large patient population remotely which offers the possibility for psychiatric care to be accessed by rural populations. The CoCM is typically focused on pharmacological management of mental health conditions within primary care with population-based strategies to monitor longitudinal treatment over time for primary care populations without face-to-face visits with a psychiatric consultant.

Research Support for Integrated Behavioral Health

Research supports the use of integrated behavioral health strategies for mental health treatment within underserved populations such as those in rural settings. Ogbeide et al. found that 61% of underserved primary care patients who engaged in integrated behavioral health services would not have sought mental health treatment if it had been offered outside the primary care setting. This study represents the importance of having integrated behavioral health services available in primary care and emergency settings in rural locations to increase access and decrease stigma commonly associated with mental health treatment. The CoCM has also been found to be just as efficacious in reducing rates of depression in rural settings compared to urban settings. Additionally, integrated behavioral health services within medical settings in general have been found to be cost effective, improve patient outcomes and experiences, and even decrease burnout of medical personnel.

INDIVIDUALS WITH DISABILITIES

The mental health and health care of rural Americans living with disabilities warrants particular attention. More than one in four adults in the U.S. are living with a disability, rates of which are highest in the South (including urban) and in rural areas. A population-based survey comparing rates of disability of adults living in six different county types, from large metropolitan to noncore or rural counties, revealed that adults in rural areas were 9% more likely to have a disability and 24% more likely to have three or more disabilities, even after controlling for notable demographic factors (e.g., age, race/ethnicity, sex, education, and poverty level). The subpopulation of people with disabilities is diverse, comprised of individuals with developmental or acquired disability and functional differences in physical movement and mobility, cognition and learning, hearing, vision, psychological and emotional well-being, self-care, or independent living, and those living with chronic conditions. Importantly, the prevalence of individuals living with mobility, cognitive, hearing, vision, self-care, and independent living disabilities was highest in rural versus large metropolitan areas, with rural adults having anywhere from a 7% (cognition) to 35% (hearing) increased likelihood of disability.

In consideration of the existing disparities for people with disabilities, DHHS has established the following objectives for mental health and mental disorders in its Healthy People 2030 initiative: reduce the proportion of adults with disabilities who delay preventative care because of cost (DH-01); reduce the proportion of adults with disabilities who experience psychological distress (DH-02); and reduce anxiety and depression in family caregivers of people with disabilities (DH-01). Based on the existing disability literature and advocacy efforts, this section will explore three potential solutions in working to address these objectives for rural people living with disabilities: 1) utilizing telehealth services to help reduce cost and increase access to specialty care; 2) educating providers on, and use of disability-affirmative integrated primary care; and 3) educating providers on, and use of family-centered care.

Reduce the Proportion of Adults with Disabilities Who Delay Preventative Care Because of Cost

Many people with disabilities in rural areas face socioeconomic disadvantages including
higher rates of poverty, unemployment, lower educational attainment, and inadequate health insurance. It is estimated that approximately one in three disabled adults do not have a usual health care provider and have an unmet health care need due to cost. According to Healthy People 2050, 53.2% of adults with disabilities experienced delays in receiving primary and periodic preventive care due to cost in 2019. A primary systemic issue for people with disabilities is accessible and affordable health care, which is compounded by rurality. Many rural areas lack specialty care or primary care physicians who are competent or confident in caring for the unique needs of disabled individuals. Findings from a recent survey indicate that only 40.7% of physicians report confidence in their ability to provide equitable care to people with disabilities. Many rural areas also do not have accessible health care buildings or equipment. Collectively, these barriers either lead people with disabilities to receive non-specialized and/or poor-quality care from a local primary care provider or spend time and money traveling long distances to receive specialized care in urban areas. The latter may often not be possible as the lack of accessible transportation is one of the most widely cited barriers to care for disabled people. These issues are further compounded in rural areas that may not have sidewalks, public transportation, rideshare options, and/or accessible restrooms en route to metropolitan health care centers.

Reduce the Proportion of Adults with Disabilities Who Experience Psychological Distress

Healthy People 2030 revealed that 22% of adults with disabilities aged 18 years and over experienced serious psychological distress in 2018. Nationwide estimates suggest that adults with disabilities are 4.6 times more likely to experience mental distress, rates of which appear to be highest among individuals with both cognitive and mobility disabilities (55.6%). Similar patterns of poorer mental health have been observed in young people with disabilities. Research on the mental health of people with disabilities in rural communities is quite limited. However, some studies suggest that physical, economic, and quality health care barriers as well as lack of transportation, cultural and social differences, geographic isolation, and stigma are thought to contribute to worsened physical and mental health in rural areas. Anxiety and depression are some of the most widely cited mental health concerns among disabled people. Indeed, disabled women in rural areas report higher rates of depression compared to women in urban areas, and experience greater barriers to receiving mental health treatment.

There is a known shortage of mental health providers across the U.S., particularly in rural areas. Moreover, if a mental health provider is available within rural communities, it is not guaranteed that they will be equipped with the specialized knowledge of living with a disability. For example, rehabilitation psychologists are specialized providers who receive training in, and provide clinical service, conduct research, and advocate on behalf of persons with disability. However, based on a recent state-of-the-field survey, only 4% of rehabilitation psychologists (10 out of 259 respondents) reported working in rural areas. This suggests that people with disabilities in rural areas may not only have unmet mental health care needs, but they may not have access to the type of specialized mental health care that may be of utmost benefit to them.

Reduce Anxiety and Depression in Family Caregivers of People with Disabilities

Physical, economic, and quality health care barriers are also thought to extend to the experience of family members of people with disabilities. The cost of professional care attendant services is often unaffordable or unavailable, which may be particularly true in rural areas, often necessitating family members to assume the role as a personal care attendant. As a result, many family members of people with disabilities, whether parents of children with a disability, a spouse, or adult family member caring for a relative with a disability, may encounter additional stress and responsibility. A robust caregiving literature review indicates increases in psychological distress, poor health habits, physical illness, and mortality among caregivers, with caregiving having the most notable impact on one’s psychological well-being, particularly depression and stress. In a recent study of caregivers of people with either physical or mental disabilities, 33% of caregivers...
reported levels of “probable” depression and 19% reported suicidal ideation. Similarly, in a study of caregivers of people with intellectual or psychiatric disabilities, caregivers reported symptoms of stress, anxiety, and depression, with rates highest among caregivers of people with intellectual disabilities. However, it also important to note that many family members demonstrate great resiliency and report positive impacts of caregiving, such as increased sense of purpose, meaning and strengthened relationships.

Utilizing Telehealth Services to Help Reduce Cost and Increase Access to Specialty Care

As will be seen throughout this chapter, telehealth is one viable option to accessing specialty care such as rehabilitation psychology services.

“Rehabilitation Psychologists assess and treat cognitive, emotional, social, behavioral, and functional difficulties; seek to build on individual's strengths; consider psychosocial factors; and help people to overcome barriers to participation in life activities.”

In a recent state-of-the-field survey, 96% of rehabilitation psychologists reported working in urban/suburban areas, with 70% working in hospitals/medical centers. Use of telehealth services will allow specialty providers in urban areas to provide care to rural people with disabilities, versus relying on primary/general care within the rural community. The use of telehealth services is also likely to help reduce economic and transportation barriers involved in seeking specialty care. Current policies limit access and reimbursement of telemental health care services across state lines; therefore, advocacy efforts aimed at expanding access to specialty providers across state lines will only further reduce health care disparities for people with disabilities.

Disability-Affirmative Integrated Primary Care

Consistent with the content above regarding integrated behavioral health in primary care settings, rural people with disabilities that include mental health care needs may be more likely to first seek care in primary care settings. Thus, rural providers – physicians, nurses, social workers, and mental health care providers alike – are encouraged to receive education in and adopt disability-affirmative integrated primary care. The tenets of disability-affirmative and competent care are centered on taking a person-centered approach, respecting patient choice, and eliminating medical and institutional bias. Disability-affirmative care encourages providers to treat people with disabilities in a holistic manner, to engage in care coordination and connect people with disabilities to specialists, long-term services, supports, and behavioral health. Therefore, adequate provider training in disability-affirmative care will likely increase the chances that people with disabilities are properly referred to, and receive, necessary behavioral health care.

Family-Centered Care

Ideally, people with disabilities and their families would also receive family-centered care, which is a collaborative approach to health care among health care providers, individuals, and their family members. This collaborative approach aims to improve communication, include integral family members in health care decisions, and provide greater continuity of care. Research on family-centered care has shown lower levels of stress, improved mental health, and greater satisfaction for parents of children with disabilities. Therefore, training providers in rural areas on the delivery of family-centered care will likely be beneficial for helping to reduce mental health concerns among family caregivers of people with disabilities, with likely trickle-down effects on family members with disabilities.

CHILDREN AND ADOLESCENTS

Rural youth have comparable mental health needs to their peers in urban areas, but the availability of care providers and community resources to support mental health drastically differs. Most rural communities within the U.S. are designated as MHPSAs and lack access to effective mental health care programs and treatments, which leads to countless youth struggling with mental health issues without support. The increased risk factors for youth in rural communities are well documented, including increased suicide rates, financial distress, isolation, stigma, and low mental health literacy. Additionally, higher exposure to co-occurring ACEs have been
identified amongst individuals living in rural areas.\textsuperscript{60,61} This can increase one’s risk of suicide, as well as mental and physical health needs. Many rural communities have shown promising improvement in the mental health of their youth by addressing these disparities through prevention and intervention on three fronts: primary care, community partnerships, and schools.

**Youth Behavioral Health within Primary Care**

Primary care is a critical access point for children and adolescents in rural areas. While the DHHS Healthy People 2030\textsuperscript{21} objectives for children focus on increasing the proportion of children who get appropriate treatment for behavior problems (EMC-D05), symptoms of trauma (AH-D02) and mental health problems like anxiety and depression (MHMD-03, EMC-D04), the first step in this process is proper screening (MHMD-08) followed by brief interventions. By screening for youth mental health needs regularly within health care settings, and providing brief interventions, duration and prognosis can be improved.\textsuperscript{62} Some examples of evidence-based models for youth include The Programme for Improving Mental Health Care (PRIME)\textsuperscript{63} and the Teens Achieving Mastery over Stress (TEAMS).\textsuperscript{64}

The PRIME is a project generating evidence on increasing mental health care in underserved countries facing similar mental health disparities as rural America. PRIME has shown acceptability and feasibility among stakeholders, communities, and health care workers for the utilization of trained health care staff and the task sharing of mental health care as an effective means to decrease stigma and increase support.\textsuperscript{65} To increase mental well-being, TEAMS, a depression prevention program, has also been shown to be effective within primary care settings.\textsuperscript{64} By training medical professionals in effective skills-based programs such as these, rural communities can increase mental health care support and alleviate some of the rural care disparities.

**Youth Behavioral Health through Community Partnerships**

Communities provide another mechanism for children and adolescents to receive mental health support, especially care focused on prevention and early intervention. Community mental health awareness programs are key to increasing access and improving youth mental health care. Partnerships and collaborations among community organizations and stakeholders can increase the success and continuation of initiatives. Lack of parent mental health literacy and resource knowledge is a significant barrier to rural youth accessing mental health care.\textsuperscript{65} Gatekeeper and mental health literacy or awareness programs have been shown to be an effective means of decreasing stigma, increasing understanding of coping skills, and increasing competency of community members to assist and support others.\textsuperscript{57,58,66} Many programs have shown innovation in increasing community involvement in these events, such as Neighbor-to-Neighbor (N2N), where mental health education and resources were delivered at community tailgating events with a meal provided to participants.\textsuperscript{57} Mentoring programs within communities are also an effective means of improving academic, social, emotional, and behavioral outcomes for youth\textsuperscript{67} and can be most beneficial when mentors are consistent in attendance of mentorship appointments.\textsuperscript{68} Tele-mentoring can also be used as an effective means of increasing the competencies of providers within rural communities to effectively intervene and treat youth with severe mental illness.\textsuperscript{69}

**Youth Behavioral Health within Schools**

Schools provide another access point for youth mental health. The Healthy People 2030\textsuperscript{21} objective EMC-D06 seeks to increase the proportion of children and adolescents who get preventative mental health care in school. In rural communities, this can potentially transform mental health care access among youth, as rural schools are often community cornerstones.\textsuperscript{70} For many rural areas, state and/or federal funding for mental health care in schools has increased in response to the COVID-19 pandemic. The impact of this funding is not yet seen in the literature, which is sparse for evidence-based mental health programs and interventions in rural schools. Utilizing evidence-based practices which were created and evaluated in urban schools in rural schools without modification to fit the uniqueness of the rural community should be avoided.\textsuperscript{71} Collaborations among community
members, educators, mental health professionals, and researchers can lead to effective social and emotional learning and trauma-informed education programs designed for the unique needs of rural schools.\textsuperscript{70}

**Increasing Mental Health Support for Youth**

While the barriers and disparities related to rural youth mental health are daunting, hardships are not new to rural communities. Characteristics common to rural communities, such as resiliency and strength of community, can be utilized to mitigate the current youth mental health crisis. Rural areas can combat mental health disparities and lack of access to care through programs within primary care, communities, and schools. However, many of these entities are already overloaded with meeting the physical, academic, and personal needs of their communities. The following are methods of implementing mental health care programs, interventions, and support without overwhelming the systems or individuals working within systems.

**Telebehavioral Health and Youth**

It is important to highlight the increased acceptance and evidence for the effectiveness of mental health care delivered via telehealth as a front-line intervention for youth within rural communities.\textsuperscript{72} While there may be connectivity issues for many living in rural areas, entities such as schools, healthcare offices, community centers, and libraries can partner with telehealth providers through the hub and spoke model.\textsuperscript{73} Specifically for youth, telebehavioral health care has high rates of utilization, effectiveness, and satisfaction.\textsuperscript{36,72,74} Rural youth express significant concerns related to confidentiality when seeing a provider in their own community, which could create preference for utilizing telehealth with providers outside of their community.\textsuperscript{75} Digital health and telehealth interventions are effective, and youth show preference for accessing care through these mediums.\textsuperscript{76} Across access points of mental health care, special attention and consideration should be made to ensure confidentiality for youth engaging in mental health supports.

Schools typically have internet access and have become a part of hub and spoke models for telehealth in rural communities, serving as the access point for telebehavioral health services for students. While some states have passed legislation allowing for insurance to cover tele-mental health care in schools, others are passing funding for health-related institutes to provide telebehavioral health care in schools (i.e., Hopeful Futures Campaign). This is an important step in ensuring access for the uninsured in rural communities. In addition to school counselors and campus support staff, there has been success with sharing licensed mental health professionals across rural school districts. These professionals can provide both telebehavioral and in-person services for students with more severe mental health issues. Additionally, there is support for engaging school counselors, mental health staff, and lay mental health providers in rural schools in virtual skills building and mental health competencies.\textsuperscript{77} Utilizing the Extensions for Community Health Outcomes (ECHO) model, partnerships between universities and rural school mental health supports have also been shown as an effective way to increase competencies in specific areas of mental health care.\textsuperscript{78}

**Community Health Workers**

Community health worker (CHW) models are well known for serving adults and this is an emerging practice for helping youth with mental health concerns in school, community, and medical settings. By having CHWs trained in mental health topics, youth mental health needs are more readily identified and interventions can commence.\textsuperscript{79} It is critical for medical settings and schools to have processes and procedures in place for mental health screenings and the identification of youth who may be struggling with emotional and behavioral distress, and for communities to have programs and mentors or CHWs to help promote mental wellness. The CHW has a unique advantage in reducing stigma, as they are members of the same community and have shared life experiences.\textsuperscript{79} Within rural communities, individuals fulfilling multiple roles is common, and this cultural norm of task sharing can be successfully utilized to include mental health. Collaboration and interconnected systems between touchpoints can lead to greater improvements in outcomes and reductions in mental health disparities for rural youth.\textsuperscript{80,81}
Partnerships between families, communities, schools, and healthcare are essential for reaching these aims. Programs such as Telehealth ROCKS increase access to effective behavioral health care by utilizing CHWs to support families, while coordinating and facilitating the navigation of services and partnering with schools, communities, and health care providers.

**SUICIDE AND INJURY PREVENTION**

Suicidality and intentional self-harm remain significant public health concerns across the U.S., especially in rural areas. From 1999 to 2016, the U.S. has seen a rise in suicide rates, with the most significant increase being in rural counties. Accordingly, the Healthy People 2030 initiative identified several related objectives, including reducing the overall suicide rate (MHMD-01), reducing suicide attempts in adolescents (MHMD-02), and reduction of suicidal thoughts in lesbian, gay, bisexual, and transgender youth (LGBT-06).

This section will explore current statistics and potential solutions for these objectives.

**Reducing the Overall Suicide Rate**

According to data from the 2018-2019 National Vital Statistics System, suicide was the 10th leading cause of death in the U.S., with the highest rates among Native American/Alaskan Native and White persons. While women were more likely to attempt suicide, men were more likely to die by suicide. Further, while studies have shown similar rates of suicidal ideation across geographic groups, rural-residing individuals have higher rates of death by suicide than those in urban areas. Literature reviews examining the disparity in suicide risk between urban and rural individuals postulate that increased access to firearms and other lethal means, reduced access to health care and increased mental health stigma account for much of this variance.

Many systems have adopted “train-the-trainer” and “gatekeeper” models as a means of suicide prevention, with the hopes of training large numbers of suicide interventionists. However, such models are widely understudied with some evidence to suggest significant variability in their effectiveness. Additional evidence suggests that while such trainings improve understanding of suicide there is little evidence of a direct impact on suicidal behavior.

**Reducing Suicide Attempts in Rural Adolescents**

While rates for adolescent suicide attempts are high across the U.S., rural-residing teens are at greater risk than urban-residing teens. Nationally, suicide is the second leading cause of death for individuals aged 10-24 years. However, youth in rural areas have nearly double the suicide rate (1.8x) of urban youth. Gender and method explain much of the suicide rate disparity between urban and rural youth. For example, rural boys are at the highest risk for dying by suicide and report greater access to firearms, the most lethal suicide method, relative to girls and/or urban youth.

Rural teens also experience more difficulty accessing physical and mental health care providers, factors associated with higher suicide rates. With the growing need for mental health treatment and the significant shortage of mental health providers in rural areas, recent studies have pointed to increasing mental health care through schools (both in-person and via telehealth) and reducing access to firearms as potential solutions. Extensive resources for firearm safety and education are available through Project ChildSafe.

Evidenced based programs are also available for reducing youth suicide. Two examples are the Safe Alternatives for Teens & Youth (SAFETY) program and the Youth Aware of Mental Health (YAM) program. The SAFETY program is a suicide intervention program for youth and their families with efficacy when utilized by emergency departments and primary care. The YAM program is a suicide prevention and mental health literacy program focused on empowering youth to gain an understanding of stressors, protective factors, resources, and ways to support the mental wellness of themselves and their friends. The YAM program has been effective in reducing suicide attempts and suicidal ideations in youth. It has also been effectively implemented within rural schools by extension agents who are members of their rural communities.
Reducing Suicidal Thoughts in LGBT Youth

According to the Youth Risk Behavior Surveillance Survey conducted in 2017, lesbian, gay, bisexual, and transgender (LGBT) youth comprise an estimated 9.5% of U.S. adolescents. Moreover, nearly 25% of youth ages 12 to 14 who died by suicide identified as LGBT. Current empirical evidence suggests that LGBT youth in rural communities experience more difficulty in accessing resources and support than their heterosexual and cisgender peers, as well as LGBT youth in urban settings. For instance, rural healthcare providers report more discomfort treating sexual minority youth than those in urban areas. The LGBT youth in rural areas also report greater marginalization, stigmatization, and discrimination within their communities. Such incidents increase the vulnerability of LGBT youth in rural schools to victimization, bullying, and feelings of isolation. These factors have long been linked to the increased rates of suicidality for LGBT youth.

Recent studies suggest that family and peer acceptance and interventions targeting family-relationship stressors improve mental health outcomes for LGBT youth, including reduced suicidality. In addition, a 2021 meta-analysis examining over 20 years of literature on risk and protective factors for LGBT youth experiencing suicidal thoughts, reported further findings indicating a need to develop programs and policies to support and protect LGBT youth and their families. Studies explicitly examining predictive and protective factors for suicidality in transgender and gender non-conforming youth have demonstrated evidence that gender-affirming care significantly reduces a child’s risk for suicidal ideation and attempts. Gender-affirming care includes a wide array of services ranging from non-medical interventions such as the use of the child’s chosen name, support for gender-affirming hair styles and clothing, and for medical interventions such as puberty blockers. However, due to a lack of substantial knowledge on the long-term effects and implications of medically transitioning for children, providers should utilize the best available evidence to provide ethically sound, gender-affirming care.

SUMMARY

Addressing mental health needs is a clear priority for rural constituents. Issues of accessibility, availability, and acceptability of mental health care in rural areas are well documented. There are viable solutions for improvement as evidenced by the percentage of federally designated MHPSAs in rural or partially rural areas dropping from more than 85% to just under 68% since the 2015 publication of RHP 2020. The use of screening tools for anxiety and depression and the continued integration of mental/behavioral health care within primary care, coupled with intentional focus on training health professionals across disciplines in these models will positively benefit rural areas. Telehealth has a critical role in addressing the mental health crisis and can be used across the lifespan in a variety of settings including homes, schools, community centers, and medical facilities. Thinking outside the medical system by including peer support, utilizing evidence-based models for suicide prevention and mental health awareness, and capitalizing on extended support from community mental health workers will further increase access. Particular attention should be paid to those experiencing the greatest disparities in access and outcomes such as youth, LGBT individuals, and individuals with disabilities.

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Related Chapters:
Chapter 2. Addiction in Rural America
Chapter 5. Rural Substance Misuse Trends in America
Chapter 18. Rural Health Issues in Child and Adolescent Development
Chapter 20. The Issue of Chronic Pain in Rural America

Suggested Chapter Citation:
Addiction, clinically referred to as a substance use disorder (SUD), is a complex disease of the brain and body that involves compulsive use of one or more substances despite serious health and social consequences. The term addiction medicine has been recognized since 1990 and is concerned with the prevention, evaluation, diagnosis, treatment, and recovery of persons with the disease of addiction. This includes those with substance-related health conditions, and people who show unhealthy use of substances such as nicotine, alcohol, prescription medications, and other licit and illicit drugs. Addiction Psychiatry became an available certification from the American Board of Medical Specialties (ABMS) in 1993 and Addiction Medicine was recognized as a medical subspecialty under the American Board of Preventive Medicine in 2016, with certification available in 2017. 

While addiction can involve a single or multiple substances, America is faced with a catastrophic health problem due to the swift increase in fatal overdoses from opioid addiction. Opioids are estimated to claim the lives of over 130 Americans every day. Roughly two-thirds of all American overdose deaths in 2017 involved opioids, and an estimated 100,506 Americans died between April 2020 and March of 2021, making opioids a leading cause of injury-related death among adults. 

Addiction as a Health Condition. Addiction involves both behavioral activities and neurobiological changes that contribute to
dependency that impairs day-to-day functioning; addiction interferes with the ability to maintain positive relationships, employment, and/or education.\textsuperscript{11} Substances commonly associated with addiction (e.g., alcohol, cocaine, amphetamines, and opiates/opioids) share common effects on neural adaptation, which are mediated by dopamine activity in parts of the brain known as the “reward pathway”.\textsuperscript{12} The reward pathway evolved to promote behaviors that enhanced survival, such as food gathering and reproduction. The neural structures in the reward pathway are saturated with dopamine receptors. Substances that cause addiction typically increase dopamine activity in the reward pathway and create lasting adaptations that intensify addiction.\textsuperscript{12}

With repeated use, neurological changes reinforce drug-seeking behaviors. Ironically, dopamine

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**Table 1. Rural-urban substance use rates by population and substance type (ages 12+ unless noted).**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Non-metropolitan</th>
<th>Small metropolitan</th>
<th>Large metropolitan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol use by youths aged 12-20</td>
<td>29.8%</td>
<td>28.5%</td>
<td>28.1%</td>
</tr>
<tr>
<td>Binge alcohol use by youths aged 12-20 (in past month)</td>
<td>7.7%</td>
<td>9.1%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Cigarette smoking</td>
<td>26.7%</td>
<td>20.0%</td>
<td>15.8%</td>
</tr>
<tr>
<td>Smokeless tobacco use</td>
<td>7.1%</td>
<td>4.1%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Marijuana</td>
<td>15.7%</td>
<td>19.4%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Illicit drug use</td>
<td>18.4%</td>
<td>22.4%</td>
<td>22.5%</td>
</tr>
<tr>
<td>Misuse of opioids</td>
<td>3.2%</td>
<td>3.6%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Cocaine</td>
<td>1.2%</td>
<td>1.7%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>2.3%</td>
<td>2.3%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>1.5%</td>
<td>0.9%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

**Source:** Substance Abuse and Mental Health Services Administration (SAMHSA), Results from the 2021 National Survey on Drug Use and Health: Detailed tables.

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**Figure 1. Overdose Deaths by Rural v. Urban for All Substances**

*Drug-induced Death Rate per 100,000*

- **Urban Rate**
- **Rural Rate**

receptor activity decreases with chronic substance use such that people with SUD may only feel “normal” when using the substance. Withdrawal can lead to depressed mood, cravings, and relapse; repeated use also inhibits frontal lobe function, contributing to poor impulse control and judgment. Understanding that addiction is a health condition with neurobiological changes can reduce stigma and remove barriers to treatment and sustained recovery.

**RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES**

Healthy People 2020 named 11 objectives focused on outcomes related to opioids under the priority topic “Substance Abuse”. The current Healthy People 2030 program focuses on preventing SUD and helping those with SUD get treatment. Addiction or SUD is linked to many health problems and can lead to overdose and death. Addiction is listed in Healthy People 2030 as a health condition with a 2030 goal to reduce drug and alcohol addiction that is linked to five (5) baseline objectives and three (3) developmental objectives.

- SU-01: Increase the proportion of people with SUD who got treatment in the past year
- SU-03: Reduce the proportion of people who had alcohol use disorder in the past year
- SU-14: Reduce the proportion of people who had marijuana use disorder in the past year
- SU-15: Reduce the proportion of people who had drug use disorder in the past year
- SU-18: Reduce the proportion of people who had an OUD in the past year
- SU-D01: Increase the number of admissions to substance use treatment for injection drug use
- SU-D02: Increase the number of people who get a referral for substance use treatment after an emergency department visit
- SU-D03: Increase the rate of people with an OUD getting medications for addiction treatment

**RURAL HEALTHY PEOPLE 2030 SURVEY**

“Addiction” was not an available term for ranking in previous Rural Healthy People (RHP) surveys nor a leading indicator for Healthy People in prior decades. “Substance Abuse” was ranked fifth in the 2020 edition of RHP. In the current RHP 2030 survey, “Addiction” as a health condition ranks as the second overall health priority for rural Americans for the coming decade, and “Drug and Alcohol Use” as a health behavior is ranked fifth. The RHP 2030 survey respondents, representing rural America, voiced concerns over mental health and substances consistently across all groups surveyed (e.g., gender, age group, employment type). Outcomes from the RHP 2030 survey fall in line with the overwhelming concern voiced by many state and local officials who view opioid abuse as the most pressing problem facing rural America.

**Figure 2. Rural-Urban Substance Use Rates by Census Region and Substance Type (Ages 12+)**

![Rural-Urban Substance Use Rates](image-url)
PREVALENCE AND DISPARITIES IN RURAL AMERICA

Overall, the opioid epidemic has disproportionate impacts in rural communities. In 2015 the overdose death rate for rural Americans surpassed those in urban areas. Variations in urban versus rural rates of overdose deaths have fluctuated over time with different patterns related to specific substance types. Rural America has limited access to general healthcare and even more limitations related to substance use treatment providers. Figure 3 provides a snapshot of SUD treatment providers per 100,000 population, highlighting rural and urban counties. While it appears on the map that several rural counties have high rates of providers per the color coding, these rates are inflated by low populations in these counties. Notably, there are large rural swaths with no substance use providers, particularly in the central part of the country. Rural communities have distinctive factors that increase susceptibility and vulnerability to drug use and associated harms such as earlier age of drug use, engagement in riskier drug use behaviors, and increased likelihood of methamphetamine use.

Alcohol Use. Alcohol use has been shown to be more prevalent in rural areas, and mortality rates in rural populations while driving under the influence of alcohol are twice as high as in urban areas. Broffman et al. reported that mental health conditions and alcohol misuse are seen as normal parts of life by rural individuals and therefore do not require treatment. Some treatment barriers for alcohol misuse in rural America can be attributed to stigma, denial, and a lack of healthcare providers who provide medically assisted treatment for alcohol use disorder. It is suggested that use of medications for alcohol use disorder (MAUD) and medications for OUD (MOUD) follow similar patterns and are both more prevalently used in urban than rural communities.

Underage drinking is a pattern within rural communities, and alcohol use continues into college years for rural populations. However, urban and rural rates of alcohol consumption were disproportionate with urban students being much more likely to consume alcohol in their

Figure 3. Substance Use Disorder Treatment Providers by Population and Urban-Rural Counties
freshman year of college. Future interventions for rural communities will need to include improving community-based resources and prioritizing access to care.

Marijuana Use. Increased psychosocial stress is linked to higher rates of marijuana use among rural populations. Young adults consider driving under the influence of marijuana less dangerous than driving under the influence of alcohol. The nationwide acceptance of marijuana has led to increases in use during pregnancy which is correlated with negative outcomes for newborns. The misperception that marijuana has no impact on infant health is prevalent among rural women and their families.

Illicit Drug Use. Urban-rural differences in overdose rates involving psychostimulants with abuse potential (methamphetamine, amphetamine, and methylphenidate) have consistently remained higher in rural areas since 2012. Rural communities can have environmental elements that support methamphetamine use such as earlier exposure from a friend or family member, availability and being inexpensive, and lower stigma relative to heroin. Rural residents reported using methamphetamines as a temporary coping mechanism for opioid withdrawal. Specifics include times when MOUD was not available, during efforts to quit using opioids or enhance functioning, and especially in labor intensive jobs or those with long shifts. Heroin is also known as an attractive alternative for those addicted to prescription opioids as it is cheaper and more readily available. In addition to heroin and methamphetamines, people who inject drugs (PWID) also report injecting fentanyl. Most heroin found in the U.S. has entered the country through the southern border from Mexican drug trafficking organizations who control the wholesale distribution of heroin in the U.S. Concurrent use of methamphetamine and opioids is associated with increased injection drug use, HIV and hepatitis C virus (HCV) infections, and severe mental illness that boosts adverse outcomes. As no medications are currently available for those addicted to stimulants, behavioral healthcare is critically important, but these resources are lacking in most rural areas.

Opioid Use/Misuse. Overall, rural residents using opioids reported overall poorer health, higher pain levels, lower education, and a higher rate of unemployment that those in urban areas. Rural residents are also more likely to be prescribed an opioid than those in urban areas. While larger cities have seen a decline in prescription opioid overdose deaths, possibly due to policy changes and increased use of heroin, this rate remains high in rural areas. Synthetic opioids, manufactured from inorganic chemicals, are tightly controlled in the U.S. Street synthetics, analogs that are inexpensive to produce, potent in small amounts, and easily mixed with other substances, are produced abroad and brought across U.S. borders. Fatal overdoses from synthetic opioids are growing in urban areas due to high potency, lower cost, and ample availability.

VARIATION BY RURAL REGIONS

The geography of the opioid overdose crisis shows spatial mortality discrepancies across America with large areas of the upper Midwest and Great Plains having some of the lowest rates of fatal overdoses; Appalachia and parts of the Ohio River Valley have, for some time, experienced the highest fatality rates. There are also areas with previous minor drug problems that are now suffering high opioid overdose fatalities, in particular states in the Southwest, Eastern Great Lakes, and New England. Risk factors contributing to higher overdose rates include high rates of poverty, unemployment, disability, single parent families, divorce, lower educational attainment, and belonging to certain vulnerable demographic groups such as the elderly, military veterans, and Native Americans. Areas of high opioid overdose tend to be older communities that are less racially and ethnically diverse and have a declining industrial base.

VARIATION BY RACE AND ETHNICITY

At the start of the opioid epidemic, there were associations between opioid overdose deaths and being White, middle-class persons. However, trends for the last two decades show that overdose death rates for Black individuals have doubled with the steepest rise in rural opioid death rates from 2016 to 2017. Overdose deaths from
opioids have increased across all racial and ethnic groups.\textsuperscript{32,34} There has been a dramatic increase in deaths for low socioeconomic status Whites as OUD-associated deaths occur at a higher rate in rural counties with higher populations of poor and unemployed Whites.\textsuperscript{32}

Higher rates of opioid prescribing, fentanyl exposure, economic distress, reliance on mining and employment in the service sector, and constant population loss are associated with higher fatal drug overdoses among non-Hispanic Whites.\textsuperscript{41} Rural White Americans are more likely to use injectable opioids.\textsuperscript{29} Limited awareness of injection risks and co-occurring mental health problems are precursors to injection opioid use; additionally, many rural residents experience income-related struggles and gaps in insurance, which are both connected to greater risk for opioid-related consequences.\textsuperscript{29}

Age-adjusted opioid-overdose death rates have steadily increased for the past 20 years in rural America and data shows that rural residents are less likely than their urban counterparts to be administered naloxone, a medicine that rapidly reverses an opioid overdose, by emergency departments.\textsuperscript{29} Literature also shows greater barriers in accessing naloxone exist for Whites and younger adults, two groups who have had an increase in overdose deaths and a rise in seeking treatment for OUD.\textsuperscript{29,41}

**IMPACT ON SPECIAL POPULATIONS**

**Pregnant and Parenting Women.** Pregnant women in rural America are more likely to report both illicit opioid use and use of multiple illicit substances than their urban peers.\textsuperscript{31} Primary treatment barriers to parenting women with SUD (both in urban and rural areas) are reported as access to specialty health care services, affordability, stigma, and lack of readiness to stop using.\textsuperscript{46} Parenting women with SUD residing in rural areas have 97% lower odds of undergoing SUD treatment compared to those in urban areas.\textsuperscript{46} About 20% of parenting women with SUD in rural areas reported using SUD treatment, although only about 10% of these women perceived a need for treatment.\textsuperscript{46}

**Infants, Children and Adolescents.** Rates of neonatal abstinence syndrome (NAS) are higher in rural areas versus urban.\textsuperscript{34,47} The developmental consequences of NAS can include low birth weight or premature birth, failure to thrive, and placement in the neonatal intensive care unit. Parental SUD can also result in child abuse and/or neglect due to impaired parents, and the social and economic consequences of SUD. Research has identified associations between the prevalence of opioid diagnoses and hospitalizations for child maltreatment.\textsuperscript{48} The intergenerational normalization of substance misuse creates risk for children to develop unhealthy relationships with substances as they grow.\textsuperscript{49}

**Adolescents.** Opioid misuse, addiction, and overdose has emerged as a national health crisis among adolescents. The earlier an individual initiates alcohol use, the greater their risk for misusing alcohol as an adult.\textsuperscript{50} Nearly 17% of high school students have misused prescription opioids.\textsuperscript{6,51}

**BARRIERS**

Disparities related to addiction in rural America are vast and well documented to include poor treatment infrastructure; insufficient or lack of insurance coverage; geographic isolation; lack of transportation; low health literacy; smaller health care workforce with a lack of treatment services as well as providers trained in providing this type of specialty care; and stigma. It is suggested that the extent of the current rural opioid crisis is not fully known. Deaths from unknown opioid-like substances that escape detection are attributed to less detailed toxicology tests.\textsuperscript{9} General barriers to SUD treatment exist in rural communities including access to and availability of services, access to current technology to support client services and/or functions of the agency, cost of services, denial, and stigmatization.\textsuperscript{10,25,27,46,52}

**Lack of Rural Treatment Options.** A commonly noted barrier to accessing SUD is travel distances for rural Americans due to the lack of treatment options locally, including limited facilities and workforce.\textsuperscript{20,21,25,27,33,34,35} Rural Americans are challenged by a lack of access to treatment with fewer methadone programs, MOUD providers, and behavioral health services.\textsuperscript{28,33} A lack of mental health support services compounds the barrier to providing MOUD.\textsuperscript{20} While expansion
of telehealth and telebehavioral health services represent an opportunity to address key barriers and increase access to care, structural barriers such as availability of and access to internet and broadband services persist.\textsuperscript{25} There is a notable disparity in the availability of naloxone in rural communities\textsuperscript{54} as well as MOUD providers.\textsuperscript{55} There is a relative lack of MOUD available at federally qualified health centers in rural communities and it is estimated that less than 20\% of those with OUD receive MOUD.\textsuperscript{52,56} Previously there was a federal requirement for practitioners to have a special waiver obtained by submitting a Notice of Intent to prescribe MOUD. The need for this waiver was removed in 2023 and MOUD, like all other prescriptions, only requires a standard Drug Enforcement Administration (DEA) registration number. While previous literature noted a lack of treatment access for rural counties related to a lack of waivered providers, there are still challenges to access in rural counties that have providers. This was attributed to the vast MOUD demand and providers that were not offering MOUD despite being waivered.\textsuperscript{20,26,27,34,55} Table 2 presents data on counties with high-need, and low-to-no capacity, for buprenorphine prescribing for OUD by census region and rural-urban differences.

Stigma. Stigmatization against people who use drugs is a substantial issue in rural America. Stigma often manifests as negative perceptions held by community members and providers, and negative responses toward those using drugs, those seeking drug treatment, and those seeking treatment protocols.\textsuperscript{30,25,26,29,31,57} Negative attitudes and concerns regarding persons with SUD and medication treatments are some reasons few providers deliver treatment in rural settings.\textsuperscript{23,21,29,57} Stigma against those who use drugs can be especially pronounced in rural communities where there is decreased anonymity, lack of treatment resources, absence of harm reduction strategies, and lack of community understanding of addiction.\textsuperscript{23,58}

Table 2. Percentage of counties with need and capacity for buprenorphine prescribing for OUD: rural vs. urban comparison.

<table>
<thead>
<tr>
<th>Census Region</th>
<th>Percentage of counties with high-need and low-to-no-capacity for buprenorphine prescribing, among all counties</th>
<th>Percentage of counties with low-to-no capacity for buprenorphine prescribing, among high-need counties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Counties</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>0.5%</td>
<td>5%</td>
</tr>
<tr>
<td>South</td>
<td>29%</td>
<td>59%</td>
</tr>
<tr>
<td>Midwest</td>
<td>13%</td>
<td>57%</td>
</tr>
<tr>
<td>West</td>
<td>18%</td>
<td>48%</td>
</tr>
<tr>
<td><strong>Rural Counties</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>1%</td>
<td>14%</td>
</tr>
<tr>
<td>South</td>
<td>34%</td>
<td>67%</td>
</tr>
<tr>
<td>Midwest</td>
<td>14%</td>
<td>70%</td>
</tr>
<tr>
<td>West</td>
<td>21%</td>
<td>56%</td>
</tr>
<tr>
<td><strong>Urban Counties</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>South</td>
<td>21%</td>
<td>46%</td>
</tr>
<tr>
<td>Midwest</td>
<td>44%</td>
<td>36%</td>
</tr>
<tr>
<td>West</td>
<td>11%</td>
<td>31%</td>
</tr>
</tbody>
</table>

Sources: Buprenorphine-Waivered Providers - County Data (link: https://oig.hhs.gov/oei/maps/waivered-providers/index.html) and NCHS Urban-Rural Classification Scheme for Counties (link: https://www.cdc.gov/nchs/data_access/urban_rural.htm)
In rural communities, stigmatizing and negative attitudes about those who use drugs has been found in multiple sectors of the community including law enforcement, emergency medical service professionals, and a variety of health care professionals who also reported a lack of comfort/low self-efficacy in treating those with SUD. For those diagnosed with SUD, low uptake of MOUD is hindered by misconceptions regarding the implications and benefits of evidence-based OUD treatment medication protocols—a barrier particularly significant in rural areas lacking behavioral health treatment options. Overall, stigmatization represents a complex and persistent barrier to treatment, particularly in rural areas. Recognition of the role of stigma in diagnosis and treatment represents significant opportunity for changes and highlights the need for increased education and awareness to neutralize the pattern of stigmatization and shift the focus toward access, treatment, and recovery.

Spread of Infectious Diseases. The opioid epidemic has fueled outbreaks of HIV and HCV infections among people who inject drugs, with those in rural counties being most vulnerable. Policy changes to curtail the diversion of prescription drugs (illegal distribution or abuse of prescription drugs for purposes not intended by the prescriber) have increased the risk of overdose as well as HIV/HCV infections in rural America.

CONTRIBUTING FACTORS/KNOWN CAUSES OF THE CONDITION

Policy. There have been policy changes related to prescription opioids in response to the crisis such as efforts to decrease prescriptions and diversion to include prescription drug monitoring programs (PDMP), pain clinic laws, prescription duration limits, the disciplining of providers who prescribe disproportionate amounts of opioids, and ultimately the advent of abuse deterrent prescription opioid formulas. Prescription drug monitoring programs were intended to curtail nonmedical opioid use and diversion through the tracking of scheduled medications prescribed and dispensed. Yet, these policies have resulted in unintended consequences, specifically a transition of those who misuse prescription opioids to heroin, fentanyl or injection drug use. Dramatic escalation in heroin overdoses is associated with decreased opioid prescribing and, despite new guidelines and PDMPs, per capita opioid prescriptions are high in rural populations, especially among residents that are White, have diabetes and arthritis, and are unemployed.

Polysubstance Use. There is an increase in use of multiple substances while concurrently using methamphetamine and opioids, simultaneously as well as separately. While there is an increased risk of overdose both with cocaine and methamphetamine combined with opioids, methamphetamine pose the threat of overdose regardless of opioid use. Research has shown that the epidemic of opioid overdoses in rural America is associated with pervasive methamphetamine use among people using drugs. Rural residents are more apt to misuse multiple prescribed substances compared to urban polysubstance users who more often use illicit opioids. Healthcare providers have concerns in caring for individuals with polysubstance use. Polysubstance use has a significant impact on addiction treatment modalities, self-management of withdrawal symptoms, risk of overdose, and compensatory use with cigarettes, alcohol, and other illicit drugs such as methamphetamine.

SOLUTIONS/INTERVENTIONS/RECOMMENDATIONS

Community-based Solutions. Comprehensive community-based initiatives for those with addictions are needed. Rural community stakeholders can provide valuable inferences and solutions based on local experience to mitigate addiction for their communities. Examples include the need to address those that are homeless in rural areas and the importance of family and social support for resilience as well as risk factors. There is a need to increase community education about nonmedical opioid use, overdose and its reversal, and the benefits of harm reduction. Other services that can be facilitators for recovery from addiction in rural communities are medication-assisted treatment, peer recovery groups, rehabilitation centers, faith-based recovery programs, and long-term recovery programs.

Given the potential for continuation of substance use during recovery, the concept of continuity of
care can be applied by connecting those with SUD to recovery support services. There is a need to coordinate continuity of care following completion of formal treatment services, linking treatment to recovery support services that account for individual needs and community capacity.

Stigma prevention efforts in rural communities should aim to improve public knowledge on factors contributing to substance use and harm reduction programming’s moral and fiscal value. Education and training initiatives to improve health care providers’ attitudes, self-efficacy, and SUD assessment skills are needed to better serve rural Americans who use substances. Pharmacy naloxone dispensing may be an especially effective strategy to alter the overdose risk environment in rural communities.

**Expansion of Treatment Options.** Expansion of telemedicine, with options for rural patients, can help rural Americans with SUD connect with providers. Additionally, psychosocial approaches such as technology-assisted remote treatment options (telehealth) and peer support specialists (PSS) are low-cost, evidence-based options to explore for implementation in rural communities. These options may also decrease travel burden as well as facilitate medication treatment expansion among providers. Educational interventions are needed to train primary care practitioners—who are key providers of opioid use disorder treatment in the rural U.S.—how to better address multiple addictions such as methamphetamine use among people who use opioids.

**MOUD Treatment.** The critical need to expand access to medication treatment and emergency opioid-overdose reversal medications to rural communities has been identified. Established treatment standards for OUD include medications (buprenorphine, methadone, or naltrexone) and psychosocial treatment. However, treatment options in rural America are limited. Medication for the treatment of addiction, specifically OUD, is central to best practices and requires long-term management with a combination of treatments tailored to the individual. Methadone, buprenorphine, and naltrexone are currently the medications approved by the Federal Drug Administration to treat OUD. Long-acting buprenorphine injectables offer a solution to improve OUD treatment in rural areas which also improves treatment access and retention by decreasing risk of nonadherence, diversion, and misuse. Literature findings also consistently noted sociodemographic risk factors related to MOUD access intersecting with rural status, potentially exacerbated by rural-specific risks.

The implementation chasm (gap between scientific advances and their implementation) is wide for those with addiction in rural America, especially for MOUD. Education is needed for providers, people who use opioids, and the community at-large about the safety and efficacy of MOUD, and the dangers of detoxification and other contraindicated “drug treatments” that may decrease tolerance and increase overdose risk. Best practices for patients who use opioids nonmedically, become physically dependent, or develop an OUD are needed as guidelines and should include screening tools for referral of those in need of MOUD.

The Comprehensive and Addiction Recovery Act (CARA) of 2016 temporarily extended the ability for nurse practitioners and physician assistants to get a DEA waiver to prescribe buprenorphine (an MOUD). By the end of 2017, 30% of rural residents were living in a county without a buprenorphine provider, compared with only 2.2% of urban residents. In 2018, under the Substance Use-Disorder Prevention that Promotes Opioid Recovery and Treatment for Patients and Communities Act, the number of patients a provider could manage with buprenorphine prescriptions was increased and CARA became permanent. The need for a waiver to treat OUD was rescinded as part of the 2023 Consolidation Appropriations Act.

**Peer Support Specialists.** Peer support has shown to be successful in maintaining recovery for behavioral health conditions such as SUD with increased treatment retention, improved treatment satisfaction, and a reduction in relapse rates. The use of PSS or recovery coaches brings the lived experience of recovery, combined with training and supervision, to assist others in initiating and maintaining recovery. PSS help enhance the quality of personal and family life in long-term recovery and is a promising approach.
for resource-poor areas. Recovery coaches help persons with SUD to connect to, engage in, and be active participants in treatment and recovery support services, decrease substance use, increase engagement with medical care, and increase day-to-day function. The operationalization and effectiveness of PSS in low-resource populations lacks appraisal, but is a promising and viable strategy to implement and adopt in the wake of the COVID-19 pandemic.

**Harm Reduction Strategies.** Harm reduction and SUD treatment interventions should aim to address methamphetamines, as well as opioids, to combat overdoses in rural communities. Policies differ across rural America related to harm reduction as state-level policies regulate harm reduction activities. Interventions with the strongest evidence include PDMPs and pain clinic legislation, insurance strategies, motivational interviewing in clinical settings, feedback to providers on opioid prescribing behavior, intensive school and family-based programs, and patient education in the clinical setting. More research in rural communities is needed on strategies to prevent overdose that include public, patient, and provider behavior. It is imperative for programs aimed at youth and adolescents to target and highlight the misuse of opioids as substances that are highly addictive and can lead to the use and abuse of other substances.

**SUMMARY AND CONCLUSIONS**

Continued investigation, and interventions that emphasize environments which better conditions underpinning increased risk, are critical. In general, rural Americans are at-risk and understudied in relation to the opioid epidemic. This chapter highlights drug use in rural America, as the opioid epidemic is certainly on the forefront of addiction concerns. The need is great for stronger partnerships among the medical community, increased access to substance use treatments, and collaborative public health organizations to better support rural communities.

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**Related Chapters:**
Chapter 1. Mental Health and Mental Disorders: A Rural Challenge
Chapter 5. Rural Substance Misuse Trends in America
Chapter 20. The Issue of Chronic Pain in Rural America

**Suggested Chapter Citation:**
RURAL HEALTHCARE ACCESS AND QUALITY

By Timothy Callaghan, PhD; Kristin Lunz Trujillo, PhD; Alee Lockman, PhD, MPH; and Gogoal Falia, MBA, MBBS

SCOPE OF THE PROBLEM

- The number of Americans with health insurance increased significantly during the decade of evaluation for Healthy People 2020, in large part due to the passage of the Patient Protection and Affordable Care Act (ACA).1-3
- For the first time across three decades of research, healthcare access and quality is no longer the top Rural Healthy People priority. For Rural Healthy People 2030, it has dropped to third, likely due to insurance gains over the past decade.4,5
- In 2010, 23.7% of rural Americans and 21.6% of urban Americans were uninsured. By 2019 those numbers had dropped to 16.0% and 12.9% respectively.6
- More than 140 rural hospitals have closed in the United States since 2010. This has been accompanied by the closure of certain services (i.e., obstetrics) in rural hospitals that remain open, as well as a troubling number of health professional shortage areas in rural communities.7-9
- Ten states have elected not to expand Medicaid under the ACA, resulting in an uninsured rate of 6.6% in Medicaid expansion states and 12.7% in non-expansion states as of 2021. Importantly, many holdout states have large rural populations including Texas, Florida, and Georgia.10,11
- The COVID-19 pandemic exacerbated challenges with healthcare access and quality. Many Americans lost their jobs (and job-based insurance), pushing them towards Medicaid. They also were forced to confront overstrained hospital systems and provider shortages which served to reduce both access and quality of care.12-15
- Innovations in telehealth over the past decade,16-19 and telehealth policy changes in light of the COVID-19 pandemic, have made telehealth a more viable strategy to increase healthcare access.20-21 With that said, challenges tied to broadband internet access and access to devices have slowed telehealth-based progress in improving health access in rural communities.22,23
- Rural Americans are more likely to be enrolled in (and to be unsatisfied with) traditional fee-for-service Part D Medicare prescription drug benefits. They are also less likely to have access to a Medicaid-contracted pharmacy.24,25
- Rural America continues to experience regional and racial disparities in different facets of health-care access. Regions of particular concern include the South, Mountain West, and Great Plains.26-28

Over the past decade in the United States, we have seen remarkable changes in healthcare access and quality. As recently as 2010, there were 48.2 million non-elderly (under 65) Americans without access to health insurance.1 By the end of the decade, that number had dropped substantially to 30 million uninsured individuals even as the U.S. population grew over that period from roughly 309 million Americans to 331 million Americans.1,29 This drop in the uninsured rate has been observed in both rural and urban communities. In 2010, 23.7% of rural Americans and 21.6% of urban Americans were uninsured. By 2019 those numbers had dropped to 16.0% and 12.9%, respectively.6 However, these gains have been uneven across rural and urban areas, with the gap between uninsured rates in rural and urban America increasing from 2.1% to 3.1% over that period.6
These improvements in healthcare access and quality are attributable in large part to the passage of the Affordable Care Act (ACA) in 2010. Dramatic coverage improvements were achieved by providing financial support to states that expanded their Medicaid programs, issuing premium credits to Americans making less than 400% of the federal poverty level to purchase insurance, allowing children to stay on their parents’ health plans until age 26, and mandating the coverage of essential health benefits. Importantly however, the Supreme Court’s 2012 decision in NFIB v. Sebelius made state expansion of Medicaid under the ACA optional, resulting in uneven gains in healthcare access for low-income adults. To date, ten states have elected not to expand Medicaid, resulting in a disparate uninsured rate of 6.6% in expansion states compared to 12.7% in non-expansion states as of 2021. Notably, many holdout states have large rural populations, including Texas, Florida, and Georgia.

Beyond the passage of the ACA, healthcare access and quality have been substantially impacted by the COVID-19 pandemic. In the first year of the pandemic, rural “employment dropped to 92% of 2007 levels, lower than at any point in the Great Recession.” With most non-elderly Americans relying on employment for insurance, this put considerable strain on healthcare access in the U.S. Simultaneously, the pandemic has made access to high quality health care more difficult. Issues tied to provider shortages and hospital closures in rural communities were exacerbated by the pandemic, which took up hospital beds and added stress to already burned-out providers, making it difficult for individuals to access needed quality care. Notably, the pandemic also increased utilization of telehealth, which could result in significant shifts towards its use in rural communities over the next decade.

HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

Given the importance of healthcare access and quality to the health of all Americans, this topic has been and will continue to be central to the work of providers, practitioners, and researchers. Improvements in this domain have clear and direct impacts on morbidity and mortality in the U.S. and can be made in a number of ways including through policies to decrease the uninsured rate, efforts to improve care provided to patients, and by addressing the social determinants of health that have been increasingly recognized as central to health over the past decade. This centrality of access to health care is exemplified through the efforts of the Healthy People 2030 initiative, which includes 49 distinct objectives focused on healthcare access and quality.

For the purposes of this review chapter, we will focus on the following Healthy People 2030 goals and objectives tied to healthcare access and quality:

- Increase the proportion of people with health insurance — AHS 01
- Increase the proportion of people with prescription drug insurance — AHS 03
- Reduce the proportion of people under 65 years who are underinsured — AHS R03
- Increase the use of telehealth to improve access to health services — AHS R02
- Reduce the proportion of people who can’t get medical care when they need it — AHS 04

In the area of health insurance, the baseline was 88% of persons under 65 having health insurance in 2019, with a goal of 92.4% by 2030. Similarly, the U.S. hopes to increase its prescription drug insurance coverage for persons under 65 from 82.1% to 89% and to reduce the proportion of people who can’t get care when they need it from 8.5% to 5.9%. At the same time, Healthy People 2030 will serve as an opportunity to begin research into underinsured rates as well as telehealth, both topics with important implications for the future of healthcare access and quality in the U.S.

RURAL HEALTHY PEOPLE 2030 SURVEY

The Rural Healthy People 2030 survey of rural stakeholders across the U.S. identified “health care access and quality” as the third most important priority for rural America over the next decade. This is the first time across three decades of Rural Healthy People that healthcare access is not the number one rural health priority as identified by rural stakeholders. This relative drop in importance is likely attributable,
at least in part, to important gains in health insurance in the U.S. over the past decade. While there were over 48 million uninsured Americans at the launch of the Healthy People 2020 initiative in 2010, that number had dropped to 30 million uninsured by 2020, despite gains in the size of the U.S. population.1

Critically, we must recognize that despite this drop in relative importance, health care access and quality remain vital for the health of rural Americans and remain an important priority for rural stakeholders. This finding is largely consistent across subgroups within the U.S. population. Health care access and quality is the third highest priority in both Medicaid expansion and non-expansion states, among both male and female stakeholders, across stakeholder age, and within most stakeholder industries.4 With that said, the priority does drop slightly to the fourth most important priority among stakeholders in the Northeast and South, stakeholders working in both the healthcare and human services sectors, as well as among stakeholders specifically working in rural hospitals and federally qualified health centers.4

PREVALENCE AND DISPARITIES IN RURAL AREAS

While considerable gains in healthcare access and quality have been made over the past decade, persistent disparities remain between rural and urban communities. Rural residents are more likely to live in areas with lower median incomes, to be older, to have more chronic conditions, and to be uninsured or underinsured.5,43 Perhaps unsurprisingly then, research has found that rurality is associated with higher mortality rates in general, including deaths in hospital settings and for a number of chronic conditions.43,44 Although the ACA was responsible for significant improvements in healthcare access, relative insurance gains and reductions in cost-related barriers to care were larger in urban communities.45 Simultaneously, the ACA has been associated with access to a regular source of medical care and doctor visits in urban but not rural communities.45

These larger improvements in urban as opposed to rural areas after the implementation of the ACA could be attributable at least in part to countervailing forces on rural healthcare access. Most importantly, there have been over 140 rural hospital closures since 2010 and 65.8% of health professional shortage areas are located in rural communities.7,46 As a result, rural communities are less likely to have access to obstetric services and must travel greater distances to access any form of healthcare services.8,9,47,48 This places higher burdens on rural communities and makes it harder for rural residents to get medical care when they need it. In the area of prescription drugs, rural residents have unique challenges in accessing needed medications. They were more likely to be enrolled in traditional Part D Medicare prescription drug plans with concomitant lower levels of satisfaction, were less likely to have access to a Medicaid-contracted pharmacy, and were less likely to have in-person visits for the prescription drugs they were taking.24,25,49

Many policymakers and practitioners have pointed to telehealth as a potential path forward for eliminating some of these disparities, and important gains in rural telehealth use were seen during the pandemic.20,21 Unfortunately, rural-urban disparities in telehealth access and utilization persist. Inherently, patients need access to the internet and to electronic devices to participate in telehealth services. Importantly, however, 57.1% of Americans without broadband access live in rural areas.22 Furthermore, rural households are more likely to lack access to any digital devices.23 In addition, rural hospitals are less likely than urban hospitals to have telehealth systems with patient engagement capabilities and, after COVID-19 telehealth policy expansions, there was actually an 11% decrease in telehealth visits from very high vulnerability regions including some rural communities.17,20

VARIATION BY RURAL REGIONS

The rural U.S. also continues to experience regional disparities in healthcare access, with particular concern in the South, the Mountain West, and the Great Plains. For instance, southern states have the lowest levels of health insurance coverage and the highest out-of-pocket costs, followed by western states, the Midwest, and then the Northeast.20 These high uninsured rates in the South can be explained in part by the large number of southern states that
have not expanded Medicaid under the ACA. Furthermore, urban-rural disparities in health insurance coverage within states tend to be highest in the South, the Rocky Mountain states, and the Great Plains. Conversely, urban-rural disparities tend to be lowest in the Great Lakes region and the Northeast. Mountain states and parts of the South also experienced a widening urban-rural disparity in the rate of uninsured Americans between 2013 and 2017, compared to the rest of the country.

Similarly, telehealth capabilities vary across regions in rural areas. Although hospital closures are more prevalent in rural areas, rural hospitals in certain regions are disproportionately more likely to possess telehealth capabilities – particularly in the Rocky Mountain states, the Great Plains, and the Upper Midwest. The use of telehealth services may be mitigated by several factors, however, such as a lack of broadband access that is more prominent in the Great Plains and the South.

**VARIATION BY RACE AND ETHNICITY**

There are also considerable disparities in healthcare access and quality based on race and ethnicity. As of 2019, rural Hispanics and American Indians/Native Americans continued to lag behind White rural residents and urban residents in health insurance coverage, including postpartum coverage within the first half year after childbirth. In Medicaid non-expansion states, low-income adults – who are disproportionately Black and rural – have worse health outcomes than their counterparts in Medicaid expanding states. Even after Medicaid expansion, however, racial disparities in the uninsured rate among rural residents remain in expansion states.

In addition, non-White rural residents were more likely to have reported not being able to see a physician in the past 12 months because of cost, compared to White rural residents. Non-White rural residents are also at greater risk of experiencing a hospital closure, compared to White rural residents, though this difference may be accounted for by insurance rates and economic factors like the unemployment rate. With that said, some disparities across race and ethnicity are not necessarily accounted for by other health-based or socio-demographic factors. For instance, certain groups of non-White rural residents – such as Spanish-speaking Hispanic farmworkers in rural communities – face unique barriers to healthcare access and services that standard brick and mortar models inadequately address.

Telehealth and online services also have racial and ethnic disparities within rural areas. Although the proportion of urban, suburban, and rural Americans with internet access has increased over the decade, rural residents overall continue to lag behind non-rural residents in broadband and online access. In particular, non-White rural residents are less likely than White rural residents to have access to broadband internet.

**IMPACT ON MORBIDITY AND MORTALITY**

Chronic health conditions and associated morbidity and mortality are more prevalent in the rural U.S., with limited healthcare access compounding these issues. Healthcare access, morbidity, and mortality are all jointly shaped by factors like socioeconomic deprivation, physician shortages, and a lack of health insurance. The root cause of many of these issues is ultimately state-level policy decisions, including policy choices tied to Medicaid expansion, investment in healthcare infrastructure, and economic policy decisions. While the ACA has certainly improved healthcare access and, in turn, reduced the number of uninsured while improving healthcare quality and outcomes, disparities persist. Research has shown that rural insurance enrollees from racial and ethnic minority groups have lower access to timely primary and preventive care compared to their urban counterparts. Furthermore, mortality among uninsured rural patients in trauma centers is five times higher than for rural patients with commercial insurance.

Compared to those in urban areas, rural Americans generally utilize health care less, fill fewer prescriptions, and pay more out-of-pocket costs for care. Hospital closures, which have occurred frequently over the past decade in rural America, are also associated with decreased access to care, with important consequences for morbidity and mortality. For example, a study in Texas found that between 2014-2019, rural
hospital closures significantly reduced outpatient and emergency department utilization. Approximately 45% of rural counties in the U.S. have no hospital obstetrics services, hindering obstetric and routine primary care, especially for those living in states with lower Medicaid income eligibility thresholds. In addition, evidence suggests that rural women report fewer routine primary and prenatal care behaviors, including obstetrician visits and pre-pregnancy dental visits, which can contribute to chronic illness and pregnancy complications resulting in increased morbidity and maternal mortality.

Low-income rural adults are also less likely to receive flu vaccinations and blood pressure checks, which are important to prevent morbidity and mortality. In addition, rural communities experience a shortage of mental health services, despite experiencing higher mortality rates due to behavioral health challenges, including substance use, alcohol, and suicide. While telehealth may be a viable treatment option for meeting many rural mental health needs, limited coverage networks, low reimbursement rates, state licensure restrictions, and inadequate broadband access, among wider policy changes, hinder the effective implementation of telehealth to improve access across rural America.

Rural Americans also are less likely than those in non-rural communities to receive routine dental care. Poor oral health is associated with serious illnesses like cardiovascular disease, certain types of cancer, pneumonia, dementia and Alzheimer’s disease, and birth complications. In addition, inferior access to preventive dental care among rural children makes them susceptible to these long-term morbidities and mortalities. Similarly, having a usual source of care is associated with an 11% increase in the probability of having a preventive dental checkup within a year; however, rural adults have significantly lower odds of having one dental checkup per year and of having a usual source of care, compared to their urban counterparts.

**BARRIERS TO ACCESS AND KNOWN CAUSES OF THE PROBLEM**

While rural uninsured rates have declined over the past decade, rural Americans still disproportionately face barriers to accessing quality health care and affordable health insurance. Rural Americans are poorer than their urban counterparts and more likely to report delaying care, or not obtaining prescription medications, due to cost. Those living in rural areas have also experienced persistently higher unemployment rates following the onset of the COVID-19 pandemic, limiting access to employer-sponsored insurance.

Rural Americans have experienced the greatest gains in insurance coverage under the ACA expansion of Medicaid coverage. However, in non-expansion states, many low-income rural Americans still lack access to health insurance; the rural uninsurance rate is nearly twice as high in non-expansion states versus expansion states. This higher uninsured rate can be attributed to rural America having fewer large employers mandated to provide health insurance under the ACA, the large number of rural employers not offering any insurance, and the fact that rural Americans are more likely to participate in part-time, seasonal, or agricultural jobs without benefits.

In addition to coverage challenges, numerous logistical barriers – including inadequate provider networks, distance to medical facilities, and lack of reliable transportation – also limit rural Americans’ access to timely, quality healthcare services. While most rural Americans have access to primary care locally, many rural residents must travel considerable distances to reach specialty or hospital care, making access more difficult. These access barriers have been exacerbated by the large number of rural hospital closures and provider shortages over the past decade. For many, this has increased the distance to needed care while simultaneously overburdening those providers that do remain in rural America, negatively impacting the quality of care they can provide. Recent studies have found that rural hospital closures are associated with decreased utilization of both outpatient and emergency departments, as well as overall reductions in the rural primary and specialty provider workforce. While telehealth holds potential for expanding specialty and behavioral healthcare access in rural regions, technology limitations remain.
half of all Americans lacking broadband access reside in rural regions.\footnote{22}

Although rural educational attainment has increased in recent years, rural Americans still lag behind their urban counterparts in both high school and college completion,\footnote{22} and health literacy overall is lower in rural areas.\footnote{78-79} Combined with technology limitations, these factors may hinder rural Americans’ ability to navigate the healthcare system, limit their access to health information, and affect the quality of communication between providers and rural patients.\footnote{80}

**POTENTIAL SOLUTIONS OR INTERVENTIONS**

To improve healthcare access and quality in rural communities, policy interventions are needed across a number of different domains at both the state and federal levels. To begin, considerable gains in rural healthcare access could be made through continued Medicaid expansion under the ACA. To date, over two million Americans fall into the coverage gap – making too much money to qualify for ACA marketplace subsidies, and too little to qualify for Medicaid in the states that have not expanded Medicaid.\footnote{11,81} By following the lead of other conservative states like Oklahoma, Missouri, Utah, Nebraska, and South Dakota in expanding Medicaid, the remaining states could impactfully expand healthcare access for poor rural Americans.\footnote{11}

In addition, improvements in rural healthcare access could be made in the area of telehealth. The COVID-19 pandemic saw dramatic expansions to telehealth permissibility in state and federal laws, but the majority of these actions were temporary and set to expire with the end of the COVID-19 public health emergency. Federal legislation passed at the end of 2022 extended many of these telehealth provisions an extra two years, but efforts to codify permissive telehealth provisions into permanent law would be a boost to rural healthcare access.\footnote{82}

Beyond Medicaid expansion and changes in telehealth law, policy efforts to slow the pace of rural hospital closure are vital. One potential path to supporting rural hospitals that remains is the rise of Rural Emergency Hospitals (REHs) – a new hospital designation launched by the Centers for Medicare and Medicaid Services on January 1, 2023.\footnote{83} Rural facilities with the REH designation will receive enhanced Medicare payments in return for providing 24-hour emergency and observation services with the option to provide outpatient services.\footnote{84} Critically, these REHs will be expected to close their non-emergency inpatient services and lose access to the 340B drug pricing program, which has led to some criticism and questions about how effective the new hospital type will be.\footnote{85} While it is too soon to gauge the impact of this new program, the hope is that it will help to sustain the more than 450 rural hospitals that have been identified as at-risk of closing. Given the dire need to prevent further rural hospital closures, other models of care and financial support for rural hospitals should also be explored.\footnote{86}

Finally, continued policy interventions are needed in the area of prescription drugs to improve access and reduce costs. The passage of the Inflation Reduction Act in 2022 should provide some relief by allowing the federal government to negotiate the prices of a limited number of drugs in Medicare, capping out-of-pocket spending for Medicare Part D enrollees, and expanding benefit eligibility in the Medicare Part D Low Income Subsidy Program, among other changes.\footnote{87} With that said, changes outside of the Medicare program are still needed. Policy efforts to reign in the ever-rising cost of prescription drugs and to make coverage itself more affordable for those who need it should be a policy priority over the next decade.

**SUMMARY AND CONCLUSIONS**

The past decade has been a period of considerable improvement in healthcare access and quality in the U.S. The passage of the ACA has allowed millions of Americans to access affordable health insurance for the first time. This, in turn, has allowed more Americans to access needed healthcare services while reducing burdens on certain parts of the health sector that previously had to provide large amounts of uncompensated care. Gains tied to the ACA have been supplemented by improvements in technology and policy that have allowed more Americans than ever to access care through telehealth, improving the proportion of Americans who can get care when they need it.
Importantly, however, disparities in healthcare access and quality remain. Rural Americans remain less likely to hold health insurance, while also being more likely to travel greater distances to care, face more health professional shortage areas, and confront more hospital closures. They are also less likely to have the internet and device access necessary to make telehealth viable. However, rural Americans are not alone in facing considerable healthcare access challenges—minority groups across the U.S. face many of these same barriers, as well as individuals living in states that have not expanded Medicaid under the ACA.

Overcoming these disparities will require continued efforts at policy change over the next decade. The expansion of Medicaid in the remaining states that have yet to expand would be the quickest and among the most impactful ways to improve healthcare access. Efforts are also needed to continue to improve internet coverage, and in turn, telehealth access in rural communities. Equally important, policymakers need to continue to work towards reducing health professional shortage areas in rural communities, to bolster rural hospitals against closure and to lower the price of prescription drugs. Efforts in these areas are already underway in the form of REHs and prescription drug provisions within the Inflation Reduction Act. These policies will need to be closely monitored over the next decade to gauge their impact on the lives and health of rural Americans.

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Related Chapters:
Chapter 8. Preventive Care for Rural Populations and Providers: Routine Screenings, Prenatal Care, and Oral Health
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Chapter 15. An Examination of the Workforce in Rural America
Chapter 17. Health Insurance for Rural Americans
Chapter 19. Hospital and Emergency Services in Rural Areas

Suggested Chapter Citation:
Obesity and Physical Activity in Rural Settings

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Scope of the Problem

- Obesity and physical inactivity remain leading chronic disease risk factors in the United States.
- The U.S. adult obesity rate is over 40% and has increased by more than 25% since 2008.1
- Obesity prevalence is significantly higher among adults living in nonmetropolitan (i.e., rural) counties than among those living in metropolitan counties.2
- Rural children have 26% greater odds of obesity compared to children residing in urban areas.3
- Only one in five (19.6%) rural adults meet the U.S. Physical Activity Guidelines for Americans, significantly less than their urban counterparts.4
- The medical costs of obesity among adults exceed $250 billion dollars per year.5

Obesity prevalence is consistently higher in rural communities compared to urban areas. In 2016, analysis of the Behavioral Risk Factor Surveillance Survey (BRFSS) showed that obesity rates for adults living in nonmetropolitan counties (34.2%) were higher than for adults living in metropolitan counties (28.7%).2 Additionally, people living in rural areas, regardless of race, were more likely to be obese and less likely to be physically active than people in more urban areas.2 While obesity and physical inactivity have long been recognized as major public health risk factors,3 it was not until 2020 with the onset of the COVID-19 pandemic that it became clear how important they were. Both obesity and physical inactivity were found to be significant risk factors for developing severe COVID-19 linked to higher rates of mortality.5,7 In addition to COVID-19, people with obesity are at increased risk for a variety of adverse health conditions including high blood pressure, type 2 diabetes, stroke, coronary heart disease, osteoarthritis, sleep apnea, and several types of cause and all-cause mortality.8 Despite a myriad of public health communications and interventions, obesity rates have continued to steadily rise across the U.S. since the 1970s. By 2017-2018, the National Health and Nutrition Examination Survey (NHANES) found adult obesity prevalence to be 42.4%.9 The medical costs of obesity exceed $250 billion dollars per year, and the costs for adults with obesity was over $2,500 higher per year than their normal-weight peers.5

These findings are similar for rural youth. A meta-analysis of studies with children ages two to 19 found that rural children have 26% greater odds of obesity compared to urban children.3 An additional study found that this disparity existed even after controlling for physical activity and dietary patterns, indicating the need to examine additional factors to address these differences.10

Physical inactivity is a major risk factor for obesity. However, it is also an independent risk factor for several health outcomes, including heart disease, type 2 diabetes, and some forms of cancer.11 Getting adequate physical activity also provides benefits including better sleep and cognitive ability, as well as increased ability to perform everyday tasks.12

The most recent national Physical Activity Guidelines for Americans was released in 2018.13 The guidelines recommend 60 minutes a day of aerobic exercise for youth, with three days of bone and muscle strengthening activities. For adults, 150 minutes a week of moderate to vigorous
physical activity, with two days a week of muscle strengthening activities, is recommended. Despite these benefits, more than three-quarters of American adults and 77% of high school students do not get enough aerobic physical activity. In 2017, only one in four (25.3%) urban residents and one in five (19.6%) rural residents met the combined guidelines.

In general, rural residents are less physically active than their urban counterparts and are also disproportionately affected by chronic diseases and conditions associated with caloric imbalance, which included obesity. High levels of sedentary behavior, an associated but independent risk factor from inadequate physical activity, has been linked to lower health-related quality of life, stress, anxiety, depression, cardiovascular disease, and all-cause mortality. While the national Physical Activity Guidelines for Americans addressed the importance of reducing sedentary time for adults, no targets were established. There is some preliminary evidence that rural children, but not adults, engage in more sedentary time than their urban counterparts.

While awareness of the dual epidemics of inadequate physical inactivity and obesity had increased in the early 2000s, the COVID-19 pandemic overshadowed most other public health issues between 2020 and 2022. With COVID-19 likely to become an endemic issue through much of the world, physical inactivity and obesity will remain important risk factors. By addressing these risk factors, we can help create a population that is more resilient to future pandemics and other chronic diseases.

HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

A U.S. Department of Health and Human Services’ initiative, Healthy People, has for several decades established goals and objectives to improve the health and well-being of all Americans. The overall goal in the current decade, for the leading health indicator Overweight and Obesity, is to “reduce overweight and obesity by helping people to eat healthy and get adequate physical activity.” The Healthy People 2030 objectives for this topic are focused on helping people maintain a healthy weight through healthy eating and active living. The physical activity objectives in Healthy People 2030 encourage Americans to get active in a variety of safe and accessible settings.

Specific objectives of Healthy People 2030 related to obesity and physical activity that will be addressed in this chapter are:

**Obesity Objectives**:
1. Reduce the proportion of adults with obesity — NWS-03
2. Reduce the proportion of children and adolescents with obesity — NWS-04
3. Increase the proportion of health care visits by adults with obesity that include counseling on weight loss, nutrition, or physical activity — NWS-05

**Physical Activity Objectives**:
1. Increase the proportion of adults who do enough aerobic physical activity for substantial health benefits — PA-02
2. Increase the proportion of adults who do enough aerobic and muscle-strengthening activity — PA-05
3. Increase the proportion of adults who walk or bike to get places — PA-10
4. Increase the proportion of childcare centers where children aged 3 to 5 years do at least 60 minutes of physical activity a day — PA-R01

**Physical Activity Adolescent Objectives**:
1. Increase the proportion of adolescents who do enough aerobic and muscle-strengthening activity — PA-08

**Child and Adolescent Development Objectives**:
1. Increase the proportion of children who do enough aerobic physical activity — PA-09
2. Increase the proportion of adolescents who walk or bike to get places — PA-11
3. Increase the proportion of children aged 2 to 5 years who get no more than 1 hour of screen time a day — PA-13

RURAL HEALTHY PEOPLE 2030 SURVEY

A Rural Healthy People (RHP) 2030 survey, conducted by Texas A&M University, ranked overweight and obesity as the fourth highest priority for rural stakeholders. Responses were
slightly different across U.S. census regions, with the Northeast and West regions ranking obesity in fifth place, while the South and Midwest ranked it in third place. This is in line with data from the BRFSS which showed that obesity rates were highest in the South (32%) and Midwest (31.4%).

Physical activity was ranked 26th in the RHP 2030 survey. However, it is covered in this chapter since it is a major determinant of obesity. Nutrition and healthy eating behaviors, other major determinants of obesity, are covered separately in Chapter 6 of this volume.

**OBESITY PREVALENCE AND DISPARITIES IN RURAL AREAS**

**Adults**

Obesity is measured based on delineations of the body mass index (BMI). The BMI uses measures of height and weight. The formula is weight in kilograms divided by the height in meters squared. Individuals with a BMI > 30 are considered obese and those with a BMI between 25 and 30 are considered overweight. The two main surveillance systems that measure adult obesity are the NHANES and the BRFSS. While the NHANES uses objective measurements of height and weight, the BRFSS uses self-reported data. Compared to NHANES, the BRFSS has been found to underestimate obesity by about 10%.

According to 2016 BRFSS data, adult obesity rates were 19% higher in rural regions than they were in metropolitan areas. More than one-third (34.2%) of adults in rural areas had self-reported obesity, compared with 28.7% of metropolitan adults. Similar disparities are seen for physical activity. Between 2008 and 2017, the percentage of urban adults meeting physical activity guidelines increased from 19.4% to 25.3%, while the percentage of rural adults meeting the guidelines increased from 13.3% to 19.6%.

**Variations by Region**

Obesity rates differ dramatically across the U.S., ranging from a 25.0% obese population in Hawaii to 40.6% in West Virginia. In 2016, obesity prevalence among nonmetropolitan regions was highest in the South at 36.6%, followed by the Midwest (34.2%), Northeast (31.8%), and West (28.6%).

In addition to state and regional differences, differences within states between urban and rural counties have also been observed. Some of the biggest differences in obesity prevalence between counties were found in the South and Northeast regions. For example, the obesity rate in Fulton County, Georgia (an urban county, home to Atlanta) was 29%, which is below the national rate of 32% and well below the rate of 41% in Georgia’s rural Stewart County. Figure 1 shows obesity rates as assessed by analysis of the BRFSS in 2021. The highest levels of obesity can be seen stretching from Oklahoma and Texas through the south and up through the Appalachian region.

Similarly, an analysis of NHANES data by the Centers for Disease Control and Prevention (CDC) found that adults living in the most urban areas of the country (i.e., large metropolitan statistical areas) had the lowest obesity rates.

Physical activity trends follow obesity trends. In 2017, only 14.7% of Southern adults met physical activity guidelines. This was lower than adults living in the Midwest (19.9%), Northeast (24.2%), and the West (25.4%). While physical activity increased by 5%-9% between 2008 and 2017, for urban and rural adults residing outside of the southern U.S., this increase was not seen in the South where compliance only increased from 13.2% in 2008 to 14.7% in 2017.

**Youth and Children**

Obesity is measured differently in children than in adults. While BMI is calculated the same, the thresholds are relative to other children of the same age and sex using the CDC growth charts. The percentile thresholds are > 95% weight by height for obesity and 85%-95% weight by height for overweight.

Children living in rural areas are more likely to be obese than their urban counterparts. A meta-analysis found that rural children had 26% greater odds of being obese compared to their urban counterparts. Differences in obesity rates in rural versus urban children have been observed in children as young as three- to four-year-olds. However, one study examining NHANES data showed that rural children ages two to II reported higher levels of physical activity and higher calorie consumption that their urban counterparts.
During the COVID-19 pandemic, children and youth were less physically active and gained weight at a faster rate than during non-pandemic periods. Across 29 clinics in Pennsylvania, for example, childhood obesity increased from 13.7% in 2019 to 15.4% in 2020. The prevalence of overweight and obesity in school-aged children in rural areas of California, Kentucky, Mississippi, and South Carolina ranged from 37% to 60%, with children living in Kentucky having the highest prevalence. Nonmetropolitan Black youth had the highest risk of obesity (26%), an 86% rate of consuming fatty snack foods more than two days per week, and a 91% rate of spending more than two hours per day in screen time compared to White metropolitan youth.

Health literacy disparities among rural Appalachian children are prevalent, which then leads to differences in fruit and vegetable intake. Significant group differences in daily fruit and vegetable intake have been found among the lowest 20th, 30th, and 40th percentiles. A 2021 study of rural children found that on school days children had more physical activity, less sedentary time, and less screen time than on non-school days, indicating the importance of interventions aimed at times when children are not in school. Another study examining the effect of income on physical activity found that rural children who paid full price for lunch were four times more likely to participate in youth sports compared to children who receive free or reduced lunch.

**Gender and Race Ethnicity**

A study using NHANES data found that rural Black adults (49.6%) had the highest rate of obesity, followed by rural Hispanic adults (38.6%) and rural White adults (34.2%). An interaction was found between race and rurality, such that disparities between Black and White residents were increased in more rural areas. Men (37.7%) were more likely to be obese than women (33.4%). For physical activity, rural Hispanic adults (12.4%) were the least likely to get adequate physical activity compared to White, non-Hispanic rural adults (19.5%) and Black adults (17.9%). Rural Black adults had the biggest increase (7.7%) in the percentage of people meeting guidelines between 2008-2009 and 2016-2017 compared to only 1.4% for rural Hispanic adults. Men (21.1%) were more likely to meet physical activity guidelines than women (16.3%).
Racial and ethnic differences in obesity also exist for children. As reported from 2017-2020 NHANES data, obesity prevalence was 26.2% among Hispanic children, 24.8% among non-Hispanic Black children, 16.6% among non-Hispanic White children, and 9.0% among non-Hispanic Asian children.  

**Built Environment**

The built environment, or lack thereof, is one of many contributing factors to the obesity prevalence among rural Americans. Rural residents may have limited access to outdoor activities and spaces for exercise, with these spaces possibly being poor quality as well. Additionally, rural communities face barriers to healthy food options, such as farther distance from grocery stores where healthier food options are available. Food options available within rural communities are often convenience stores where healthier options are not readily available. Looking at the influence of built environment from a qualitative perspective, adults in rural Montana indicated that investments were needed in pedestrian-friendly features and that the lack of quality sidewalks were a barrier for those seeking to walk as a form of exercise. Beyond the barriers to physical activity, themes surrounding geographic isolation from healthier food options also demonstrate how built environment further contributes to the obesity prevalence among rural Americans.

A systematic literature review on the built environment found strong evidence for a positive association between traffic-related air pollution (nitrogen dioxide and nitrogen oxides exposure) and childhood obesity, while built environment characteristics supportive of walking (street intersection density and access to parks) was associated with lower rates of childhood obesity. Within rural communities, the presence of a town center has been linked with higher levels of physical activity. Another study found that home and church settings in rural communities provided both physical and social support for physical activity. Inactive rural women reported less access to a place where they could be active and a lesser belief in the relevance of physical activity to health than their more active peers.

**BARRIERS**

There are a variety of barriers to a healthy diet and exercise in rural areas, as well as access to counseling and weight loss programs, including:

**Healthcare Resources**

- Many rural counties are in primary care professional shortage areas
- Significant deficits exist in space and trained staff for teledmedicine
- Lack of reimbursement for healthy behavior change programs and services
- Lack of clinician knowledge and pediatric subspecialists
- Lack of health insurance

**Healthy Eating**

- Higher price of healthy foods, which prevents rural residents from purchasing these healthy foods and preparing nutritious meals
- Distance to grocery stores that have healthy food options and related considerations for spoilage and waste
- Accessible convenience stores with limited selection of healthy foods
- Food deserts and swamps
- School-based nutrition policy
- Sociocultural normative behaviors, attitudes, and expectations regarding preferred and acceptable foods

**Physical Activity**

- Lack of motivation
- Physical environment
- Sociocultural barriers
- Safety
- Long work hours, lack of transportation, increased screen time

**COMMUNITY MODELS KNOWN TO WORK**

**Obesity Counseling Interventions**

Given that many rural Americans have indicated that distance to medical treatment and limited availability of providers have deterred them from receiving the care that they need, telehealth may be an effective tool in obesity management and treatment. The use of telehealth among rural Americans has led to improvements in diet,
activity levels, and favorable changes in weight.\textsuperscript{52} A clinical randomized trial conducted by the U.S. Cooperative Extension Service offices found that providing individual telephone counseling for weight management in rural communities led to >10\% weight reductions than those in a control group.\textsuperscript{63} Utilization of telehealth has not only improved obesity counseling among adults in rural America, but children as well. A systematic review looking at the effectiveness of clinic-based telehealth versus face-to-face modalities found that the telehealth option showed a reduction in BMI as well as improvement in eating habits, physical activity, and patient satisfaction.\textsuperscript{64}

**Community-Based Behavioral Interventions**

Additionally, community-based interventions have been successful in addressing not only obesity, but physical activity as well. Community-based interventions provide accessible means of exercise and provide knowledge on exercise and proper nutrition. Two examples of evidence-based community programs are Strong Hearts, Healthy Communities (SHHC) and Play Streets. Additional emerging programs are also being studied under the Center for Disease Control and Prevention (CDC) High Obesity Funding program.

Strong Hearts, Healthy Communities is a community-based program that addresses cardiovascular risk in midlife and older overweight and obese women in rural communities.\textsuperscript{65} The program seeks to address cardiovascular risk factors including weight loss and management; improved dietary intake patterns; increased physical activity; reduced sedentary behavior; and tailored, intentional engagement strategies in social and built environments to support these changes. In a randomized community-based trial of SHHC, intervention participants attended six months of twice-weekly exercise, nutrition, and heart health classes which included an individual, social, and environmental-level component.\textsuperscript{66} The intervention participants significantly reduced their weight over the course of the program. Participants in the study were from rural New York and many intervention participants saw improvements in physical activity score (41.5\%), healthy diet (37.3\%), and BMI (14.5\%).\textsuperscript{66} A refined version of the program called SHHC 2.0 saw significantly improved scores for Life Simple 7, a composite measure which includes obesity, hypertension, cholesterol, blood glucose, smoking, physical activity, and nutrition.\textsuperscript{67} Intervention participants also showed significant increases in both self-reported and objectively measured physical activity.\textsuperscript{67}

Play Streets is a program implemented within rural communities to promote childhood physical activity.\textsuperscript{68} It creates safe places for active play for families and children by implementing neighbor-led short road closures along with free opportunities for physical activity.\textsuperscript{68} Play Streets has been adopted in rural communities in Maryland, North Carolina, Oklahoma, and Texas. Researchers found that children attending three hours of a Play Streets event accrued an average of over 7,500 steps, which would account for over 50\% of the estimated steps required for children to meet moderate to vigorous physical activity recommendations of 60 minutes per day.\textsuperscript{68} Along with Play Streets increasing physical activity among children, it helped in addressing equity challenges surrounding access for families as Play Streets provided an easy, no-cost service.\textsuperscript{68}

The CDC’s High Obesity Program funds 15 land grant universities that work with their local communities to increase access to healthier foods and promote physical activity in rural counties where more than 40\% of adults are obese.\textsuperscript{69} During its first five years (2014–2018), the program increased healthy food access for more than 1.5 million people and expanded physical activity opportunities for nearly 1.6 million people.\textsuperscript{70} The CDC publishes a variety of success stories and promising practices from these grants that may be helpful in addressing obesity in rural communities.\textsuperscript{71}

**SUMMARY AND CONCLUSIONS**

Obesity and physical inactivity are risk factors for chronic disease throughout the U.S. However, rural adults are at a higher risk for both of these, with differences in obesity seen as early as three years old. Cultural norms and the built environment contribute to these disparities. However, in recent years several effective interventions have been developed that can improve the health of rural residents.
Dissemination and widespread adoption of these interventions, along with changes to the food and physical activity environments, are needed to eliminate rural/urban disparities in obesity and physical inactivity.

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Related Chapters:

Chapter 6. Nutrition and Healthy Eating in Rural America
Chapter 9. The Impact of Diabetes on Rural Americans
Chapter 18. Rural Health Issues in Child and Adolescent Development

Suggested Chapter Citation:

RURAL SUBSTANCE MISUSE TRENDS IN AMERICA

By Benjamin N. Montemayor, PhD; Gracie Woodland, BSPH; and Adam E. Barry, PhD

SCOPE OF THE PROBLEM

- Substance use and misuse continue to be significant public health concerns in the United States, with annual cost estimates of $192 billion and $151 billion for alcohol and drug use and misuse, respectively.

- Despite both urban and rural areas experiencing overall increases in the use of alcohol and drugs from previous years, rural communities are disproportionately impacted by the use of alcohol and drugs, including substance use disorders and alcohol- and drug-related mortalities, due to limited access to healthcare services and other resources in rural communities.

- Alcohol remains the most popular substance used across racial and ethnic groups and among all age groups in rural communities. Alcohol use tends to be greatest among those with peers and/or parents who consume alcohol, men, American Indian/Alaska Native people, and people with a mental health condition, especially if they are underage (<21 years old).

- As more Americans favor the legalization of cannabis and the use of cannabis, and those diagnosed with a cannabis use disorder continues to increase in rural areas, the landscape of cannabis in the U.S. makes its use a particularly important issue.

- Illicit drugs other than cannabis, primarily central nervous system depressants such as opioids and fentanyl, a synthetic opioid, present a significant concern in rural communities with fentanyl-related overdoses accounting for a majority of the overdoses in these areas.

- In addition to creating policies and community-level strategies that enhance prevention and treatment infrastructure in rural areas, assessing intrapersonal determinants of alcohol and drug use in rural communities could allow for tailored intervention and prevention strategies.
fifth of this population, reported using cannabis in the past year, a historically high prevalence (Figure 1).\textsuperscript{17} Similarly to alcohol, young adults aged 18-25 constituted the highest percentage of users (35%) followed by adolescents at 10.5%.\textsuperscript{5} Furthermore, studies contend that active users may have about a 10% likelihood of being dependent upon cannabis and about 3-in-10 active cannabis users may already use at levels indicative of a cannabis use disorder (CUD).\textsuperscript{18}

The use of illegal substances other than cannabis also remains prevalent in the U.S.\textsuperscript{17} The explicit and intentional use or misuse of opioids, such as heroin or prescription pain relievers, in the past year was reported among 3.3% of individuals aged 12 or older, most of whom (96%) misused prescription pain relievers such as oxycodone, hydrocodone, and fentanyl.\textsuperscript{5} Figure 1 shows a detailed breakdown of the most common illegal substances used among U.S. adults aged 12 and older. Furthermore, of the 46 million Americans who met the criteria of an SUD in the past year, nearly a quarter (23%) of those were aged 25 or younger.\textsuperscript{17} Implications for assessment of substance use beginning at a young age, ≤ age 12 in the case of most of the reported data in this chapter, allows for a comprehensive data representation of users and substances used, allows for comparative analysis, enables the informing of tailored prevention, intervention, and treatment planning and services, and supports evidence-based policy development and resource allocation.\textsuperscript{17}

Alcohol, cannabis, and other substance use rates vary by geographic region and classification (rural vs. urban), and are influenced by a wide array of individual (age, sex, socioeconomic status), interpersonal (peer pressure, familial drinking), and community-level factors (built environment, alcohol outlet density).\textsuperscript{19} The factors within these contributing levels of influence form complex, fluid systems that evolve and intersect with protective and risk factors over time.\textsuperscript{20,21}

**HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES**

The overarching goal of Healthy People 2030 is to set data-driven national health objectives, and to ultimately improve the health, well-being, and quality of life of Americans. Reducing substance use behaviors and the associated consequences among Americans remains a priority area. Among the nine general Drug and Alcohol Use objectives monitored by Healthy People, the vast majority (n=7) have had little to no discernable change or have gotten worse over the past decade.\textsuperscript{1} These nine general objectives include:

---

**Figure 1. Past-year Illicit Drug Use: Among People Aged 12 or Older; 2021**

![Figure 1: Past-year Illicit Drug Use](image)

- **Marijuana**: 52.5M
- **Rx Pain Reliever Misuse**: 8.7M
- **Hallucinogens**: 7.4M
- **Rx Tranquilizer or Sedative Misuse**: 4.9M
- **Cocaine**: 4.8M
- **Rx Stimulant Misuse**: 3.7M
- **Methamphetamine**: 2.5M
- **Inhalants**: 2.2M
- **Heroin**: 1.1M

*Rx = prescription.*

*Note: The estimated numbers of past year users of different illicit drugs are not mutually exclusive because people could have used more than one type of illicit drug in the past year.*

*Source:*\textsuperscript{17}
Herein, we will outline the scope of drug and alcohol use in rural America, highlighting the unique factors specifically contributing to substance use in rural areas of America and the need for comprehensive prevention, treatment, and harm reduction strategies. According to the U.S. Census Bureau, a rural area is defined as “any population, housing, or territory NOT in an urban area.” Areas with 50,000 or more people are considered Urban Areas (UA), while Urban Clusters (UC) are those areas with a population of at least 2,500, but less than 50,000 persons. Information presented in this chapter will:

1. Identify important personal (e.g., race/ethnicity) and environmental factors impacting substance use/misuse in rural areas and associated consequences.
2. Outline how the use/misuse of specific drugs differs in rural regions of the U.S., compared to urban areas.
3. Discuss drug and alcohol prevention and treatment in the rural U.S.

### UNDERSTANDING SUBSTANCE USE AND RELATED DISORDERS

In order to address the substance use behaviors of rural Americans, the definitions of various behaviors associated with substance use, and shifts in the modern terminology associated with substance use must be understood. Substance use, which does not necessarily equate to problematic use, nor use indicative of a disorder, is the consumption of psychoactive (affecting the mind) substances; this includes licit (legal) substances like alcohol and cannabis (in some states), or illicit (illegal) drugs such as the non-medical use of certain opioids, stimulants, hallucinogens, etc. Substitution misuse includes the intentional and non-medical or inappropriate use of legal or prescribed substances, or the use of illegal psychoactive drugs, which may lead to harm or other negative consequences. Until more recently, the term addict or dependence was commonly reserved for those who used substances at rates deemed problematic or at rates destructive or interruptive of personal and social health, relationship and responsibilities. More recently, the American Psychiatric Association encouraged a shift in terminology away from the use of harmful, stigmatized language that labels individuals (e.g., addict, substance abuser) and oversimplifies or prioritizes the behavior over the person, and toward terminology that places greater emphasis on describing problematic substance use, more notably, alcohol use disorder, cannabis use disorder, and substance use disorder. As the language evolves over time, and as professionals begin to understand more of the implications of different terminology on behavior, it is imperative that the correct language is used to minimize harm associated with these behaviors.

Alcohol, cannabis, and substance use disorders are all diagnosable conditions under the American Psychiatric Association which are

<table>
<thead>
<tr>
<th>Drug &amp; Alcohol Use Objectives1</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce the proportion of people who used heroin in the past year — SU-16</td>
<td>Target met or exceeded</td>
</tr>
<tr>
<td>Reduce the proportion of people who started using heroin in the past year — SU-17</td>
<td>Target met or exceeded</td>
</tr>
<tr>
<td>Reduce the proportion of people aged 21 years and over who engaged in binge drinking in the past month — SU-10</td>
<td>Little or no detectable change</td>
</tr>
<tr>
<td>Reduce the proportion of people who misused prescription drugs in the past year — SU-12</td>
<td>Little or no detectable change</td>
</tr>
<tr>
<td>Reduce cirrhosis deaths — SU-02</td>
<td>Getting worse</td>
</tr>
<tr>
<td>Reduce drug overdose deaths — SU-03</td>
<td>Getting worse</td>
</tr>
<tr>
<td>Reduce the proportion of adults who used drugs in the past month — SU-07</td>
<td>Getting worse</td>
</tr>
<tr>
<td>Reduce the proportion of adults who use marijuana daily or almost daily — SU-08</td>
<td>Getting worse</td>
</tr>
<tr>
<td>Reduce the proportion of motor vehicle crash deaths that involve a drunk driver — SU-11</td>
<td>Getting worse</td>
</tr>
</tbody>
</table>

Rural Substance Misuse Trends In America
primarily characterized by problematic substance use. Substance use disorder is a broad diagnostic term that has a wide-ranging severity and refers to the recurrent use of psychoactive substances that result in deleterious effects on bio-psycho-social health. Although SUDs encompass alcohol and cannabis use disorders, alcohol and cannabis impact the person and their environment in different ways and have their own clinical diagnoses. Alcohol and cannabis use disorders refers to the problematic consumption of alcohol or cannabis, respectively, leading to impairment or experiences of distress. Within each respective substance, symptoms include a lack of control of the use of the substance, unsuccessful efforts to cut down or control use, development of tolerance to the substance, cravings or withdrawal symptoms, neglect of major life responsibilities, and preoccupation with receiving and consuming more of the substance despite adverse consequences. It is worth noting that each specific substance entails a separate diagnosis and disorder (e.g., opioid use disorder, stimulant use disorder), but for the purposes of this chapter, we focused on the two major substances, and encompassed the rest as SUDs.

SUBSTANCE USE, DISPARITIES, AND CONTRIBUTING FACTORS IN RURAL AREAS

Alcohol

In the U.S., the likelihood of current drinkers exceeding daily suggested drinking limits and exhibiting AUDs are higher in rural areas, compared to suburban areas. There are many well-established factors contributing to the association between living in a rural community and experiencing alcohol-related harm and the prevalence of increased alcohol frequency and quantity. Specifically, being a man, being younger in age, having peers and/or parents who consume alcohol, and having a mental health condition are well-known risk factors associated with alcohol use, and continue to ring true for persons in rural communities. Accordingly, limited entertainment options, fewer alternative leisure activities, social norms surrounding the acceptance of heavy or high-risk alcohol use, and experiences of stressors unique to the rural community, such as challenges with agricultural or economic uncertainty, contribute to the inequitable ways in which rural communities engage in hazardous alcohol use and experience the related effects. For example, rural areas experience alcohol-related mortality and traffic fatalities at a disproportionately high rate. Having to drive longer distances in secluded areas, lack of public transportation, and scarce enforcement or monitoring of alcohol policy violations in remote regions can contribute to increased risk of alcohol-related accidents and traffic fatalities (e.g., fatal alcohol collisions). Some rural areas experience higher death rates from chronic misuse of alcohol, such as alcohol cirrhosis and other alcohol-related accidents and health complications. Barriers to seeking treatment, such as risk for loss of confidentiality, and fear of being stigmatized or judged by peers, coupled with limited treatment accessibility and availability may further hinder those with or at risk for AUD from getting the help they need.

Cannabis

Cannabis use in rural America has garnered increasing attention as the landscape of cannabis use continues to experience unprecedented shifts in policy. As these policy shifts favor medicinal and recreational legalization of cannabis use, fewer U.S. Americans perceive cannabis use as harmful and an overwhelming amount of U.S. older and younger adults favor the legalization of cannabis. Among hundreds of other elements found in cannabis plants (i.e., cannabinoids), the most commonly studied and highly used substances are cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC). THC, the primary psychoactive ingredient in cannabis, can range in potency and effects depending on the chemical alteration and the method in which it is ingested (e.g., smoked, wax, edibles). CBD is considered effective for medical use because of its potential therapeutic effects and trace amounts of THC, thus users experience some of the benefits without the “high” associated with THC. To date, only three states still prohibit CBD or cannabis use, while the remaining have mixed policies ranging from medical use only (CBD/Low THC) to recreational use allowed. According to the National Survey on Drug Use and Health, cannabis use patterns have revealed
significant increases in use over the past decade, including increases in both the frequency and intensity of cannabis use in rural communities. Additionally, research suggests individuals who live in rural communities may experience higher rates of cannabis use, CUDs, SUDs, and associated mental health disorders compared to their urban counterparts. Limited access to healthcare services and resources in rural communities may lead to individuals using cannabis as a way to self-medicate or alleviate symptoms of depression, anxiety, and chronic pain. Additionally, challenges related to misinformation or limited knowledge and education surrounding cannabis can contribute to overall misconceptions, stigma, and incomprehension regarding cannabis use benefits, responsible use methods, and associated consequences. For example, perceptions of harm regarding driving after consuming cannabis or THC among young adults is viewed as less dangerous than driving after consuming alcohol. Although information on this phenomenon is somewhat limited and continues to be evaluated, with disparities in cannabis use and associated mental health conditions growing, it is essential to address patterns of cannabis use in rural areas and understand the unique dynamics that continue to shape these behaviors.

**Illicit Drugs**

Illicit drugs refer to potentially highly addictive, and largely illegal, substances, though it is also important to note that many Americans use prescription drugs illegally (e.g., in ways not directed, or someone else’s prescription medication). Similar to alcohol and cannabis, factors contributing to illicit substance use in the U.S. include social and geographic isolation, unemployment due to economic downturns or limited employment opportunities, poorer health behaviors and outcomes, lower educational attainment, poverty, lack of access to mental health care or other comprehensive prevention and intervention programs, and a higher likelihood of risk-taking behaviors and labor-intensive work. As noted, societal and cultural elements, and stigma and negative reactions, often deter people from admitting to their drug use. For example, rural individuals are less likely to admit their drug use and misuse for fear of judgment and shame, thus contributing to underrepresentation in illicit drug use, not being properly diagnosed for a potential disorder, low treatment-seeking behavior, and further exacerbation of disparities in prevention and treatment services. Additionally, non-abstinence based medical and evidence-based methods to reduce harm and help those who suffer from a disorder are supported less often. Such ideologies were demonstrated in rural West Virginia, where a public outcry caused a needle exchange program to be shut down, further highlighting the lack of necessary support for many effective substance use interventions to function well in rural contexts.

While statistics often reveal that urban areas have higher rates of use, rural communities have more impacts due to drug-related illnesses. For example, more than 106,000 deaths occurred in 2021 due to drug overdoses nationwide, the vast majority of which stemmed from the misuse of prescribed opioids such as oxycodone, hydrocodone, and fentanyl. However, overdose rates in rural areas of the U.S. were 10% higher than in urban areas. Some evidence suggests prescription medications were disproportionality prescribed in rural versus urban communities without methods to sufficiently track or monitor the flow of medications into the community, contributing to a concerning pattern of missed or false diagnoses, overreliance on prescription medication, and potential misuse or SUD. When individuals in these communities are no longer able to afford the higher prices of prescription medications, some find themselves seeking non-prescription alternatives as a means of managing their potential disorder. Additionally, the availability and lethal potency of synthetic opioids, such as fentanyl, continue to contribute to an already concerning trend in illicit drug use and misuse. Of the over 100,000 drug overdose deaths in the U.S. last year, 67% involved synthetic opioids like fentanyl. With overdose deaths continuing to be a significant public health concern, efforts to address the overdose crisis remain at an all-time high.

**AGE, RACE/ETHNICITY, AND ENVIRONMENTAL INFLUENCES ON SUBSTANCE MISUSE IN RURAL AREAS**

**Adolescents and Young Adults - Alcohol**

Originally thought to be protective against exposure to substances, and the high rates of substance use observed in urban areas, rural
areas are experiencing their own influx of high-risk substance use.\textsuperscript{50} Across the U.S., underage drinking tends to be higher in most rural areas.\textsuperscript{11} For adolescents who started drinking before or during high school, the average age of first alcohol use falls between 14-16 years old.\textsuperscript{51,52} Risks of early initiation of alcohol use include higher likelihood of developing long-term alcohol-related problems, such as an AUD, delays in key cognitive developments, and more experiences of alcohol-related negative outcomes such as injuries or accidents and decreased academic performance.\textsuperscript{35} Adolescents in rural areas are more likely to report riding with a driver under the influence of alcohol (i.e., riding in a car with a driver who had been consuming alcohol).\textsuperscript{54} Overall, substance use among rural adolescents aged 12-17 is highest in small-medium rural areas (i.e., population of 2,500 to 19,999) and highest for young adults aged 18-25 in large rural regions (i.e., population of 20,000+ not adjacent to other urban or suburban areas.\textsuperscript{35} Compared to their rural White counterparts, Black students (aged 13-17) were less likely to report past-month alcohol use, such that 33% of 15-year old African American students drink in the past month compared to nearly half (48%) of White 15-year old students.\textsuperscript{56} Rural residence has been associated with higher AUD rates for underage Hispanic drinkers.\textsuperscript{16} Parental permissiveness (e.g., “parents don’t care if I drink”, “parents don’t care if I drink at home”) of alcohol use has been linked to greater alcohol consumption among rural adolescents, such that increasing parental permissiveness increased the likelihood of past-month alcohol use.\textsuperscript{56} Overall, past-year and past-month alcohol use prevalence among those over the age of 12 was 57.5% and 40.3% for rural areas respectively, slightly less than among those living in urban areas. The highest prevalence observed for both past-year (65.1%) and past-month (48%) alcohol use was among rural residents aged 18-25 years. Past-year and past-month underage drinking (ages 12-20) prevalence in rural areas was 29.8% and 15%, respectively, both higher than underage drinkers who reside in urban areas.\textsuperscript{5}

\textbf{Adolescents and Young Adults - Cannabis}

Nationwide, the legalization of cannabis use in some capacity (medicinal or recreational) has garnered significant support from the public. The majority of U.S. adults (59%) believe that cannabis should be legal for medical and recreational use, while 30% believe in legal use of cannabis for medicinal purposes only.\textsuperscript{9} Just one-in-ten adults believe complete prohibition of cannabis use is the right course of action.\textsuperscript{9} Among high school seniors, the majority (51.1%) of 12th grade students in the U.S. favored the legalization of cannabis use in 2021, the first time since the inception of the measurement that the majority of students supported legalization of cannabis use.\textsuperscript{57} Of particular concern is the average age of initiation for young adult cannabis users in the U.S., which falls between 15-18 years old.\textsuperscript{58} Research contends the earlier the onset of cannabis use among individuals, and the more frequent the use of cannabis, the higher the risk of developing a CUD in the future.\textsuperscript{39} With cannabis being the most commonly reported illicit drug used among users (86%), and with nearly a quarter of active cannabis users nationwide under the age of 25, it is important to understand the behaviors of those in rural communities.\textsuperscript{3} According to the National Survey on Drug Use and Health,\textsuperscript{60} past-year cannabis use was reported among 10% of adolescents ages 12-17 in urban areas, identical to the rates reported among those in rural communities.\textsuperscript{3} Young adults ages 18-25 years reported the highest rates of cannabis use of any population for rural residents. Nearly one-third (32.2%) of young adults in rural areas reported past-year cannabis use, slightly lower than their counterparts in urban communities (35.9%).\textsuperscript{5} Approximately 14% of rural-dwelling adults over the age of 26 years also participated in cannabis use. Despite cannabis use increasing in both urban and rural areas of the U.S.,\textsuperscript{61} the lack of resources and support, including limited access to healthcare or treatment facilities, leaves those in rural communities at a disadvantage.\textsuperscript{17} As noted earlier, cannabis use by adolescents and young adults is associated with impaired cognitive functioning and decreased academic performance; however, among rural areas in particular, there is often less overall education about cannabis, and cannabis use is associated with other risk-taking behaviors and potential mental health concerns.\textsuperscript{59} 

\textbf{Illicit drugs}

Other illicit drug use, not including cannabis, also poses a significant concern to various age groups.
throughout rural communities, necessitating attention and intervention. Although the motives for illicit drug misuse vary among individuals, a common trajectory of illicit drug users involves a transition from the use and misuse of prescription drugs to the use of more illicit non-prescription drugs like methamphetamines, hallucinogens, heroin, etc. Of those 12 years and older in rural areas, 13.3% and 3.7% have reported lifetime use of hallucinogens and crack, respectively. While this transition to illicit drug use might occur because these individuals prefer the effects of non-prescription drug use, oftentimes users find they are no longer able to afford the high prices of prescription medications and thus opt for the more affordable non-prescription options. The ingestion method of choice also increases the risks associated with illicit drug use. In addition to the mental health, drug overdose, and legal consequences related to drug use, intravenous injection of drugs can lead to the development of hepatitis B or C, as well as human immunodeficiency virus (HIV) due to needle sharing or unclean syringe use. Nonetheless, although drugs like methamphetamine and hallucinogens pose a threat to rural communities, the misuse of central nervous system depressants like opioids has emerged as a top health concern in rural areas. In 2021, almost one-third (29%) of individuals from rural communities reported any use of opioids and prescription pain relievers in the past year, 3% of which reported intentional misuse of these substances. As policies that restrict access to, and the prescription of, opiates for pain relief become enforced, those who are already using at levels indicative of a disorder might turn to other illicit substances to alleviate disorder symptoms. This is especially problematic in rural areas with low access to comprehensive prevention, education, and treatment or support.

Differences between Sex, and Race and Ethnicity

Across the U.S., 63.8% of men aged 12 and older used alcohol in the past year, slightly higher than their women counterparts at 60.9%. Although more underage drinkers tend to be women over men (30.7% vs. 26.4%), men who are of legal drinking age (70%) have a higher prevalence of alcohol use relative to women of legal drinking age (65%). Overall, men are more likely to report higher rates of binge drinking and heavy use drinking, compared to similarly aged women. Generally speaking, the previous trends hold true in rural areas. Nationwide cannabis use patterns tend to also align with the sex-based trends observed in alcohol consumption. More men aged 12 and older engaged in cannabis use in the past year than women (20.8% vs. 16.7%), and this trend held constant among the 12-17, 18-25, and 26 and older age groups. Cannabis patterns observed in both rural and urban settings independently tend to align with the national trends mentioned. Finally, sex demographic differences are also observed among illicit drugs other than cannabis among those aged 12 and older. Across all illicit substances, men tended to use more than women on categories besides opioids until age 24, at which point slightly more women used opioids.

Research has shown variables such as social and cultural factors or traditions, economic challenges, health disparities, coping mechanisms due to low availability of resources, and historical context (e.g., communities with a history of oppression or marginalization) may at some point play a major role in the use of alcohol and illicit drugs among racial and ethnic minorities in rural areas and health inequities at large. The following racial and ethnic nationwide trends tend to hold true in rural areas. White individuals report the highest levels of current alcohol consumption, while individuals of American Indian/Alaska Native heritage report the highest rates of alcohol misuse and dependence. Additionally, individuals of American Indian/Alaska Native heritage are most vulnerable to experiencing alcohol-related consequences. Compared to their heterosexual peers, sexual minority youth continue to demonstrate higher prevalence of alcohol use behaviors. National data revealed individuals of American Indian/Alaska Native heritage aged 12 and older had the highest prevalence of cannabis use, followed by the next highest among those who reported being bi-racial, and then Black or African American. Additionally, individuals of American Indian/Alaska Native heritage had higher lifetime hallucinogen use, crack and cocaine use, and opioid use, though the gap in use for opioids within ethnic and racial demographics were relatively close among all besides those who
reported being of Asian origin or race. Overall, compared to their heterosexual peers, sexual minority individuals continue to demonstrate higher prevalence of cannabis use and an increased risk for overall illicit drug use.\textsuperscript{58}

\textbf{Other Environmental Factors}

Beyond the aforementioned factors that contribute to the use of substances in rural communities (i.e., limited entertainment options and recreational opportunities, social norms and influence, economic challenges, and lack of healthcare resources), neighborhood characteristics, including alcohol outlet density, economic conditions/circumstances, and property crime, have been linked to increased binge drinking behaviors.\textsuperscript{69-71} Among Black Americans, experiences of racial discrimination are associated with alcohol consumption, binge drinking, and negative alcohol-related consequences.\textsuperscript{7,72-74} In an exploration of substance use among rural adolescents, engagement in violent and aggressive behavior, as well as having delinquent friends, were associated with increased likelihood of using alcohol, tobacco and cannabis.\textsuperscript{54,56,61} Furthermore, cannabis and other illicit drugs may be more readily available in some areas due to the reduced presence of law enforcement and monitoring of illicit drug activities, and overall closer proximity to cultivation locations.\textsuperscript{75} Additionally, individuals who have experienced adverse childhood events (ACE) (e.g., witnessing or experiencing violence, physical or emotional abuse, or neglect in the home or community) are also more likely to participate in substance use.\textsuperscript{76} Individuals living in rural areas, especially ethnic and racial minorities, may experience challenges unique to their communities and higher rates of ACEs compared to their urban counterparts.\textsuperscript{77} Perceived social support from family members has been identified as a strong protective factor against substance use among rural adolescents.\textsuperscript{78}

\textbf{SUBSTANCE USE TREATMENT AND PREVENTION BARRIERS IN RURAL AREAS}

Overall, the need for, and availability of treatment services differ in rural communities/areas. There are few alcohol and drug treatment facilities operating outside of urban and rural adjacent areas. Treatment facilities in rural regions are less likely to provide comprehensive services that are crucial to successful outcomes such as detoxification, mental health services, or having counselors who are readily accepted by minority populations, women, or HIV-positive individuals.\textsuperscript{70} Urban areas tend to have more specialized professionals, with more education, than the staff that work in rural treatment facilities.\textsuperscript{80} Moreover, intensive services are less frequently offered within rural facilities.\textsuperscript{81} Consequently, Lambert & Gale (2008) have recommended “Rural community infrastructure should be enhanced to support abuse prevention and intervention.”\textsuperscript{55(p221)}

Computerized interventions have been highlighted as potential cost-effective options for rural and sparsely populated areas that may help address the lack of robust treatment options available to persons in rural communities.\textsuperscript{81} Telehealth or teletreatment options for SUDs have emerged as treatment options that span geographical divides, can occur in a person’s home, and increase privacy for those receiving treatment.\textsuperscript{82} It should be noted, however, that telehealth or teletreatment represent one component of what, ideally, should be a coordinated and comprehensive approach, inclusive of approaches such as screening, brief intervention and referral, personal counseling, and/or group therapy. Screening for substance use behaviors and referrals to counseling interventions have demonstrated positive effects and outcomes. Moreover, there is no evidence indicating screening instruments and counseling interventions are associated with unintended harmful effects.\textsuperscript{83,84} Given the strong connection between alcohol, drug use, and mental health, coupled with the geographic disparities associated with living in a rural area, such as significantly less access to primary care,\textsuperscript{8} efforts to increase physical and/or digital infrastructure represent important public health initiatives. Finally, treatment centers or clinics can come at a cost, and public transportation to clinics is scarce in rural areas. These realities inhibit access to, and affordability of, treatment services.\textsuperscript{79} In a low socioeconomic area, like the many rural areas facing growing poverty levels, expensive drug treatment might not seem essential to users.
SUMMARY AND CONCLUSION

If prevention and treatment options are going to target individual substances, it is recommended that prevention efforts prioritize alcohol use. First, alcohol is the most commonly used substance among American school-aged youth. Second, alcohol has been identified as the initial substance adolescents try, and its use is tied to subsequent illicit substance use later in life. Moreover, alcohol use is linked to poorer academic performance and engagement in other risky behaviors, both of which could negatively impact future work and educational opportunities.

An approach preferred to specific substance-focused interventions would be policies and strategies enhancing prevention and treatment infrastructure. Currently, “the narrow range of services available in rural areas may preclude an individualized treatment approach and long-term follow-up.” Thus, environmental approaches that account for the unique rural geographic, economic, and social forces should be developed. Given school is required of all American youth between six and 19 years of age, the primary school setting represents an ideal environment in which to ground these efforts. That said, the Center for Disease Control and Prevention’s Whole School, Whole Community, Whole Child approach asserts a student-centered approach emphasizing alignment and integration across ten different components (e.g., health education, physical environment, counseling, community and family involvement) and represents best practice in this environment.

Future research and prevention efforts exploring differences in alcohol and other substance use across geographic regions would be improved by employing standardized definitions for these areas, as well as more nuance across the continuum of rural to urban classifications, as opposed to a dichotomous rural vs. urban approach. Nevertheless, as this chapter has made clear, rural areas represent unique contexts that are consistently linked to the substance use behaviors of their residents. For instance, a systematic review exploring international research including 280 studies across 49 countries, found “rural, relative to urban, residence to be associated with an increased likelihood of hazardous alcohol use or alcohol-related harm.” The authors further stated “improved public health strategies to reduce the burden of alcohol use in rural communities are required, but their efficacy will depend on how well they are tailored to the unique needs of the region they are implemented in.” Consequently, in-depth needs assessments that assess important individual, community, and familial-level factors are recommended. These include, but are not limited to levels of religiosity, social norms surrounding alcohol and other substance use, as well as family relationships and community ties. Once assessed, these factors can then be leveraged in the conceptualization and implementation of targeted intervention and prevention strategies.

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Related Chapters:
Chapter 1. Mental Health and Mental Disorders: A Rural Challenge
Chapter 2. Addiction in Rural America
Chapter 3. Rural Healthcare Access and Quality
Chapter 20. The Issue of Chronic Pain in Rural America

Suggested Chapter Citation:
Across the lifespan, people who eat less healthfully are at higher risk for health problems such as obesity, type 2 diabetes, and cardiovascular disease. Healthy eating can help prevent these problems, as well as help manage them. Healthy eating patterns include consumption of vegetables, fruits, whole grains, dairy or alternatives, and lean proteins, and limiting foods and beverages with added sugars, saturated fats, and sodium. Generally, most Americans do not eat according to the recommendations provided in the Dietary Guidelines for Americans. Food insecurity among adults is associated with unhealthier eating patterns, cardiovascular disease (e.g., hypertension, high cholesterol), mental health issues (e.g., depression), poor quality sleep, and overall worse health outcomes. Food insecurity among children is associated with lower nutrient intake, cognitive problems, behavioral problems (e.g., aggression), mental health issues (e.g., depression, anxiety), asthma, and being in poorer overall health. People in rural areas are more likely to have lower diet quality, higher food insecurity, and chronic, diet-related conditions such as hypertension and obesity.

HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

The United States Department of Health and Human Services established the Healthy People initiative 30 years ago to provide a roadmap for Americans to improve their health and wellbeing. The current iteration of the program, Healthy People 2030, contains more than 25 objectives related to nutrition and healthy eating. The following Healthy People 2030 objectives will be discussed in this chapter, particularly as they pertain to rural Americans.

a. Increase consumption of healthy foods
NWS-06: Increase fruit consumption by people aged 2 years and over
NWS-07: Increase vegetable consumption by people aged 2 and over
NWS-08: Increase consumption of dark green vegetables, red and orange vegetables, and beans and peas by people aged 2 years and over
NWS-09: Increase whole grain consumption by people aged 2 years and over
b. Reduce consumption of unhealthy nutrients
   NWS-10: Reduce consumption of added sugars by people aged 2 years and over\textsuperscript{11}

c. Improve food security, increase the proportion of students participating in nutrition programs, and increase the proportion of schools that promote healthy eating
   NWS-01: Reduce household food insecurity and hunger\textsuperscript{11}
   NWS-02: Eliminate very low food insecurity and hunger\textsuperscript{11}
   AH-04: Increase the proportion of students participating in the School Breakfast Program\textsuperscript{11}
   AH-R03: Increase the proportion of eligible students participating in the Summer Food Service Program\textsuperscript{11}
   ECBP-D02: Increase the proportion of schools that don’t sell less healthy foods and drinks\textsuperscript{11}

d. Reduce high blood pressure and obesity
   HDS-04: Reduce the proportion of adults with high blood pressure\textsuperscript{11}
   NWS-03: Reduce the proportion of adults with obesity\textsuperscript{11}

RHP 2030 SURVEY OUTCOMES

Nearly 1,300 rural stakeholders responded to a web-based Rural Healthy People 2030 survey to determine the most important health priorities for rural Americans.\textsuperscript{12} Respondents, including government officials, healthcare providers, academicians, and community leaders selected the top 10 priorities for rural Americans from 62 Healthy People 2030 leading health indicators. Overall, 38.3% of respondents identified nutrition and healthy eating as a top 10 priority for rural Americans, creating an overall ranking of sixth most important priority. Fourteen percent of respondents selected nutrition and healthy eating as the first, second, or third health priority for rural Americans, creating an overall ranking of sixth most important priority. Rankings did not vary significantly between census regions or gender. Respondents over age 65 years ranked nutrition and healthy eating as the 10th highest priority. Non-White respondents ranked nutrition and healthy eating third, whereas White respondents ranked it sixth.

PREVALENCE AND DISPARITIES IN RURAL AREAS

Note: The terms ‘metropolitan,’ ‘non-metropolitan,’ ‘urban,’ and ‘rural’ are used across different studies with slightly different definitions. To maintain integrity and accuracy, we have retained the terms used in the original research when referring to specific studies. When specific studies are not referenced, we use the terms ‘urban’ and ‘rural.’

Eating Patterns

Rural-dwelling adults face a host of barriers that influence food choices and contribute to less healthy eating patterns and negative health outcomes, when compared to their urban-dwelling counterparts.\textsuperscript{13} For example, residents in rural areas tend to consume fruits and vegetables less frequently than those in urban areas,\textsuperscript{1} and rural adults are less likely to consume five or more daily servings of fruits and vegetables.\textsuperscript{2} Furthermore, rural adults are more likely to consume sugar-sweetened beverages than urban adults.\textsuperscript{3} Older cancer survivors living in isolated small towns had roughly one-half the vegetable and fruit consumption of those living in other rural and urban areas.\textsuperscript{14}

For children from low-socioeconomic, rural, and population groups historically considered minority, the home food environment is a substantial predictor of food choices, consumption of fruit and vegetables, and overall dietary intake patterns.\textsuperscript{15} In particular, food availability in the home plays a significant role in children’s dietary intake.\textsuperscript{16} The rural versus urban disparities in dietary intake among adults are also noted among youth: among 12- to 19-year-olds, rural children were less likely to consume any fruit or meet the recommendation of two cups of fruit a day.\textsuperscript{17} A four-county study in rural Colorado found that parent reports of child dietary intake indicated 2- to 5-year-old children did not meet USDA dietary recommendations for adequate daily consumption of vegetables (0.7 cups consumed/1.5 cups recommended), whole grains (0.7 oz consumed/2.5 oz recommended), protein (2.3 oz consumed/4 oz recommended) and dairy (2.2 cups consumed/2.5 cups recommended).\textsuperscript{18} Eittenne-Gittens et al. found that urban children
were offered and consumed a greater variety of vegetables compared to their rural counterparts. Some research has demonstrated mixed findings, however; for example, one study demonstrated that relative to rural adolescents, suburban adolescents had a significantly higher intake of sugar-sweetened beverages, sugary food, and fruit/vegetable intake.

**Food Insecurity and Nutrition Programs**

Poverty is directly related to the ability to obtain healthy and affordable foods, which is linked to food insecurity. In 2020, in metropolitan areas, the poverty rate was 11.0%, while in nonmetropolitan areas the poverty rate was 14.0%, which was notably higher than urban areas. According to the 2022 USDA Household Food Security report, 10.8% of rural households were food insecure in 2021, compared with 10.1% of urban households. In the U.S., nearly 90% of high food-insecure counties are rural.

For children in 2019 21.1% of nonmetropolitan children in the U.S. were poor, compared to 16.1% of metropolitan children. From 2015-2019, at the county level, there were 138 counties in the U.S. with child poverty rates of 40% or higher, and only 11 of them were metropolitan counties. The remaining 127 were nonmetropolitan counties, primarily in the South (84.3%) with concentrations in Mississippi, Georgia, Kentucky, and Texas – where child poverty rates have been persistently high, particularly among the Black population.

Food and nutrition assistance programs for Americans with a low income exist to address food security and improve diet quality, including the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Additionally, the USDA's child nutrition programs (the National School Lunch Program, School Breakfast Program, Child and Adult Care Food Program, Summer Food Service Program, and After-School Snacks and Meals) play a significant role in children's food security, diets, and overall well-being.

**Related Health Conditions**

According to data from the 2013 nationwide Behavioral Risk Factor Surveillance System (BRFSS) of over 440,000 adults in the U.S., those living in nonmetropolitan counties were more likely to report chronic diseases associated with unhealthy eating practices and associated risk factors compared to those living in metropolitan counties. In the most rural areas, the self-reported unadjusted prevalence of hypertension was 40%, compared to 29% in the most urban areas. There is a higher prevalence of obesity in nonmetropolitan versus metropolitan counties and this is particularly acute in the South and Northeast. Among youth, there was significantly more obesity among rural compared to urban individuals (21.8% vs 16.9%, respectively). A meta-analysis of over 74,000 pooled participants ages two- to 19-years old reported that rural youth had 26% greater odds of obesity, compared to urban children (odds ratio=1.26; 95% confidence interval, 1.21–1.32). Related, food insecurity is negatively associated with health in a variety of populations.

**VARIATION BY RURAL REGION**

**Eating Patterns**

Little data exist about eating patterns by region, but some state level data contribute to understanding differences in dietary intake. Fruit and vegetable intake patterns from BRFSS indicate state-level variation for vegetables, but not for fruit, with median daily intake at 1.0 cups for fruit and 1.6 cups for vegetables. All states reported median daily intake frequencies of 1.0 cups for fruit. For vegetables, median daily intake ranged from 1.5 to 1.9 cups. Louisiana, Mississippi, Nevada, and New Mexico report the lowest median daily intake of vegetables. Three of these four states, Louisiana, Mississippi, and New Mexico, have more than 15% of their population residing in rural areas.

**Food Insecurity**

Poverty and food security are intrinsically linked; households in poverty often lack the resources to access sufficient nutritious food. While the overall rate of poverty is higher in rural versus urban areas, the difference between rural and urban poverty rates varies significantly across U.S. census regions. Food insecurity rates are higher than the national average (10.2%) in many southern
states: Kentucky (12.3%), South Carolina (12.6%), Alabama (13.1%), Texas (13.7%), Oklahoma (13.8%), West Virginia (14.0%), Louisiana (14.5%), Arkansas (15.0%), and Mississippi (15.3%); the South census region has higher than national average percentages of the population living in rural areas. There are marked regional disparities, with eight out of 10 high food insecure counties in the South and nine out of 10 high food insecurity counties nationwide disproportionately rural. The COVID-19 pandemic also exacerbated the food insecurity already prevalent in the southern regions with southern and mid-southern regions reporting higher food insecurity rates compared to the U.S. average.

**Related Health Conditions**

According to 2017 BRFSS data, hypertension prevalence is consistently higher in the Southeastern region, Appalachian counties, and among non-Hispanic Blacks. County-level prevalence of hypertension ranged from 18.0% to 55.0%. From BRFSS 2016 data, the prevalence of obesity-associated chronic diseases was significantly higher among adults living in nonmetropolitan counties in the South census region compared to adults living in metropolitan counties in the same census region. This finding is partly attributed to the high rate of persistent poverty and lack of access to healthier food retailers (supermarkets, large grocery stores, and fruit/vegetable specialty stores) in rural areas of the South region.

**Variation by Race and Ethnicity**

**Eating Patterns**

In a cluster analysis of African American women in the rural southern U.S., two dietary patterns were identified. One dietary pattern was characterized by a higher frequency of intake for cereals, fast/fried foods, and desserts, and the other dietary pattern was characterized by higher frequency of salad, water, whole grains, added sugars, and alcohol intake. However, as a whole, the study participants did not tend to consume recommended amounts of fruits and vegetables and consumed more than the recommended amount for added sugars. A healthier cluster was identified which consumed fruits, vegetables, and nuts, but study participants in this healthier cluster still ate higher than recommended amounts of salt and added sugar. In Texas, rural Hispanic children had lower diet quality (as measured using a modified Healthy Eating Index) than non-Hispanic children. A study of Native American caregivers and their children found that caregivers who were in rural, food insecure households ate less vegetables, and consumed more fruit juice, sugar-sweetened beverages, and fried potatoes than their rural, food secure counterparts.

**Food Insecurity**

Food insecurity is also more pronounced among non-White racial/ethnic groups compared to their White counterparts. Data from 2020 indicate that Black rural residents were 2.5 times more at risk of hunger than their White counterparts residing in rural areas. Furthermore, American Indians and Alaska Natives living in rural communities experience extremely high rates of food insecurity when compared with other racial and ethnic groups. Using data from the Current Population Survey Food Security Supplement, it was found that 25% of American Indian/Alaska Natives were consistently food insecure and were twice as likely to be food insecure as their White counterparts. In contrast to other studies, one study of American Indians found that food insecurity was significantly higher in urban versus rural American Indian households.

**Related Health Conditions**

From 1999 to 2018, annual age-adjusted mortality rates were substantially higher for Black adults compared with White adults for diabetes in rural areas versus the national average (average mortality rate 1999 to 2018: 76.2 vs. 37.2 deaths per 100,000; p < 0.001); hypertension (31.3 vs. 10.9; p < 0.001); heart disease (425.0 vs. 331.7; p < 0.001); and stroke (112.6 vs. 73.9; p < 0.001). Thus, mortality rates of diabetes, hypertension, heart disease, and stroke are highest among Black adults in rural parts of the U.S., when compared to White adults in rural areas. Although not rural-specific, data from 2018 indicates that American Indians/Alaska Natives also have higher rates of coronary heart disease than non-Hispanic Whites (8.6% for American Indians/Alaska Natives vs. 5.8% for non-Hispanic
Healthy eating can help prevent, as well as help manage, conditions such as diabetes and cardiovascular disease.\(^8\)

**IMPACT ON MORTALITY, MORBIDITY, AND OTHER HEALTH PROBLEMS**

Because residents of rural areas tend to eat less healthfully and have higher levels of obesity and hypertension, they are at higher risk for associated health problems, such as diabetes, cardiovascular disease, and certain cancers.\(^33\) In one study, diabetes and coronary heart disease prevalence were 8.6% and 38.8% higher among rural residents compared with urban residents, respectively.\(^35\) While diabetes mortality continues to decline in urban areas, diabetes mortality in the rural South has remained stagnant.\(^36\) Less healthful dietary patterns and limited access to healthy food likely contribute to these health disparities, as one study found that a higher density of low-quality food stores was associated with a 34% higher incidence of type 2 diabetes.\(^37\)

**BARRIERS**

*Poverty and Financial Strain*

Poverty and financial strain make it difficult for rural residents with a low income to consume a healthy diet that aligns with Healthy People 2030 goals.\(^38\) Poverty and financial struggle in rural areas are driven by higher unemployment rates, which were exacerbated by COVID-19, when compared to urban areas.\(^39\) One study found that rural unemployment and underemployment made it difficult for families to afford food.\(^39\) The consequences of higher poverty rates in rural versus urban areas are detected in individual residents’ lives as they face greater difficulty in obtaining a healthy diet. For example, a qualitative analysis of longitudinal in-depth interviews with rural adults found individuals cost burdened with many struggling to pay rent and buy food, constantly redirecting financial resources from one part of their budget to pay for another.\(^40\) Similarly, a qualitative study interviewing SNAP recipients in different rural regions found that the majority of individuals felt as though their SNAP monthly benefit was not enough to feed their families.\(^41\) Moreover, rural residents are vulnerable to deepened poverty and food insecurity when natural disasters occur and job opportunities change that are connected to natural resources.\(^42,43\)

*Access to Healthy Food*

The difficulty in accessing high quality, healthy, and fresh foods exacerbates stressors on rural families. Food access is impacted by a lack of reliable transportation, or public transportation, in rural communities. Qualitative data from rural residents in Mississippi revealed that the time constraints faced due to significant travel time to procure healthy foods were also barriers to healthy eating.\(^41\) In a study of food insecure rural residents, participants described how employment opportunities, community resources, and food retail establishments were far away from their homes, making it difficult to make money and obtain healthy and affordable food.\(^41\) Furthermore, participants reported that the location and hours of operation of meal sites for the Summer Food Service Program were important to program access, as transportation was a major barrier to summer meal participation.\(^41\)

Lack of access to healthier food retailers (supermarkets, large grocery stores, and fruit/vegetable specialty stores) in rural areas is an environmental barrier that contributes to limited food choices, adverse eating patterns, and food insecurity. In 2015, 6% to 18% of the U.S. population had limited access to a supermarket or grocery store, based on proximity measures of 0.5 to one mile for urban and 10 to 20 miles in rural areas.\(^45\)

In many rural areas of the U.S., counties with a higher percentage of White residents had better access to food than other counties.\(^16\) In rural American Indian/Alaska Native communities, limited access to food was more than three times as high as rural counties with a majority of non-Hispanic White residents (29.8% versus 9.0%).\(^46\) Another study found that stores serving rural residents in Maryland were more likely to offer less healthy food than healthy food options.\(^47\) Being located in proximity to healthy food sources is a key component of healthy food intake. Among rural participants, lower perceptions of the availability of affordable healthy food in one’s neighborhood are
associated with a lower likelihood of meeting fruit recommendations.\textsuperscript{48}

Because rural areas often have access to small “corner” stores as opposed to supermarkets,\textsuperscript{49} many studies have included the implementation of healthy small store interventions to improve healthy food access in rural areas. Unfortunately, some small store owners do not think that products such as fresh fruits and vegetables, whole grains, and other healthy products will sell well in their stores.\textsuperscript{41,50} While some small store owners are concerned about their ability to stock and promote healthy foods to customers, customers are generally supportive of efforts to add healthier foods to small stores.\textsuperscript{51}

**Limited Healthy Food Availability**

Taber et al. found that there were fewer healthy food retail policies in rural versus urban areas of the U.S., and healthy retail policies were positively associated with income in rural areas.\textsuperscript{52} A study in rural central Appalachian counties reported that higher food costs in the region, when compared to other non-Appalachian regions, were predictive of food insecurity and greatly influenced the consumption of fruits and vegetables.\textsuperscript{53} In Montana, fruits and vegetables in rural grocery stores were lower in quality than those in urban areas.\textsuperscript{40} Such findings provide evidence of low healthy food availability in rural areas, which further drives less healthful dietary behaviors.

**KNOWN CAUSES OF THE PROBLEM**

The noted disparities in healthy dietary behaviors and subsequent diet-related disease risk are multi-faceted and related to many of the reviewed barriers. The heterogeneity of rural areas in the U.S. makes it challenging to pinpoint exact targets for intervention and area-specific knowledge is often needed. However, there are certain known causes of an unhealthy diet and diet-related diseases that cross most rural boundaries. For example, those living in rural areas who are also facing financial hardships likely find it difficult to obtain healthy, affordable foods.\textsuperscript{40} Furthermore, limited access to healthy foods is a known cause of an unhealthy diet, and rural residents are more likely to live farther from healthy food venues.\textsuperscript{54-57} In a study among rural African American adults in Alabama, access to healthy foods was noted as a challenge when attempting to eat healthfully.\textsuperscript{58} Furthermore, the cultural beliefs and practices of rural versus urban residents are often different, leading to misperceptions about body weight and risk, as well as about health risks associated with unhealthy dietary behaviors and unhealthy body weight.\textsuperscript{59-61} Financial issues, lack of access to healthy food venues, and cultural beliefs are not insurmountable causes of disparities in rural areas, and several promising strategies are discussed in the following section.

**SOLUTIONS AND INTERVENTIONS**

Healthy eating depends on multiple personal, social, setting, behavioral, and policy level factors that may prevent or motivate behaviors. Public health responses to support the intake of healthy foods have been developed, such as individual-level nutrition education and/or changes in policies, systems, and environments. While there are many barriers to healthy eating in the rural U.S., there are also many rural assets such as seasonal produce stands, fishing, foraging, and strong social ties through churches or other social groups, which can be utilized to promote healthier eating in rural populations.\textsuperscript{64} Thus, solutions and interventions for healthy eating in rural areas require a multi-pronged approach shaped by overlapping and dynamic influences.

**Increase Access**

- Increasing access to healthy foods is essential since many rural communities are challenged by a lack of retail food options, inadequate stocking of healthy foods, affordability, and transportation barriers. Multiple nutrition interventions have been conducted in rural geographies and found success in improving food access through incentives (e.g., coupons) for healthy food, food boxes, awareness about healthy food, educational displays in food retail, recipes and taste tests, healthy food marketing, and in-store training.\textsuperscript{62,63} Additionally, the U.S. Department of Agriculture’s Gus Schumacher Nutrition Incentive Program funds nutrition incentive and produce prescription projects nationwide, including in rural spaces, that provide consumers with a low income with financial incentives.
for fruits and vegetables. This mechanism has demonstrated increases in fruit and vegetable intake and food security across participating populations, as well as positive economic impacts for food retailers.64

- Innovations such as California’s “Produce on the Go,” a mobile fruit and vegetable market, combined with a social marketing campaign, should be tested for effectiveness in additional rural areas of the U.S.65 Rural areas in particular may be ideal for healthy corner store interventions as there may be increased opportunities for partnerships with farmers to supply local produce, and because such stores may be increasingly used by rural residents due to long distances to more traditional food stores, such as supermarkets.66-68

- In rural Indigenous communities, food retail interventions to improve food and beverage environments have been effective.69

Food Labeling

- In rural settings, a substantial percentage of food shopping occurs at mass merchandisers (e.g., Walmart) and discount stores.70 In these spaces where packaged food is prevalent, consumers can use a food label to make decisions about the nutritional components of the food. Interventions that offer choice experiments in food label placement (e.g., putting nutrition labels on the front of food packages) and nutrition facts panel tailoring (e.g., color coding to indicate healthfulness) both have the potential to shape healthy food selection. Gustafson and Prate (2019) tested the impact of tailoring healthy food labels for a rural American Indian population and found that although generic labeling drove healthy food selection, tailored labeling toward the community was more effective.71

Other Relevant Considerations

Several additional working solutions and innovations related to improving nutrition in rural communities are noted in the following list.

- Community-wide approaches to supporting nutrition in rural spaces are warranted. In Kentucky, a community-driven multi-year intervention focused on food retailer and physical activity space improvements resulted in increased fruit and vegetable intake.13

- Because summer months are particularly difficult for food insecure families, and because rural households have difficulty accessing the Summer Food Service Program, the Meals-to-You program was pilot tested in rural Alaska, New Mexico, and Texas.72 Those participating in Meals-To-You and Emergency Meals-To-You had larger declines in food insecurity, especially in more remote and rural areas of the U.S.72 This suggests that future studies should include improvements to increase the accessibility of federal nutrition assistance programs particularly in rural and remote areas.

- A lack of healthcare access in rural versus urban areas has led to telehealth solutions for obesity treatment, as well as management and prevention of chronic disease.73-76

- Text messaging and other mobile health interventions have the potential to reach residents in rural areas and increase information about healthy eating.77

- Predominantly rural states could consider the adoption of statewide policy, systems, and environmental interventions to increase access to fresh fruits and vegetables as has been done in West Virginia and many school districts.78-79

- “Food as Medicine” programs, such as the U.S. Department of Agriculture’s Gus Schumacher Nutrition Incentive Program - Produce Prescription Program, expand access to healthy foods by providing free or subsidized fruit and vegetable prescriptions, home-delivered meals, medically tailored meals, or food baskets to participating individuals.80,81
School-based interventions in rural areas have been effective in reaching youth to encourage healthy eating.

Strategies to modify foods available at home are recommended to improve the quality of dietary intake for young children. This is of more significance for families with socioeconomic and racial/ethnic diversity at risk for health disparities.

Other solutions lie outside of food interventions. For example, the solutions to healthy eating for food insecure populations intersect with poverty. In a national study of 153 rural individuals who serve as the primary grocery shopper for their household and face food insecurity, it was found that barriers in affordability, availability, and preferences were difficult to overcome despite shoppers’ desire to provide healthy meals to their families. These individuals coped by coordinating multiple resources for food (e.g., federal food assistance, free meal programs, donations from friends and family), implementing food resource management skills, consuming lower quality foods, rationing food, and taking desperate actions (e.g., skipping meals, watering down food and drink). Further economic intervention to reduce barriers for food insecure populations in rural spaces is warranted.

Rural residents have higher transportation-related costs related to accessing healthy food than do urban residents, and thus, transportation innovations (e.g., drone delivery and mobile markets) should be tested in rural areas, ultimately to improve access to healthy foods in rural and remote areas.

For American Indian/Alaska Native communities residing in rural areas, community-based participatory interventions that draw upon cultural values and food ways (e.g., customs of food production, preparation, preservation and presentation), as well as environmental supports have shown effectiveness in improving healthy eating.

Interventions exist for rural areas that pair active living with healthy eating. For example, multilevel approaches such as the Strong Hearts, Healthy Communities intervention and the Eat Healthy, Be Active community workshops led by promotoras (Hispanic/Latino community health workers) address diet, physical activity, and other needs in rural areas.

SUMMARY AND CONCLUSIONS

Rural populations continue to face significant barriers and challenges to healthy eating. Rural adults and youth eat fewer fruits and vegetables and consume more sugar-sweetened beverages than urban adults and youth; they also are more likely to report chronic diseases and associated risk factors. Food insecurity rates continue to be higher in rural compared to urban areas. Food insecurity is related to chronic physical and mental health issues, and health costs are higher for people with nutrition-related health problems. Eating patterns, food insecurity, and related health conditions vary by rural region, race, and ethnicity. Food insecurity rates are higher in the South and among Black and Native American residents; obesity-associated chronic disease rates are higher in the South and Southeastern U.S., as well as among Blacks. Healthy People 2030 nutrition and healthy eating goals and objectives include increasing the consumption of healthy foods, reducing consumption of unhealthy nutrients, improving micronutrient consumption, improving food security, and reducing high blood pressure and obesity.

Barriers to healthy eating include poverty and financial strain, lack of access to healthy food, and limited healthy food availability. Longer travel times in rural areas and lack of reliable transportation or public transportation affect access to healthy food retailers, as well as to Summer Food Service Program meal sites for youth. Fruits and vegetables in rural areas may be of lower quality. Higher food costs in rural areas contribute to the unaffordability of healthy foods. Rural areas are less likely to implement healthy food retail policies, and corner store owners are hesitant to stock products such as fresh fruits and vegetables and whole grains.
Successful interventions that focus on increasing access to healthy foods in rural areas have included incentives, produce prescription projects, mobile fruit and vegetable markets, and increased access to summer meals. Increasing awareness about healthy food, in-store training, tailored food labels, community-wide approaches, telehealth and mobile health interventions, school-based programs, and transportation innovations (e.g., drone delivery) have also been effective in rural areas. Measurement, including the definition of rural itself, needs more research and attention. Although some tools do exist, measurement related to food access and insecurity also needs more rural-tailored tools. GIS and other technologies should be employed both from surveillance and intervention/need perspective. Common assumptions related to the relationship between nutrition, obesity, health, and mortality may have to be reconsidered in certain populations, in particular due to considerations such as acculturation. Online shopping, drone delivery, mobile markets, and other emergent innovations provide opportunities for evaluation and advancement of rural food access and healthy eating.

Consumer diet-related behaviors (e.g., food shopping, meal preparation) depend on a variety of individual, social, environmental, and policy factors. Rural disparities persist, in terms of diet quality, food insecurity, and nutrition-related health conditions, indicating the need for increased funding for effective, sustainable projects, programs, and interventions tailored to rural areas to reduce barriers to healthy eating.

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Related Chapters:

Chapter 4. Obesity and Physical Activity in Rural Settings
Chapter 9. The Impact of Diabetes on Rural Americans
Chapter 18. Rural Health Issues in Child and Adolescent Development

Suggested Chapter Citation:
PART 1. CHAPTER OVERVIEW

Drawing on Healthy People 2030 goals and objectives for older adults (see Table 1 for relevant Healthy People 2030 goals and objectives addressed in this chapter), we cover priority topics related to aging, especially in the context of rural aging. In addition to contextualizing the health and social status of older adults in rural America, we discuss challenges to successful aging and provide examples of potential solutions to these challenges.

While we address many critical aspects of successful aging in this chapter, it is impossible to cover all relevant topics. As such, we encourage the examination of additional resources from the U.S. National Institutes of Health (NIH), including the National Institute on Aging (NIA) Health Disparities Framework, U.S. Centers for Disease Control and Prevention (CDC), National Council on Aging (NCOA), Administration for Community Living (ACL), Rural Health Research Gateway, and other relevant resources.

1.1. SCOPE OF THE PROBLEM

- Aligned with the Healthy People 2030 goal to ‘improve health and well-being for older adults’, we highlight several key concepts important for successful aging.

- The population of older adults continues to grow throughout the U.S., necessitating solutions to multi-faceted issues linked with complex health-related outcomes.

- While chronic disease continues to dominate the leading causes of death for older adults, unintentional injury and infectious disease (e.g., COVID-19) are also significant contributors.

- Social disconnectedness and social isolation impact older adults in multiple ways.

- Solutions to common issues should be addressed from a variety of sectors and in multiple complementary ways (e.g., policy solutions, built environments, evidence-based programing).

- Aging is not simply a rural health issue, but a broader issue affecting people in all locations, and as such many aspects covered here are relevant for older adults in both rural and urban areas.

- People and places are unique with much of the available data limited to use of largely aggregated measures (e.g., by race and rurality) that may fail to capture all salient issues; albeit the points made in this chapter highlight valuable insights considering measurement limitations.

- The intersectionality of lived experiences across the life course indicates, in part, that noted variations in race, ethnicity, rurality, age, etc. may not represent the lived experience of many, given individuals may identify in many unique combinations of available measures.

- We recommend continued progress in measurement (e.g., better measurements, better data, more representation) and, therefore, the ability to consider more appropriate solutions based on tailored evidence-based information.
PART 2. INTRODUCTION

The population in the United States has seen, and continues to see, the proportion of older adults grow. This leads to many new opportunities such as intergenerational and economic engagements, but also unique challenges related to health and well-being. While not all issues covered here are unique to rural areas, rural America does face many critical barriers in access to health care and economic challenges due in part to population loss, discussed in greater detail in this chapter. We first examine the leading causes of death and briefly review patterns of population movement. We then discuss demographic characteristics and selected special topics concerning aging and rurality. Finally, we conclude with potential strategies to address some of the identified issues.

2.1. LEADING CAUSES OF DEATH AMONG OLDER ADULTS AND OTHER KEY INDICATORS

Examining the leading causes of death of older adults is one way to highlight the unique challenges facing older Americans, as well as unique considerations for rural Americans. Based on data from 1999 to 2020, the leading causes of death among those aged 65 and older include heart disease, cancer, COVID-19, cerebrovascular diseases, Alzheimer’s Disease, chronic lower respiratory disease, diabetes, unintentional injuries, kidney disease, influenza and pneumonia, Table 1. Healthy People 2030 – selected “Older Adults” objectives.

Table 1. Healthy People 2030 – selected “Older Adults” objectives.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Selected Objectives</th>
<th>Status</th>
<th>Topic area partially addressed in this chapter</th>
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<tbody>
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<td>Increase the proportion of older adults with physical or cognitive health problems who get physical activity — OA-01</td>
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<td></td>
<td>Reduce the rate of hospital admissions for diabetes among older adults — OA-05</td>
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<td>Dementias</td>
<td>Increase the proportion of older adults with dementia, or their caregivers, who know they have it — DIA-01</td>
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<td>Reduce the proportion of preventable hospitalizations in older adults with dementia — DIA-02</td>
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<td></td>
<td>Increase the proportion of adults with subjective cognitive decline who have discussed their symptoms with a provider — DIA-03</td>
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<td>Injury Prevention</td>
<td>Reduce fall-related deaths among older adults — IVP-08</td>
<td>Getting worse</td>
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<td>Reduce the rate of emergency department visits due to falls among older adults — OA-03</td>
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<td>Osteoporosis</td>
<td>Reduce hip fractures among older adults — O-02</td>
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<td>Respiratory Disease</td>
<td>Reduce the rate of hospital admissions for pneumonia among older adults — OA-06</td>
<td>Baseline only</td>
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and Parkinson Disease, among others. While we do not discuss all leading chronic diseases in this chapter, we provide specific examples which can, in part, provide broader insights for other issues. For example, diabetes affects millions of older adults in the U.S. Of older adults aged 65 years or older, about 30% (15.9 million) have diabetes and 49% (26.4 million) have prediabetes or are at high risk of developing type 2 diabetes. Additionally, those who live in underserved areas such as some rural communities are disproportionately affected by diabetes and diabetes-related comorbidities.

While chronic diseases make up a substantial portion of those listed as leading causes of death among older adults, other types of causes of death are also included. For example, unintentional injuries, such as falls are a major issue facing older adults. Falls and the associated risk of falls can play a complicated role in ones’ life that can result from and lead to many other health-related issues. Researchers, therefore, suggest that while treatment is critical, prevention should target causal factors leading to falls. Other items on the list of leading causes of death among older adults, that are not currently considered chronic diseases, include COVID-19 and influenza and pneumonia. Given the global reach of COVID-19 and its especially critical role for older adults, we provide a brief discussion of COVID-19 as related to older adults’ health and the connection between COVID-19 and social isolation more broadly.

While not listed as a leading cause of death, social connectedness and related concepts are critical, including social isolation and social disconnectedness, for people of all ages, but especially for rural older adults. Social isolation is an important underlying issue that has been linked to a higher risk of premature death, dementia, depression, anxiety and suicide, and costly hospital encounters, including emergency department visits. This may be especially critical for older adults in areas with relatively lower population density, such as rural areas.

2.2. CONTEXTUALIZING RURALITY

Residents of rural areas, given the uniqueness of several population metrics such as socioeconomic characteristics and geospatial features (e.g., longer distances to certain resources, limited availability or variable quality of available resources) when compared to their urban counterparts, may face additional challenges. While we utilize common terms such as rural or nonmetropolitan, which may carry different definitions depending on the unit of analysis (e.g., county, ZIP Code, Census Tract) and measure of rurality used (e.g., Rural-Urban Commuting Area Codes (RUCA), Rural-Urban Continuum Codes (RUCC), Urban Influence Codes (UIC), National Center for Health Statistics or NCHS Urban-Rural Classification Scheme for Counties), we also recognize significant heterogeneity in rural environments making each community unique. Thus, we encourage the reader to consider the limitations of providing this broad overview of several key items important to older adult health for the purpose of emphasizing rural populations and comparisons to more urban or metropolitan areas.

PART 3. DEMOGRAPHIC COMPOSITION OF OLDER ADULTS

3.1. BRIEF OVERVIEW OF KEY SOCIO-DEMOGRAPHICS ACROSS PEOPLE AND SPACE

3.1.1. Geospatial Clusters of Older Adults and Patterns of Population Movement

The geospatial distribution of older adults throughout the U.S. indicates clustering in areas of the Southeast, West, Midwest, and Northeast. Some states included larger clusters of older adults, where within the Southeast region of the U.S., Florida stood out as having several clusters throughout the state. Overall, older adults moved less often than younger adults and among those moving, older adults were more likely to move shorter distances. Interestingly, among older adults, those with a disability were more likely to move, indicating a 63% higher likelihood of moving during the past year compared to those without a disability. In terms of population movement by state in the U.S., census estimates suggested that Florida had more net migration than any other state (typical year, 2015–2019). Most of those moving to Florida originated from New York, Pennsylvania, and Michigan; while those moving to Arizona mostly originated from California, Washington, and Minnesota.
In addition to these broader regional patterns of movement, rural America has faced significant population loss.\textsuperscript{37} For example, among those aged 20-24, there was a 28\% decline in nonmetropolitan areas, as compared to an 8\% decline in metropolitan areas.\textsuperscript{37} Identifying ways to reverse some of this population decline holds relevance for local economies (e.g., social capital, human capital, financial capital),\textsuperscript{37} social isolation, and opportunities for intergenerational interactions to increase social connectedness. In addition, due to these population losses, rural communities are challenged with fewer individuals who can work, declines in revenue, and an overall aging population.\textsuperscript{37}

3.1.2. Patterns of Change among the Physician Workforce

While the above patterns of movement impact both urban and rural areas, there are more specific considerations within rural areas in terms of the health care workforce. For example, in terms of the availability of physicians, evidence suggests that the majority (66\%) of Health Professional Shortage Areas (HPSA) for Primary Care and HPSAs for Mental Health (62\%) were in rural (or partially rural) areas as of 2018.\textsuperscript{38} In addition, while the overall supply of physicians in rural areas increased by 3\% between 2000 and 2017, younger physicians (<50 years of age) decreased by 25\% during the same period, within rural areas. On the other hand, there was a 12\% increase in younger physicians in urban areas during the same time.\textsuperscript{38} In terms of the projected change in the size of the rural physician workforce, some findings suggest that the workforce will decrease by an estimated 23\% from 2017 to 2030, with much of this change driven by those physicians aged 45 and older (of which a significant portion is expected to retire by 2030). This finding is in contrast to urban areas with relatively stable estimates along the same timeline.\textsuperscript{38}

3.1.3. Racial and Ethnic Composition of Older Adults

We describe comparisons by race and ethnicity in this chapter due to the critical historic and contemporary inequities identified by these categorical classifications. At this same time, we recognize that use of aggregation is a practical solution to identifying important epidemiological trends. We also recognize that individuals are unique and larger aggregations may lose critical information and are therefore significantly limited in nature, albeit still of relevance when tracking changes over time. The proportion of older adults represented by non-Hispanic White individuals is projected to change from an estimated 76\% to 55\% from 2020 to 2060.\textsuperscript{39} By 2060, it is estimated that 21\% of older adults will be of Hispanic ethnicity, followed by 14\% for Black or African American individuals, and 9\% for Asian individuals. As of 2019, 24\% of those aged 65 and older were classified as being a member of a racial or ethnic minority population.\textsuperscript{40} The highest percentage of those aged 65 and older by race and ethnicity reported was non-Hispanic Asian American (13\%), followed by non-Hispanic African American (12\%), non-Hispanic American Indian or Alaska Native (12\%), non-Hispanic Native Hawaiian and Other Pacific Islander (10\%), Hispanic (8\%), and persons identifying as two or more groups (6\%).\textsuperscript{40}

In terms of rurality, evidence suggests that among rural areas certain racial/ethnic minority groups (excluding individuals identifying as Asian and Native Hawaiian and Other Pacific Islander) experienced a higher likelihood of reporting their health as fair or poor, being obese, and foregoing medical care in the past 12 months because of cost as compared to non-Hispanic White individuals.\textsuperscript{41} Furthermore, among rural areas, all racial/ethnic minority groups included in a national analyses were less likely to indicate they had a personal health care provider, as compared to non-Hispanic White individuals.\textsuperscript{41}

3.1.4. Life Expectancy at Age 65

An examination of inequities in life expectancy beyond age 65 provides important insights. Overall, additional life expectancy at age 65 in the U.S. was approximately 20 years - 20.8 years for females and 18.2 years for males.\textsuperscript{42} Additionally, life expectancy at age 65 was estimated to be 18 years for Black individuals compared to 19.4 years for White individuals, and 21.4 years for Hispanic individuals in a recent report.\textsuperscript{39} In terms of geospatial comparisons in life expectancy at age 65, some evidence suggests that gains in life expectancy, while promising overall, were not equal across geography.\textsuperscript{43} In fact, analyses covering the years 2000-2016 identified that
individuals residing in nonmetropolitan areas had smaller relative gains, as compared to individuals residing within larger metropolitan areas and that overall, metropolitan status was a stronger predictor of changes in mortality than region. This highlights an important issue of inequity facing older adults by sex, race, ethnicity, and rurality across the U.S.

**PART 4. SELECT EXAMPLES OF CHALLENGES FACING OLDER ADULTS**

### 4.1. CHRONIC DISEASE

#### 4.1.1. Alzheimer’s Disease and Related Dementias (ADRD)

Alzheimer’s Disease and related dementias (ADRD) are on the rise, with nearly all cases occurring among those aged 65 and older, albeit with a growing concern for early-onset dementia affecting those younger than 65 years. Current estimates put the expected number of older adults with Alzheimer’s Disease at 13.8 million by 2060, up from an estimated 6.1 million in 2020. In terms of hospital encounters, individuals aged 65 and older with ADRD had higher rates of hospitalization than those without ADRD. Thus, health care utilization and thereby access to health care resources are of critical need for those with ADRD.

Given a higher need and utilization of health care resources for those with ADRD, having adequate resources in place and accessible for those with ADRD and their caregivers becomes critical. Overall, an estimated 20 states in the U.S. are labeled “dementia neurology deserts” indicating fewer than 10 neurologists per 10,000 individuals with ADRD by 2025. As additional support for the aforementioned shortages of physicians in rural areas, some evidence suggested that a lack of specialists was reported by 71% of primary care physicians located in rural areas, compared to 63% in small cities/towns, 54% in suburbs near a large city, and 44% within large cities. In addition, recent evidence suggests that the ‘risk-adjusted ADRD diagnostic incidence’ rate was higher among rural counties (versus metropolitan areas) and that this higher rate was present even though the overall prevalence was lower. Additionally, among those with diagnosed ADRD as of 2008, there was longer survival among those living in metropolitan areas as compared to those in rural and micropolitan areas. Thus, access and utilization of health care resources for those with ADRD remains a challenge in rural areas, indicating another important issue highlighting inequities facing rural residents.

#### 4.1.2. Type 2 Diabetes

Diabetes, among the leading causes of death for older adults, imposes a substantial economic burden on the healthcare system and older adults. It was estimated that in the U.S., the total cost of diagnosed diabetes in 2017 was $327 billion including $237 billion in medical costs and $90 billion in lost productivity. It was also reported that medical expenditure estimates among those with diagnosed diabetes were approximately 2.3 times that of those without the diagnosis. The average per capita cost of medical care for individuals aged 65 years or older with diabetes was estimated to be $13,239. The majority of older adults are covered under Medicare for their primary health care coverage. Medicare plays a vital role in diabetes prevention and diabetes care and management for older adults with estimates of Medicare spending $42 billion more on diabetes in 2016 than it would have otherwise if those same individuals did not have diabetes.

The overall diagnosed diabetes rates varied by race and ethnicity, where the highest rates were reported among American Indian/Alaskan Native (14.5%), followed by non-Hispanic Black (12.1%), Hispanic (11.8%), Asian (9.5%), and non-Hispanic White (7.4%) individuals. Inequities were also present by rurality, where analyses using data spanning 1999-2018 found diabetes mortality rates were higher in rural areas than urban areas. Additionally, rural adults aged 65 and older are less financially secure than their urban counterparts, have a higher percentage of low or moderate incomes, and have about half the household assets of urban older adults. Thus, identification of inequities by race, ethnicity, and rurality, indicates a critical need to consider multi-faceted solutions for diabetes prevention and management.

#### 4.2. FALLS

As the leading cause of injury-related morbidity and mortality among older adults in the U.S.,
falls accounted for approximately 950,000 hospitalizations (including transfers to another medical facility) and 32,000 deaths in 2018. In 2018, 27.5% of older adults experienced at least one fall, resulting in 35.6 million total reported falls and 8.4 million fall-related injuries. A higher percentage of these reports came from rural residents compared to urban residents, especially among older adults ages 65-74 years, which demonstrates that rurality is an important determinant of falls among older adults. The World Health Organization (WHO) attributes the association of rurality and falls to socioeconomic factors, specifically low and unreliable income; however, other risk factors include lack of access to healthcare services, higher rates of chronic illness, lack of nutritious food options, and inadequate environments for safe walking, all of which are in need of further exploration to determine the quantitative differences in these variables based on rurality. Other risk factors include advanced age; visual, auditory, and cognitive impairments; medication use; and environmental characteristics such as poor lighting and flooring that inhibit mobility.

The financial consequences of this susceptibility can be catastrophic, and the economic burden of falls is expected to increase in the coming decade, with medical expenditures for fatal falls reaching over $101 billion by 2030. Using the CDC’s Web-based Injury Statistics Query and Reporting System (WISQARS) and the U.S. Census Bureau's population projections, the estimated number of annual fatal falls could reach 100,000 by 2030, indicating that unintentional falls will continue to pose a substantial public health threat without effective interventions, which are less available and accessible in rural areas. Therefore, rural communities should invest in preventive infrastructure including safer walkways, better outdoor lighting, and more robust physical and/or occupational therapeutic services to minimize the effects of fall-related morbidity and mortality.

4.3. OTHER SPECIAL ISSUES

4.3.1. COVID-19 and Rurality

COVID-19 impacted life in nearly every part of the world, including both rural and urban areas, with evidence of a differential impact such that the incidence rates in 2020 were higher in urban versus rural areas in certain regions (northeast, Mid-Atlantic), yet this shifted later in the pandemic where COVID-19-related mortality rates rose. Other analyses suggested that among those with COVID-19, residents in rural communities were more likely to be hospitalized, suffer mortality, or suffer other adverse outcomes than those in urban areas.

4.3.2. COVID-19 Social Distancing Effects on Older Rural Adults

To limit the spread of COVID-19, social distancing protocols were utilized across the country and elsewhere. Particularly for populations that would be most impacted by infection, these protocols became a prominent part of daily life. Older adults were encouraged to reduce interactions with others which resulted in an increase of social isolation. Additionally, older adults in rural areas may have fewer social relationships, yet with higher value placed on those relationships. Thus, the impact of reducing or restricting communal and social opportunities for interaction should be monitored for impacts on rural older adults.

During a multi-year study of data from the Health and Retirement Study, loneliness was associated with a 40% increased risk of dementia regardless of race, gender, ethnicity, education, or genetic risk factors. A 2018 meta-analysis indicated that loneliness was linked to all-cause mortality. Furthermore, a recent report, listed rural residents, among others, as at-risk groups in terms of social disconnection. In addition, some evidence suggests an increased risk of suicide associated with rural residence. Limited access to preventive or emergency services which are compounded by sociocultural factors make suicide among rural communities a public health concern. Thus, social disconnectedness, loneliness, and geographical location play a significant role in the health and well-being of rural residents.

While protocols were implemented to limit the impact of COVID-19, they also exacerbated the negative effects of reduced socialization. Pre-existing conditions such as memory loss and physical abilities were reported to be amplified.
Additionally, the absence of social interaction through visitations created a void of supplemental care which increased the burden of care on healthcare workers.\textsuperscript{72} While adjusting to the protocols of COVID-19, communication between staff and patients became important for the safety and well-being of patients due to the increased dependence on interactions between the two and reduced interactions between friends and family.\textsuperscript{72}

4.3.3. Native American Populations and Rurality

We briefly examine this rather complex topic yet note that it would be impossible to fully consider all relevant items in the space provided. Per the Bureau of Indian Affairs (BIA), as of the writing of this chapter, use of the terms “American Indian” and “Alaska Native” carries specific considerations reflecting, in part, the unique history of Native Peoples within what is now, largely the U.S., and in consideration of services (funded or directly provided by) the BIA.\textsuperscript{73} In addition, per the National Museum of the American Indian, “American Indian, Indian, Native American, or Native” are acceptable and often used interchangeably in the U.S.; however, Native Peoples often have individual preferences on how they would like to be addressed”.\textsuperscript{74} Per a recent National Congress of American Indians report, approximately “574 sovereign tribal nations (variously called tribes, nations, bands, pueblos, communities, and Native villages) have a formal nation-to-nation relationship with the U.S. government”.\textsuperscript{75} This large number of diverse individuals and nations creates a significant challenge for interpreting key statistics using broad categories from empirical data grouping nearly 600 individual tribal nations with varying health-related outcomes, resources, locations, and history. However, as of the writing of this chapter, even in light of these major considerations, data at a more micro scale with relevant detail to allow for tailored findings is largely absent in large national surveys. Thus, we provide some key statistics using the more limited classifications available at this time.

We discuss this topic in this chapter, because of the expected increase in the population of American Indian and Alaska Native (AI/AN) individuals aged 65 years or older and the significant health equity issues related to this group. AI/AN individuals are expected to increase from roughly 0.5% of the older adult population in 2017 to nearly 0.7% by 2060,\textsuperscript{76} representing a more than doubling of the number of individuals, from 272,250 to more than 648,000.\textsuperscript{77} Moreover, 29% of individuals identified as American Indian compared to 15% of individuals in the total population\textsuperscript{78} resided in rural areas. In addition, rural disparities in death rates were highest among AI/AN populations,\textsuperscript{79} between 2013 and 2017. In the same study, analyses of multi-year trends demonstrated a disproportionate mortality rate for unintentional injury present among AI/AN populations that was higher than any other population by race and ethnicity and by rural location.\textsuperscript{79} Furthermore, barriers in accessing healthcare services facing both Native American individuals residing in rural areas and the larger rural population include longer distances, transportation barriers, limited resources and facilities, and limited supplies of health care professionals.\textsuperscript{80} Furthermore, even after adjusting for rurality and other factors (e.g., income, education, state, population aged 65 and older), areas with higher concentrations of Native American individuals experienced greater distances to providers, and lower screening rates for specific cancers in a large national study.\textsuperscript{81} Furthermore, another national study identified poorer quality of Medicare-certified home health care in areas with higher concentrations of Native American individuals across multiple quality indicators, even after adjusting for rurality.\textsuperscript{80}

4.3.4. Social Connectedness and Social Isolation

In a recent report by the U.S. Surgeon General, among the cited groups that were at highest risk for social disconnection were rural residents, individuals from racial and ethnic minority groups, and other noted populations.\textsuperscript{82} In addition, social isolation, while integrated throughout this chapter in multiple ways, is also briefly covered here. Social isolation is both modifiable and linked to negative health-related outcomes,\textsuperscript{82} making it critical to assess. There is currently mixed evidence about variation in social isolation by rurality. For example, some evidence from a national sample indicated that the rates of social isolation were 21% lower in urban areas as compared to rural areas, albeit without evidence of a significant difference, which the authors point out may be due a small sample of “non-
In contrast, another study with a national sample identified less social isolation among rural residents as compared to urban residents. However, this same study identified that among rural residents, individuals identified as non-Hispanic Black, were more likely to report loneliness than non-Hispanic White individuals.

In light of these results, and other existing evidence of the role of individual-level factors and place-based factors, we recommend continued surveillance considering multiple factors such as race, ethnicity, age, U.S. Census Region, multiple measures of rurality, and using multiple measurement levels (e.g., ZIP Code, County) in assessing social isolation in future studies.

**PART 5. EXAMPLES OF INTERVENTIONS AND POTENTIAL SOLUTIONS TO CHALLENGES FACING OLDER ADULTS**

There are several potential solutions to issues facing older adults, given no single item is likely to provide a solution to any one issue comprehensively. What we provide here is by no means an exhaustive discussion, albeit we do provide several items for consideration that will be critical for diverse stakeholder groups with an interest in healthy aging issues.

Broadly speaking, investment in health care resources, especially in under-resourced areas of the country, are critical, especially to combat health inequities. These healthcare resources should span the continuum from prevention to treatment to recovery services. Furthermore, investment in and promotion of research by NIH, the Alzheimer’s Association, and other major research funders will continue to be critical, especially for research that examines health inequities. More specific recommendations are provided in what follows.

### 5.1. POLICY AND COMMUNITY INTERVENTIONS

#### 5.1.1. Policy Considerations for Novel Issues related to COVID-19 and Social Isolation

Emergency management strategies for future potential situations similar to the COVID-19 pandemic should observe precautionary measures that can be taken to limit the impact of reduced socialization. While physical isolation may reduce immediate threats of exposure, it may paradoxically lead to limited interactions essential for older adults’ social and emotional well-being, functional support, and resource utilization. Many older adults depend on social networks as a primary resource for retaining a healthy ability to age in their communities. It is suggested that “connection plans” be developed to retain communication with older adults and their social network. This will provide a predetermined hierarchy and formation of communication to friends, family, and medical personnel. This should be paired with a “safety plan” to predetermine responses if there is a failure in the “connection plan” or if the older adult is found to need services. Additionally, there is a need for campaigning for a de-stigmatization of mental health utilization in rural communities. Public health messaging on how to access mental health services in rural areas can be key to overcoming sociocultural factors that prevent utilization of mental healthcare and crisis support services.

A review of publications related to COVID-19 noted the effects of quarantines and revealed suggestions to mitigate negative impacts. Isolation should be monitored for necessity and should be reduced in the time of quarantine to what is deemed necessary. Additionally, information should be readily available and provided to individuals in isolation that provides the rational for time in isolation. Supply availability should also be considered while individuals are in isolation to mitigate issues pertaining to food security and medical stability.

Technological difficulties may inhibit people with communication difficulties such as sight or hearing loss from utilizing telemedicine options. However, the usage of alternative communication methods can ease the impact of reduced socialization and was shown to be accepted by the patients in medical facilities even for people with minor cognitive declines. Further consideration and research are needed to combine the use of technology with established Age-Friendly Health Systems which can be pivotal in meeting the needs of older adults in rural areas. A report of the Alzheimer Society of Canada Task Force concluded that while still early in research development, video-based telecommunication can yield promising and
reliable results for neuropsychological testing which suggest that this method can influence the future design of remote care.93,94

5.1.2. Evidence-Based Programs

Evidence-based programs delivered to community-dwelling adults remain critical, given their science-based approach to improving the health of adults throughout the nation.95 We take one disease type as an example of the potential for policy interventions, but we realize this one example may not fully represent the extent of solutions needed for this disease or others. To prevent or delay type 2 diabetes and reduce diabetes-related complications, an evidence-based intervention such as Diabetes Self-management Education and Support (DSMES) for those with diabetes, and the National Diabetes Prevention Program (NDPP) for those with prediabetes, are recommended by the American Diabetes Association (ADA) and the CDC. However, reports have shown that the participation in both interventions have been low among older adults; although both programs are covered benefits for Medicare beneficiaries.96-100 Older adults living in rural communities with access disparities in health care and providers, need strategies and policies that can be implemented to improve the uptake of both programs. The CDC has been leading several efforts to mitigate this public health issue. For example, State Public Health Actions (SPHA-I305), a cooperative agreement, provided strategies for healthcare systems and communities to prevent and reduce chronic disease and associated complications.101 One of the key goals of the SPHA-I305 was to increase access to and participation in DSMES.101 A similar program-DP17-1705, also implemented by CDC, aims to scale up NDPP in underserved areas.102 Both of these cooperative agreements show the effort by the CDC to promote DSMES and NDPP to reduce the diabetes burden. Yet, more efforts are needed due to the complexity of the disease, particularly with local communities and organizations’ involvement in implementing evidence-based strategies and policies that can increase the participation of both programs.

For rural communities, with fewer resources and providers, organizations may face challenges in the application process for accreditation and recognition for their DSMES programs by the American Association of Diabetes Educators (AADE) and American Diabetes Association (ADA).103 Targeted technical assistance for rural organizations from Centers for Medicare and Medicaid Services (CMS) or the CDC to support and streamline the processes of AADE accreditation and ADA recognition should be considered.103 Lack of availability of the programs in rural areas also is a key concern. The use of telehealth to improve the accessibility of DSMES in rural areas can be a viable option.104,105 However, only 38% of rural counties had DSMES.104 Additionally, virtual delivery of the program may help reduce the burden on rural organizations with possible sharing of resources such as a certified diabetes educator working among different organizations when applicable.105 While DSMT was allowed to be delivered via telehealth during the COVID-19 Public Health Emergency (PHE), CMS has not committed to continuing the current telehealth policies beyond PHE.106,107 Awareness campaigns highlighting the need and availability of the programs should be communicated to providers, rural communities, and local organizations to ensure the utilization and sustainability of DSMES for rural residents.108

5.1.3. Built Environmental Interventions

Activity-Friendly, Age-Friendly, and Dementia-Friendly Communities. Features of the built environment are shown to influence various health behaviors and outcomes directly and indirectly. Older adults are more vulnerable to environmental risk factors, and therefore supportive community environments are prerequisite to promoting their health and well-being. A rich body of literature shows that neighborhood environments can serve to promote or hinder community-dwelling older adults’ physical activity, social interactions, and mobility, which can impact their long-term health and quality of life. Studies show that walkability of the neighborhood, such as sidewalk availability, proximity to destinations, availability of recreational facilities, and high visual quality, are significantly correlated with older adults’ walking, physical activity, and overall perceived health status.109-114 More detailed conditions like walking surfaces, crossing conditions, lighting, and benches were
also shown to impact older adult’s walking and other healthy outdoor activities and reduce the risk and fear of falling. Despite increasing policy efforts and programs on dementia-friendly and intergenerational communities, empirical evidence is relatively limited. A recently published systematic review summarizing findings from 37 studies concluded that evidence exists to support the significant role of the neighborhood built environment in general, but lacks in determining the specific measures/contexts linked with specific cognitive health and dementia risk variables. However, more consistent evidence was found for the measures related to parks and green spaces in urban communities in improving cognitive health or reducing dementia risks. Urban-rural differences were also discussed in this review study, but with inconsistent or insufficient results. A recent study identified high-speed streets and traffic-related safety was negatively correlated with older adult’s social interactions, especially for intergenerational interactions with children. These strategies are needed in both rural and urban areas, albeit the implementation of these strategies will likely need to be tailored to a given community, regardless of the location, based on the relevant needs, resources, and other considerations. For example, variation in population density (which is typically lower in rural areas), personal preferences, etc. may drive certain choices (e.g., density of benches in the city center) and should be considered by various stakeholders in creating resources that are welcoming for residents, especially those with unique needs.

The WHO has provided guidance for age-friendly community designs that are relevant to both rural and urban areas. This guidance is meant to aide stakeholders (e.g., urban planners, city planners) around the world in better identifying and implementing smart community designs with features within built environments that can aide older adults as they navigate their community. Examples of community design indicators highlighted include equity measures and age-friendly environment outcomes, with emphasis on the impact on well-being. The creation of and/or maintenance of age-friendly environments plays a role in multiple aspects of successful aging. For example, communities considered as more walkable were associated with higher levels of moderate-to-vigorous physical activity and also higher levels of transport activity and lower body mass index, as compared to areas that were less walkable. Reaching adequate levels of physical activity is critical for elder health in multiple ways. For example, evidence suggests that not meeting physical activity guidelines was associated with poorer physical and mental health among older adults. Thus, considerations into how to create and sustain age-friendly environments in all areas of the country and beyond should be strongly considered.

**Social Isolation and Intergenerational Interactions.** Designing age-friendly environments includes ways to lessen the likelihood of social isolation, a critical barrier to successful aging. Intergenerational interactions can be one of many ways to lessen the likelihood of social isolation, especially among older adults, and can bring mutual benefits to both older and younger individuals. These intergenerational interactions can, among other things, provide opportunities to engage in physical activity, build social relationships, improve well-being, and can even act to promote cognitive function. To facilitate intergenerational interactions, it is essential to strengthen social infrastructures in rural communities and introduce pro-connection public policies that can create a culture of connection. Thus, these built environmental interventions more broadly hold promise for millions of older adults within and outside of rural areas and, what’s more, can work to promote healthy lifestyles (e.g., promotion of physical activity and social interactions) among people of all ages.

**PART 6. CONCLUSIONS**

Every person alive today is aging and as such are stakeholders on this topic. Older adults face challenges that are unique in many ways, highlighted in part, within this chapter. At the same time, some of these challenges, such as social connectedness and social isolation, can be aided in many ways, including, but not limited to the information included within this chapter (e.g., age-friendly community designs). Unique health inequities face older rural residents. In many cases rurality geospatially overlaps with
other disadvantaged population indicators such as historically marginalized racial or ethnic populations, and/or populations with lower socioeconomic status, creating a double or triple jeopardy. The intersectionality of individuals’ lived experiences over time and places creates complications for analyses in that one cannot perfectly disentangle this experience into single compartmentalized classifications (e.g., race, ethnicity, rurality). As such, we recommend embedding and disseminating evidence-based programs, policies, and environmental interventions that resonate with rural populations and that are sensitive to the uniqueness of individuals’ lived experiences in critical ways. We further recommend continued public health surveillance of progress or the lack thereof on the topics covered in this chapter, especially for the millions of older adults residing in the rural U.S.

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Related Chapters:
Chapter 3. Rural Healthcare Access and Quality
Chapter 8. Rural Preventive Care: Routine Screenings, Prenatal Care, and Oral Health
Chapter 9. The Impact of Diabetes on Rural Americans
Chapter 17. Health Insurance for Rural Americans
Chapter 19. Hospital and Emergency Services in Rural Areas

Suggested Chapter Citation:
Prevention, in general, refers to activities and methods to avoid detrimental life-shortening or life-altering health conditions (primary prevention), or to conduct early detection of disease (secondary prevention), with a focus on minimizing disease burden. Many of the priorities in Healthy People, a decades-old program of the U.S. Department of Health and Human Services (DHHS), have addressed disease prevention through recommendation of lifestyle modifications, as well as routine health screenings, vaccinations, prenatal and maternal care, and dental healthcare services. Utilization of preventive care services has been shown to reduce risk for developing chronic disease, disability, or premature death, making it a priority for all communities in America.

According to Healthcare.Gov, preventive health services encompass routine clinical activities such as “screenings, check-ups, and patient counseling to prevent illnesses, disease, or other health problems.” Preventive healthcare services include three categories of first-level clinical services: those pertaining to all adults, services uniquely tailored to women, and those tailored to children. However, a 2018 study by Borsky and colleagues reported that only 8% of adults aged 35 and older had participated in all of the high-priority screening services recommended to them, and 5% had participated in none. The current Healthy People 2030 objectives for preventive care are intended to increase Americans' focus and action towards reducing the risk of untimely death, or diseases and disabilities that impact quality life-years and lead to unnecessary healthcare costs.

Preventive health care is both critical and timely, as all Americans need access to a regular source of care for assessing current health status and...
healthcare needs. The Centers for Medicare and Medicaid Services (CMS) reports the following about preventive care in America:19

“High-quality preventive care helps Americans stay healthy, avoid or delay the onset of disease, lead productive lives, and reduce costs. And yet, despite the proven benefits of preventive health services, too many Americans go without needed preventive care because of financial barriers. Even families with insurance may be deterred by copayments and deductibles from getting cancer screenings, immunizations for their children and themselves, and well-baby check-ups that they need to keep their families healthy.”

Under the Affordable Care Act (ACA), now more than a decade old, health insurers are required to provide certain preventive services with no required cost-sharing, such as pediatric care, immunizations, mammograms, cervical cancer screenings, and prenatal care.20 Most immunizations are considered routine and covered under the ACA and Title V of the Maternal and Child Health Services Block Grant Program.21,22 All individual state Medicaid programs are required under federal law to provide immunization services to individuals from birth through age 20 through the Early and Periodic Screening, Diagnostic, and Treatment program (EPSDT), which also includes vision and hearing screening services. During the COVID pandemic, the Medicaid and CHIP Payment and Access Commission issued policy guidance for Medicaid coverage of COVID-19 vaccines and testing.23,24 Both Medicaid and Medicare are required to cover COVID-19 testing, vaccines, and treatment for beneficiaries and, under the American Rescue Plan Act, may not charge for these services.25 Likewise, routine preventive dental services are recommended under the EPSDT. Unfortunately, shortages of primary care providers and dentists, in almost all rural regions of the U.S., contribute to disparities in access to the recommended services.6,9

In sum, rural disparities in equitable access to preventive health care continue to exist owing in large part to differences in states that have expanded access to health care for their citizens under ACA Medicaid expansion versus those states which have not expanded access to Medicaid.26 As of November, 2023, a total of ten states had not expanded access to Medicaid.27 Many of the states that have opted not to expand Medicaid eligibility under the ACA are largely rural with a majority of non-expansion states located in the southern U.S.27,28

Rural-urban differences in outcomes such as immunization uptake,10,11,29 maternal mortality,12 and use of oral health prevention services13 are indeed striking across the U.S. In this chapter, three areas of rural preventive care will be examined: (1) routine health screenings, with an emphasis on newborn and childhood screenings; (2) prenatal and maternal care; and (3) oral health services across the lifespan. These important topics will be discussed with a focus on rural-urban contrasts, disparities, and barriers to care.

RHP 2030 SURVEY OUTCOMES

The importance of preventive care was reflected in results of the Rural Healthy People 2030 survey, this decade’s nationwide survey of rural stakeholders (n=1,291).1 Results of this online survey ranked “Preventive Care” as a top 20 health-related priority for rural Americans (i.e., 7th place ranking, in a tie with the topic “Older Adults”).1 When results of the survey were evaluated by gender and age group, it was noted that female respondents ranked preventive care higher than male respondents (8th versus 11th), while younger adults (age 18-34) ranked preventive care as a higher priority than adults 65 years and older (7th versus 9th).2

Preventive care had not been included as a stand-alone Healthy People 2020 topic area a decade earlier, nor in previous iterations of the Rural Healthy People survey.30 However, many aspects of preventive care including prenatal care, oral health, and immunizations were ranked as top 20 priorities a decade earlier, namely, Maternal and Child Health (9th place ranking).31 Oral Health (13th),32 and Immunizations and Infectious Disease (15th).33

RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

Among its priorities for the current decade, Healthy People 2030 conveys a focus on encouraging and assisting children, mothers and fathers, and people of all ages to understand
and seek to adhere to recommended preventive healthcare guidelines. The overall Healthy People 2030 goal for preventive care is to “help people get recommended preventive healthcare services.” There are 34 Healthy People 2030 objectives aimed at addressing preventive care. Nineteen of the preventive healthcare objectives have insufficient, baseline-only, or no data available; hence, progress has not yet been tracked and reported. This includes the objectives calling for increased screening for postpartum depression and increased screening for osteoporosis in older adults.

Among objectives with sufficient tracking data, five preventive care objectives are trending worse, six have little to no change, three are improving, and the target for one objective has been achieved. That particular objective is related to increased use of the oral healthcare system, where the Healthy People 2030 target of 45% compliance to guidelines was exceeded, at 46.2%, by 2018.

Specific Healthy People 2030 objectives, that are related to this chapter’s discussion on prevention, are:

**Overall**
- Increase the number of community organizations that provide prevention services – ECBP-D07

**Routine Screenings for Children**
- Increase the proportion of newborns who get screened for hearing loss by age 1 month – HOSCD-01
- Increase the proportion of children aged 3 to 5 years who get vision screening – V-01
- Increase portion of children who received a developmental screening – MICH-17

**Prenatal and Maternal Care**
- Increase the proportion of pregnant women who receive early and adequate prenatal care – MICH-08
- Increase the proportion of women who get screened for postpartum depression – MICH-D01

**Oral Health**
- Increase use of oral health care system – OH-08
- Increase the proportion of low-income youth who have a preventive dental visit – OH-09
- Increase the proportion of children and adolescents who have dental sealants on 1 or more molars – OH-10

**ROUTINE SCREENINGS**

*Newborn and Early Life.* The American Academy of Pediatrics (AAP) Bright Futures provides evidence-based guidelines for preventive health screenings from infancy through adolescence. Their recommendations, a representative consensus of all pediatric specialists, are published annually as the *Periodicity Table.* This publication emphasizes the importance of early and regular comprehensive screening. Recommendations by the AAP concerning routine newborn exams through nine months encompass standard measurements such as infant length, height, weight, and head circumference, as well as sensory screenings. Emphasis is placed on prenatal assessment, and early (i.e., newborn) and regular pediatric preventive care with specific blood tests for certain genetic, endocrine, and metabolic disorders. Additionally, testing for congenital heart defects and hearing loss is considered part of standard care.

Early detection of sensory and developmental deficits and congenital conditions is a U.S. secondary prevention priority. In 2019, congenital hearing loss was detected in 1.7 of every 1,000 newborns screened. Although 98.4% of infants were screened in 2019, states that were predominantly rural had the lowest newborn hearing exam rates. Bush et al. (2015) reported that very rural healthcare practices were significantly less likely to perform hearing evaluations compared with less rural practices. They also noted that rural primary care providers have reported communication challenges receiving results of infant hearing screenings, and may be less confident coordinating hearing services for their young patients. In a study conducted in Kentucky, 23.8% of Appalachian newborns compared with 17.3% of non-Appalachian children failed to obtain follow-up diagnostic testing. Children from Appalachia were significantly delayed in obtaining a final diagnosis of hearing loss compared with children from non-Appalachian regions.
**Infant Mortality.** The National Center for Health Statistics data website on infant mortality shows mortality rates by state from 2005-2021, with several of the most rural states (e.g., Mississippi, Alabama, Arkansas, Alaska) having relatively high infant mortality rates. A 2020 study by Ehrenthal and colleagues found that rural infant mortality was significantly higher in both noncore (rural) and micropolitan (adjacent rural) counties than in urban counties. The authors determined that the greater socioeconomic disadvantage seen in rural areas contributed more to this difference, than lack of access to care or even lifestyle factors. In a commentary addressing infant mortality, Dr. Katy Kozhimannil noted that structural inequities, such as a lack of pediatricians, emergency care, and obstetric services, are particularly noteworthy in focusing attention on infant mortality.

**Children, Youth, and Adolescents.** The use of Extension for Community Healthcare Outcomes (ECHO) has positively impacted the way education and information are delivered to those in rural and underserved communities. For example, child development screenings recommended by the Centers for Disease Control and Prevention (CDC), and those specifically for autism spectrum disorders (ASD), were noted to improve when rural providers enrolled in ECHO Autism, a virtual learning network for primary care providers. Following participation in the virtual learning network, general developmental and autism screening rates increased from 53.3% and 68.3% to 88.6% and 99.0%, respectively. Healthy People 2030 reports that the percent of children aged nine through 35 months who were screened for ASD has increased from 31.1% in 2016-17 to 34.8% in 2020-2021.

Pediatric preventive services for youth are often focused on various risk reduction services, targeting health issues such as pregnancy prevention, substance use, human immunodeficiency virus (HIV) prevention, mental health, and sexually transmitted infections (STIs). Early detection of HIV and STIs contributes to prompt treatment and, therefore, reduced transmissions. It has been reported that rurality, adolescence, and being female is associated with increased days to treatment for STIs. A discussion on adolescent and youth behaviors, and prevention programs, is discussed more fully in Rural Healthy People 2030’s Chapter 1 on Mental Health and Mental Disorders.

**Adults.** Routine health care for all adults should include routine annual screenings, as recommended by the U.S. Preventive Services Taskforce (USPSTF) for blood pressure, weight, vaccine status, diet, depression, cancer (e.g., colorectal, breast, cervical, prostate, liver, lung, blood, and skin), as well as heart disease, sexually transmitted diseases, and metabolic disease and obesity. Recommended prevention services specific to women include screenings for gestational diabetes after 24-weeks gestation, breast cancer for average-risk women, anxiety disorder in adolescent and adult women, domestic violence, obesity, sexually transmitted diseases, and HIV, among other things. Of note, a discussion specific to cancer screening is found in Rural Healthy People 2030’s Chapter 2 on Cancer.

Older adults living in rural U.S. communities face significant challenges to accessing routine care for chronic conditions. During the 22 months of the COVID-19 pandemic, older adults faced particular challenges accessing healthcare services, as well as accessing both routine prescriptions and monitoring supplies for such things as type 2 diabetes. As a general rule, Medicare-age adults visit with a healthcare provider for ambulatory care sensitive conditions at a rate of 900 visits per 1,000 Medicare beneficiaries with type 2 diabetes mellitus. During the beginning of the pandemic, the number of visits made by Medicare-age adults to a healthcare provider decreased by 50%. With significantly fewer primary care providers available in rural areas, rural older adults need to be mindful of the need for careful planning and alternative means of accessing routine medical supplies and access to providers with laboratories. More information on the health status of older adults can be found in Chapter 7 of Rural Healthy People 2030.

**Immunizations.** Literature confirms that a gap exists in immunization rates for rural residents compared to their urban counterparts. Immunizations have been the most cost-effective and overall superior source for avoidance of vaccine-preventable diseases. Unfortunately, individuals who reside outside of metropolitan areas receive
recommended immunizations at lower rates. A 2018 CDC report demonstrated that rural children less than three years old were 2.6 to 6.9 percentage points lower in receiving recommended vaccines than their urban counterparts. Adolescent uptake of the human papillomavirus (HPV) vaccine and the second dose of meningococcal conjugate vaccine were even lower for rural residents (15.4%) compared to their metropolitan counterparts (19.7%). A study comparing rates of chlamydia, gonorrhea, and syphilis, showcased the higher likelihood of these infections in the more rural counties of the Mississippi Delta region. Barriers to preventive care and testing, and lack of access to comprehensive sexual education, are common factors among rural residents.

Addressing Barriers to Prevention Services. Significant barriers to receiving preventive services in rural areas are multifocal, but include limited access to services, transportation issues, cost, lack of insurance, and lack of primary care providers. Examples of creativity in developing access-related alternatives to preventive healthcare services include school-based health services, mobile clinical services, and telehealth. Indeed, many promising programs focused on rural school-based health services have been launched with the U.S. Department of Health and Human Services awarding nearly $25M to strengthen access to preventive health services. In addition, federal programs of the Health Resources & Services Administration (HRSA) exist to help rural and underserved areas improve access to health care by helping to address the shortage of primary care providers. Strategies to address workforce shortages include loan forgiveness programs, state recognition of nurse practitioners as primary care providers, and subsequent easing or removal of physician oversight requirements. A list of HRSA Bureau of Health Workforce programs and funding opportunities, to assist in reducing rural healthcare shortages, is available online.

A majority of states and the Veterans Health Administration (VHA) now recognize nurse practitioners as independent providers without the need for physician oversight and as a cost-effective alternative to physicians. Several studies have demonstrated that nurse practitioners practice as safely and cost-effectively as physicians. Acting on this evidence, 27 states have removed physician oversight restrictions to address primary healthcare workforce shortages. Similarly, in the VHA, a recent study analyzing nurse practitioners compared to physicians found that patients assigned to nurse practitioners experienced similar health outcomes at costs similar to physician-managed patients. In a study focused on Texas, Bolin and colleagues reported that removing oversight restrictions on nurse practitioners would eliminate the primary care provider shortage in rural areas by 2,376 providers (32%), and reduce psychiatric provider shortage by 13%, while saving the state of Texas up to $47.7 million in the first biennium, climbing to $4.6 billion over a 10-year period.

MATERNAL CARE

Importance of Prenatal Care. A healthy mother and newborn should be the number one priority for obstetrical, prenatal, and newborn care programs. The federal Title V Maternal and Child Fee-For-Service Program recognizes the need for low-income women, who may not be eligible for Medicaid, to have access to prenatal care services for the safe delivery of a healthy newborn. Unfortunately, in rural areas, access to maternal, obstetric, early newborn, and pediatric care has become more difficult with the continuing closures of rural hospitals and emergency departments.

Maternal care services should include a complete medical history, physical examination, clinical assessment, postpartum family planning, counseling and education, laboratory and diagnostic testing, and follow-up as appropriate to monitor potential risks such as abuse of mother and/or child. The Title V Maternal Child Block Grants (i.e., Title V), gives all states flexibility for designing their own systematic approach to improve health access and outcomes for women, children, youth, and families. However, Title V delegation of responsibility for prenatal and postpartum care to the states continues to leave significant coverage gaps and needs in states which have not adopted Medicaid expansion (predominantly in the South).

Immunizations. Immunization rates for influenza and Tdap (i.e., tetanus, diphtheria, and pertussis) during pregnancy are lower for rural women
(especially when uninsured), as compared to women in urban areas. This effect was compounded by rural areas with significantly reduced access to care, (such as non-Medicaid expansion states), and/or for persons with limited access to primary care providers. While pregnant women in rural areas are more likely to rely on Medicaid for prenatal care coverage, they are less likely to have access to expanded coverage, contributing to lower vaccination rates and higher communicable disease rates that could be prevented by vaccines. Also, COVID-19 vaccination rates have shown lower uptake rates among pregnant women, but especially those living in rural areas.

**Disparities in Care.** One barrier to prenatal care in rural areas is the lack of obstetric care resources or providers. As shown in Figure 1, “maternity care deserts” are prevalent across the U.S. but most profoundly so in the midwest, south, and across Ohio, West Virginia, Kentucky and Tennessee. Maternity care deserts mean there are no obstetric providers per 10,000 U.S. births. In the U.S., nearly 36% of all counties are in this category. In an effort to address these persistent “maternity care deserts”, the current Biden Administration has outlined actions the federal government will take to reduce coverage gaps, improve access to care, and address geographical access barriers for prenatal, delivery and postpartum care for women including perinatal addiction services. A contributing factor to the dearth of maternity care is the high rate of obstetric unit closures in rural hospitals. Rural areas across the U.S. have been especially hard-hit by the closure of hospital-based obstetric services and complete hospital closures.

**Maternal Mortality.** There are stark racial disparities in both maternal and infant mortality. Widely reported data show that Black women in the U.S. are nearly three times more likely to die than white women during pregnancy and the first year

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**Figure 1. Maternity Care Deserts, 2020**

Source: U.S. Health Resources and Services Administration (HRSA), Area Health Resources Files, 2021.
postpartum. Systemic factors such as implicit bias and structural racism may contribute to these disparities. Social determinants of health such as access to care, transportation, and food security also play a large part and require investments at the systemic level to improve outcomes.

The U.S. Government Accountability Office (GAO) issued a report in October 2022 documenting a list of several factors associated with lack of access to maternity care in rural areas including: closure of obstetric services in rural hospitals; counties with a majority of Black or African American residents; and counties with lower income, fewer specialized health care providers, and difficulties in recruiting providers to rural areas. Adding to the complexity of the problem, Medicaid reimbursement rates are also considered inadequate for compensating for the higher costs associated with rural maternity care.

Postpartum Considerations. Considering that more than half (52%) of maternal deaths occur in the first year after birth, it is essential that women continue to receive coordinated, follow-up care during this critical phase. Attendance rates for postpartum visits with maternal healthcare providers are low, especially in vulnerable populations that are low income, uninsured, minorities, socially isolated, and residents of rural areas.

Mental health conditions are leading factors that contribute to maternal mortality and morbidity. Suicide and overdose are often implicated in pregnancy-associated deaths which can occur up to 12 months after delivery of the infant. Opioid use and intimate partner violence, experienced by pregnant women living in rural areas and resulting in adverse pregnancy outcomes, are critically important areas to address. The Texas Maternal Mortality and Morbidity Review Committee has identified community-level factors, such as lack of family/friend/support system, as one of the top contributing factors of underlying cause of pregnancy-related death. Lack of social support and isolation can be especially pronounced in rural areas where pregnant individuals may face social isolation or stigma related to mental health or substance use. Successful community approaches to addressing health disparities in rural areas require the formation of unique shared partnerships and leadership, along with continuous bi-directional community engagement. This requires a community of informed stakeholders to establish area health coalitions that can forge critical links for healthcare delivery.

**ORAL HEALTH**

**Rural/Urban Disparities.** Disparities in oral health access, utilization, and health outcomes exist in U.S. rural communities. The 2000-2016 data from the Medical Expenditure Panel Survey revealed that while rural adult residents were more likely than urban residents to receive restorative and oral surgery services, they were less likely to receive diagnostic and preventive services (AOR= 1.11; 95% CI: 1.02 to 1.21) and diagnostic services (AOR= 0.82; 95% CI: 0.72 to 0.93), similar findings were also reported for children. On the national level, according to the data from the 2017 to 2018 National Survey of Children’s Health (NSCH), rural children were less likely to have a preventive dental visit than urban children (84.9% versus 87.5%, P = 0.03), less likely to have received fluoride treatment (46.6 percent versus 52.5 percent, P = 0.0022), and less likely to have received a dental sealant (19.5% versus 22.5%, P = 0.0147). Despite an increase in preventive dental services and a decrease in surgical procedures, significant disparities in oral health care exist between rural and urban residents in the U.S.

**Disparity by Region.** Access to dental care and, as a result, oral health outcomes vary by region. According to the literature, disadvantaged areas, such as Appalachia and the Mississippi Delta, have significant and persistent disparities in tooth loss. Across the four census regions of the U.S., rural residents in the South were the least likely to visit a dentist. Many of these regional disparities observed can be attributed to rapidly aging populations, lower fluoride levels in drinking water, and lower socioeconomic status. In a study to estimate supply and demand of preventive dental care for children in Georgia, and identify dental care shortage areas, more pediatric dental care shortage areas were found in rural than urban Georgia (60% versus 39%).

**Variation by Race/Ethnicity.** Oral health disparities among subpopulations are worsened by rurality.
People of color who live in rural areas, such as Black adults and children, face more barriers to accessing dental care and retaining their teeth than those who live in suburban or urban areas. Rural Black adults were also less likely than urban Black adults to have received a preventive procedure (AOR=0.55, 95% CI: 0.35-0.87). In addition, only 34% of rural Blacks had a dental visit, compared to 62% of Whites, and 28% of rural Blacks experienced tooth loss, compared to 17.5% of Whites. Other factors that influenced the likelihood of receiving preventive or treatment procedures were race/ethnicity, socioeconomic status, and dental insurance (P=0.01 and P=0.05, respectively).

Impact on Morbidity and Mortality. Routine dental care enables early detection of oral diseases and delivery of preventive care which may help to avoid more extensive dental treatment. Caries, periodontal disease, and tooth loss are associated with adverse health outcomes like pain, decreased chewing, lower self-esteem, negative social perceptions, and reduced quality of life and overall health. Dental providers recommend routine preventive dental care to maintain optimal oral health and avoid these negative outcomes. A study found that prior year preventive dental visits are associated with fewer subsequent treatment dental visits and lower dental expenditures among Medicaid-enrolled adults. Routine dental care and regular screening can reduce the burden of the most common forms of oral health mortality in which nearly 30,000 annual cases of oral and pharyngeal cancers are detected, approximately 7,500 of which result in death.

Oral health is now well understood to be a foundational and fundamental component of overall good general health. Impaired oral health may cause many problems and negatively affect quality of life. Systematic literature reviews have shown that both tooth loss and periodontal diseases negatively impact the quality of life. Atherosclerotic disease, pulmonary disease, diabetes, pregnancy, birth weight, osteoporosis, and kidney disease are among the systemic conditions impacted by oral conditions. Complications from these conditions cause significant morbidity and mortality and are extremely costly to the healthcare system. Unfortunately, a lack of access to primary medical or dental care prevents some patients from receiving routine/regular care until an adverse outcome occurs. One study found an association between preventive dental visits and improved healthcare outcomes and cost savings among patients with diabetes mellitus, implying an overall health benefit associated with preventive dental care for people with diabetes. Barriers and Causes of Rural-Urban Disparities. The National Advisory Committee on Rural Health and Human Services, 2018, reported that among the existing barriers to oral health care were: inadequate number of dentists who accept Medicaid and the Children’s Health Insurance Program or who have discounted fee schedules, insufficient or lack of dental insurance benefits, lack of transportation, insufficient levels or lack of access to water fluoridation, lack of awareness and education about oral health, geographic barriers to care, poverty, cultural barriers, and stigma. Oral health professionals are frequently scarce in rural communities. According to HRSA, 4,633 of the 6,927 Dental Health Professional Shortage Areas (HPSAs) in the U.S. were in rural or partially rural areas as of March 31, 2022 (Figure 2). More than 60 million Americans (18%) reside in rural areas; of these, 34 million live in a dental health provider shortage area. This deficiency negatively impacts access to preventive dental care and exacerbates the disparities in rural areas. In rural areas with a dental health providers shortage, a higher proportion of tooth extraction and a lower proportion of dental visits or teeth cleaning were found. Most dental school graduates, even those who were raised in rural areas, choose to work in more urban settings. Therefore, rural communities have fewer dentists and require longer travel times to reach dental care. Moreover, residents of rural areas have higher unemployment and poverty rates. They also have lower rates of insurance coverage and Medicaid eligibility. According to a 2021 report from the American Dental Association’s Health Policy Institute, Medicaid reimbursed only 61.4% of the private insurance reimbursement rate on average for children and 53.3% for adults in 2020. A 2021 study in the Journal of Rural Health found that rural residents are 20% less likely to have
Preventive Care For Rural Populations And Providers

Dental insurance than those in urban areas or areas adjacent to urban-populated areas. Adding to that, cultural beliefs, dental anxiety and lower levels of oral health literacy, also may contribute to rural-urban disparities in access to preventive dental care.

Rural populations have less access to the preventive benefits of fluoridated water. This might be attributed to the fact that it is proportionally more expensive to fluoridate small community water supplies than large ones. However, every $1 spent on fluoridation saves $38 in treatment costs in a community with a population of 20,000+. For communities with fewer than 5,000 people, the ratio is $6 saved to every $1 spent. In addition, most of the 12.6% of U.S. residents using private wells are located in rural areas. These wells are typically unfluoridated.

**Proven Solutions or Interventions.** Opportunities to decrease oral health disparities in preventive dental care among rural populations have emerged and have been prioritized by different national agencies and institutions. Several of these interventions, or potential solutions, are described below.

**Oral Health Integration into Primary Care.** Because primary care providers generally have more regular contact with underserved populations, integrating oral health care into a primary care setting may contribute to better oral health outcomes. General practitioners and pediatricians can act as initial screeners and points of access and provide referrals for oral health screenings and prevention services. In most states, primary care for children is more prevalent than pediatric dentistry or hygiene. In the primary care-oral health integrated care model, families receive preventive oral healthcare services and important prophylaxis screening within the primary care setting.

**Teledentistry.** For preventive oral care, teledentistry could be as effective as in-person screening and examinations, particularly in school-based programs, remote areas with poor

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Figure 2. Health Professional Shortage Areas Dental Health

Note: Alaska and Hawaii not to scale. HRSA scores HPSAs on a scale of a whole number (0-26 for dental health), with higher scores indicating greater need.

Source(s): data.HRSA.gov, U.S. Department of Health and Human Services, November 2022.
access to care, long-term care facilities, and rural areas. It is a feasible and legitimate tool to identify oral diseases, refer patients, and conduct teleconsultations. Evidence shows that teledentistry improved cost effectiveness, accuracy and efficient remote assistance for clinicians.

**Workforce.** Opportunities to improve access through workforce measures, thereby strengthening the safety net for dental care in rural areas, are being investigated and developed as they relate to the scope of practice and the oral health workforce. One model is the use of expanded duty auxiliary dental personnel such as certified dental hygienists to give care in a range of public health settings without the supervision or consent of a dentist. Another promising model is the adoption of dental therapy in the U.S. to address persistent issues with the rural dental workforce which is one of the biggest innovations with potential to impact rural residents. Dental therapists offer preventive and restorative dental care as part of a dental team. According to Chi and colleagues’ 2018 evaluation of the Alaska program, villages with therapists had improved access to dental care and prevention services, fewer extractions, and needed less general anesthesia for treatment.

**Training Rural Practitioners.** Programs intended to recruit and train rural dentists also have the potential to create major improvements in rural access. This includes programs developed by dental schools, and the National Health Service Corps (NHSC) scholarship and loan repayment programs. National rural primary care training programs such as the HRSA-funded academic unit, Rural Primary Care Research, Education, and Practice may also serve as potential models for rural oral health expansion.

**Education and Community Outreach Programs.** Other oral health interventions to reduce preventive oral health disparities in rural areas are community outreach programs delivered in a variety of settings and incorporating a variety of oral healthcare services in the community (e.g., oral health education, interprofessional care, school-based sealants program, and delivering care through mobile dental vehicles). A study found that community-based oral health promotion interventions that combine oral health education with supervised toothbrushing or professional preventive oral care can reduce dental caries in children in rural areas. Another effective strategy to supplement traditional oral health care in rural areas is use of mobile dental vehicles (MDV) since traditional strategies such as the construction of dental clinics or hospitals, are neither practical nor cost-effective in very rural settings. The MDVs have usually been utilized in school-based oral health programs providing screening and other preventive dental care such as oral health education, fluoride varnish, and sealants.

**SUMMARY AND CONCLUSIONS**

Solutions to improve preventive healthcare services in rural areas include: (1) expanding Medicaid in states that have not adopted that provision of the ACA; (2) removing physician oversight requirements for nurse practitioners in the 23 remaining states that continue to place this financial burden and restriction on nurse practitioners; (3) utilizing school-based primary care clinics; (4) educating rural residents on the importance of and need for USPSTF-recommended screenings; and (5) providing continuing education for rural providers on updates in preventive guidelines. More than ever, rural health policymakers need to be monitoring potential gaps in access to health care, as well as providing support for social determinants of health, with the goal of improving access to routine health screenings for rural residents. By increasing access to regular preventive care, we can significantly improve the health of rural communities in America.

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    Chapter 3. Rural Healthcare Access and Quality
    Chapter 7. Rural Healthy People; Older Adults
    Chapter 12. Disparities and Opportunities Across the Cancer Continuum in Rural America
    Chapter 15. An Examination of the Workforce in Rural America
    Chapter 18. Rural Health Issues in Child and Adolescent Development

Suggested Chapter Citation:
THE IMPACT OF DIABETES ON RURAL AMERICANS

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SCOPE OF THE PROBLEM

• Diabetes ranks as the 8th leading cause of death in the United States, with nearly 103,000 diabetes-related deaths per year.1

• Diabetes has a disproportionate impact on rural Americans with geographic variability noted in incidence, prevalence, and mortality. Over the last decade, rates did not improve overall in the rural U.S. and, in fact, increased in the rural South.2,4

• The Healthy People 2020 nationwide goals for diabetes were achieved or surpassed for objectives pertaining to diabetes prevention, diagnosis, and glucose monitoring.5

• Since 2009, rural rates of minor lower extremity amputations (LEA) increased across both rural and urban populations, as well as racial/ethnic categories and census regions.6 Likewise, overall risk of a major LEA increased with rurality and was also higher among residents of the South than among those of the Northeast. A steep decline in major-to-minor amputation ratios was observed, especially among Native Americans.6

• Diabetes is an ambulatory care sensitive condition. Caring for persons with diabetes is challenging for healthcare providers because they have limited time with patients and diabetes self-management may not be an insurance benefit or a priority for the patient.7,8

Rural disparities and challenges include:

• Lack of access to medications, supplies, and regular primary care is the number one contributor to diabetes health disparities, poorer health outcomes, and higher mortality rates.6,9-17

• Rural-dwelling persons are more likely to report a diagnosis of diabetes than urban adults, 12.6% versus 9.9%.18

• People with diabetes who live in rural areas have significantly higher morbidity from diabetes-related complications compared to those living in more urban areas.19

• Limited access to health care and resources for diabetes self-management exist in rural areas.11,18,20

• Individuals in rural areas have a 12.4% higher diabetes mortality rate than those residing in urban areas, particularly in the southern U.S.21,22

The United States population continues to reflect life-style factors and social determinants of health associated with obesity, metabolic syndrome, and diabetes.23 Although diabetes prevention and care has been improving,3 disparities still exist between rural and urban areas of the U.S. Persistent disparities observed among rural populations show that they experience more negative health consequences related to diabetes.1,24 Limited access to health care and resources for diabetes self-management persist in rural areas, and there are large degrees of variation in disease burden among racial and ethnic groups.6,9-17

RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

Every ten years, the U.S. Department of Health and Human Services identifies collective goals to
improve the health and well-being of Americans through an initiative called Healthy People. Among its current priorities, Healthy People 2030 states that its overall goal for diabetes is to "reduce the burden for those lacking access to care and medications as well as improve quality of life for all people who have, or are at risk for, diabetes." Healthy People 2030 objectives related to diabetes call for reducing the consequences of diabetes – namely amputations, Alc values >9.0, vision loss, emergency department visits for insulin overdose, diabetes-related hospital admissions, and deaths due to diabetes. The objectives also call for an increase in diabetes education and daily blood sugar monitoring, yearly eye exams for adults with diabetes, and yearly urinary albumin testing to determine liver function in those with diabetes.

This literature review addresses diabetes as an identified priority for rural America. Some of the specific objectives of the Healthy People 2030 diabetes goal that will be addressed include:

- D-01 Reduce the number of diabetes cases diagnosed yearly.
- D-03 Reduce the proportion of adults with diabetes who have an Alc value above 9%.
- D-06 Increase the proportion of people with diabetes who receive formal diabetes education.
- D-07 Increase the proportion of adults with diabetes using insulin who monitor their blood sugar daily.
- D-08 Reduce rates of foot and leg amputations in adults with diabetes.
- D-09 Reduce the rate of diabetes-associated mortality from any cause in adults with diabetes.

RURAL HEALTHY PEOPLE 2030 SURVEY

Selecting from the 62 Healthy People 2030 leading health indicators, a total of 1,291 rural stakeholders responded to a nationally disseminated web-based survey to determine the 20 most important health priorities for rural Americans. A total of 32.2% of respondents to the Rural Healthy People 2030 survey identified diabetes as one of their top 10 health-related priorities; nearly 10% (i.e., 9.2%) of those surveyed identified diabetes as one of their top three priorities. This ranked diabetes as the 9th most important national rural health priority overall. Other types of health conditions found in the top 20 rankings were mental health, addiction, cancer, overweight/obesity, and chronic pain. When comparing responses by U.S. census regions, diabetes was ranked highest by respondents living in the South. The survey also reported that diabetes "was selected as a ‘top 10’ priority more frequently by respondents residing in states which had not expanded Medicaid (rank=6) than those who resided in states that did (rank=11)."

KNOWN RISK FACTORS FOR THE CONDITION

Factors known to be associated with the risk of developing diabetes include being overweight or obese, lack of physical activity, poor diet, and lack of access to healthy foods with reduced calories. Lack of access to medical care, preventive care, medications, and monitoring are associated with higher rates of the condition going undetected, as is living in the southern and midwestern regions of the U.S.

According to the Centers for Disease Control and Prevention, people are at risk for type 2 diabetes (T2DM) if they:

- Have prediabetes defined as persistent mildly elevated blood sugar.
- Are overweight or obese, with a body mass index of 25 and above.
- Are 45 years or older.
- Have a first-degree relative, including parent, brother, or sister with T2DM.
- Engage in physical activity fewer than three times a week.
- Have a history of gestational diabetes (i.e., diabetes during pregnancy) or have given birth to a baby weighing over 9 pounds.
- Are an African American, Hispanic or Latino, American Indian, Alaskan Native, Pacific Islander, or Asian American.
- Have non-alcoholic fatty liver disease.

PREVALENCE AND DISPARITIES IN RURAL AREAS

Disparities surrounding diabetes also reflect that rural Americans have a higher prevalence of
In 2016, within nonmetropolitan counties, 12.6% of the population had diagnosed diabetes, while in metropolitan areas 9.9% of the population had diabetes. Furthermore, rural-urban disparities exist for diabetes-related mortality. In rural America from 1999 to 2015, individuals residing in noncore areas (the most rural classification) had a 12.4% higher mortality rate compared to those residing in large central metropolitan areas. Additionally, notable differences have been reported for rates of persons who die while hospitalized due to diabetes-related co-morbidities, with urban hospitals reporting deaths associated with diabetes at 2.63%, while rural hospitals reported diabetes-related deaths at 10% higher. With regard to overall mortality, rural America also lags behind. By 2016, urban counties reported a 27% decline in mortality rates per 100,000 people (from 29 to 21 points), while rural or noncore areas reported only a 3% decline (from 29.3 to 28.6 points).

**VARIATION BY RURAL REGIONS**

Diabetes mortality and morbidity also differ across census and geographic regions in the U.S., further adding to observed differences between rural and urban areas. Figure 1 shows an increased percentage of diagnosed diabetes rates over time, especially in the South and Midwest regions. Within the rural South, diabetes-related deaths were 7.5% higher compared to large metropolitan areas within the same region. Like the South, the Midwest region experienced greater likelihood of diabetes-related death in rural counties than non-rural counties. The odds of death were 25% higher in both micropolitan (OR 1.23, 95% C.I. 1.18, 1.28) and noncore (OR 1.23, 95% C.I. 1.18, 1.28) areas of the Midwest, and they were 25% higher in micropolitan areas (OR 1.25, 95% C.I. 1.21, 1.28) and 29% higher in noncore areas of the South. Along with these geographic disparities, there are disparities in the Appalachian region as well, where 13% of rural residents have been diagnosed with diabetes, while only 10.5% of residents living in metropolitan areas of Appalachia have been diagnosed. Furthermore, the Appalachian region has a 1.4% increased burden of diabetes compared to their non-Appalachian state counterparts.

**VARIATION BY RACE AND ETHNICITY**

Diabetes prevalence and adverse health outcomes have striking racial and ethnic disparities in adults and children living in rural areas. In the general population of adults aged 18 years and older, the likelihood of diabetes is higher among American Indians or Alaskan Natives (14.5%), non-Hispanic Blacks (12.1%), Hispanics (11.8%), and non-Hispanic Asians (9.5%) when compared to non-Hispanic Whites (7.4%). In rural areas, historical minority individuals experience even more health disparities with regard to diabetes care and health outcomes, as well as higher mortality rates. These disparities have contributed to pronounced variation of health equity outcomes between urban and rural populations. For example, rural individuals are three times more likely to die from diabetes when compared to those living in rural counties.
However, there is a distinct need for future studies that focus on racial disparities among populations in rural areas. There is also an acute lack of research focusing on rural populations among Asian/Pacific Islanders, American Indians, and Alaskan Natives.

Rural non-White populations on average are diagnosed at younger ages with diabetes than their geographically similar White counterparts for both type 1 and type 2 diabetes.\(^9\) Racial disparities in patients with diabetes living in rural areas also manifests in higher diabetes hospitalization rates and prevalence of diabetes-related complications. For example, African Americans in rural areas are reported to have a higher hospitalization rate and are more likely to have a higher percentage of uncontrolled A1c levels when compared to non-Hispanic Whites.\(^14,16\) Although diabetes-related mortality rates have significantly decreased among African Americans who live in urban areas, the same improvements have not been seen in rural areas.\(^9\) Among other historical minority groups in rural areas, Native Americans and Hispanics had a higher incidence of minor or major lower extremity amputations.\(^6\) Also, Asians or Pacific Islanders in rural areas are more likely to die during a diabetes-related hospitalization.\(^17\) These disparities are likely the result of a complex interplay of factors, including poverty, access to healthcare, health insurance coverage, access to healthy food options, and limited physical activity opportunities.\(^33-36\) This mix of factors can contribute to higher rates of diabetes among minority populations.

**IMPACT ON MORTALITY AND MORBIDITY**

Diabetes is ranked as the 8th leading cause of death in the U.S with nearly 103,000 diabetes-related deaths per year.\(^1\) Type 2 diabetes mellitus is often observed in the presence of obesity, metabolic disorders, lipid disorders, and associated vascular inflammation. Other associated chronic conditions, such as renal disease and hypertension, lead to higher risks of mortality due to renal failure and cardiovascular events associated with comorbidities.\(^37\) More recent studies have documented the significantly higher rates of COVID-19 mortality observed in patients who also have a diagnosis of diabetes.\(^38\)

This phenomenon has been observed worldwide, not just in rural areas. Perhaps most disturbing were significantly higher rates of COVID-19 associated mortality for patients admitted during the pandemic, while individuals with poorly controlled HbA1c had a significantly higher risk of severe COVID-19 and significantly higher rates of mortality.\(^39\) In particular, rates of diabetes-associated deaths are generally higher in the southern U.S., with Mississippi and West Virginia, as well as states throughout the Midwest, reporting significantly higher rates of COVID-19 + T2DM-associated mortality.\(^22\) For example, in largely rural southern states like Mississippi, Arkansas, Louisiana, and Oklahoma, age-adjusted death rates associated with T2DM as a primary condition range from 32% to 41%.\(^22\) In general, rates of diabetes-associated deaths are higher in the southern U.S. The three states with the highest reported diabetes mortality rates — West Virginia, Mississippi, and Arkansas — all rank within the top 10 states for highest percentage of residents living in rural areas as defined by the U.S. Census Bureau.

Researchers are now observing that diabetes is a significant contributor to cancer mortality and morbidity, adding to the complexities and challenges of rural cancer prevention and treatment.\(^40\) Inflammation, long known to be a contributor to cancer risk, is now being investigated as a connecting link between diabetes and cancer. Cancer risk is increased in persons with diabetes mellitus. There is a 10% increase in cancer risk with concurrent diabetes and it is estimated that between 8% and 18% of patients with cancer have diabetes.\(^41,42\) Often, cancer symptom management includes glucocorticoid use which may inhibit cell function causing an increase in fatty acids, thereby increasing insulin sensitivity and inducing diabetes.\(^45\) Targeted cancer therapies may also increase serum glucose levels and growth hormones, increasing hyperglycemia and subsequent insulin resistance.\(^43\) Cancer treatment and therapeutic approaches are also associated with increased complications in individuals with diabetes.\(^44\)

**BARRIERS**

There are a variety of known barriers, associated with the previously noted rural disparities, which
can be characterized at different socioecological levels. At the individual level, rural residents are less knowledgeable about risk factors for diabetes onset and progression, and often see diabetes as inevitable versus a preventable condition. At the interpersonal level, rural residents often have fewer family and friend supports for diabetes management and control. Organizationally, there are fewer stand-alone evidence-based self-management programs in rural communities. Likewise, national statistics reflect persistent and limited access to health care and healthcare providers. Combined primary care and availability of behavioral counseling is especially needed in clinical settings. Rural communities and towns often lack parks, workout facilities, or walking areas. Therefore, rural residents may find it challenging to engage in healthy lifestyle behaviors due to insufficient access to safe places for being physically active or healthier food options. At the public policy level, there are few legislative or policy initiatives to address disparities or the lack of resources for tackling major risk factors such as universal access to health care and the ability to afford insurance, medications, and healthy foods.

PROVEN SOLUTIONS OR INTERVENTIONS

The Association of Diabetes Care & Education Specialists has developed a framework of self-management activities which include healthy coping, healthy eating, being active, taking medication, monitoring, reducing risk, and problem solving. Persons living with diabetes are often encouraged to perform these daily self-management activities to attain healthy blood glucose levels and to minimize or delay the onset of diabetes-related complications and comorbidities. However, there is limited access to health care and resources for diabetes self-management in rural areas compared to urban settings. In addition, cultural and societal factors may play a critical role in diabetes self-management behaviors in rural communities due to traditional illness beliefs and acceptance of diabetes. Given the significant proportions of ethnically diverse populations in rural areas, significant barriers exist in finding culturally congruent healthcare providers.

Diabetes Self-Management Education and Support (DSMES), and the more generic Chronic Disease Self-Management Programs for persons with diabetes, are recommended through public health agencies, professional organizations, and the aging services network. For example, with funding from the Administration for Community Living (ACL), local Area Agencies on Aging are able to disseminate DSMES programs throughout the country to adults 50 years and older, including those in rural counties. The ACL programs emphasize the importance of creating supportive networks to help older adults better manage their diabetes.

In past decades, DSMES classes were limited to hospitals and health facilities where patients and their families participated. However, as patient needs have evolved and technology has developed, interventions are becoming more flexible. Now telehealth, online or through telephone interventions, and community-based practices (CBPR) with clear goal setting such as diet management, physical activities, and blood pressure management, have been shown to be effective in improving diabetes self-management behaviors and A1c levels among rural populations. For rural persons who have immigrated recently, culturally tailored interventions, social support, diabetes education programs that include both patient and family members, and collaborating with lay educators or community health workers have demonstrated positive effects on patients’ activation and diabetes self-management behaviors. Digital storytelling, such as “Stories for Change—Diabetes” which is provided in Spanish and uses CBPR approaches, has been shown to improve rural Latino patients’ confidence, motivation, and behavioral intentions for diabetes self-management.

SUMMARY AND CONCLUSIONS

While modest gains have been made, challenges associated with preventing T2DM or managing it well persist. Key to the prevention of diabetes, as well as appropriate management of diabetes, is an active lifestyle, access to primary health care, community-based approaches for prevention of diabetes, and assistance with appropriate management of diabetes for those people...
with T2DM in rural areas. However, a person’s demographic status, such as rurality, age, sex, and income play a role. Access to health care, including appropriate monitoring supplies, insulin, and nutrition education, as well as access to healthy food resources must be addressed and prioritized by state and national policy makers for diabetes care in rural areas.

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Suggested Chapter Citation:

Related Chapters:
Chapter 4. Obesity and Physical Activity in Rural Settings
Chapter 6. Nutrition and Healthy Eating in Rural America
Chapter 7. Rural Healthy People: Older Adults
Chapter 19. Rural Hospital and Emergency Services
Economic stability affords households an opportunity to access safe housing, nutritious foods, healthcare services, stable schooling, and other necessities to remain productive workers and active community members. However, 37.9 million Americans (11.6%) lived in poverty or below the federal poverty limit (FPL) in 2021. This measure is higher for individuals under 18 years (15.3%), those living in families with female head of household (25.3%), Black and Hispanic individuals (19.5% and 17.1%, respectively), and individuals with no high school diploma (27.2%). Household economic instability has worsened in previous decades affected by periods of significant economic downturn during the Great Recession, COVID-19 pandemic, and subsequent inflation. Families of color, and those with already lower socioeconomic status, have experienced larger increases in economic instability thus widening the instability gap. Shocks to economic stability have had negative effects on economic, educational, and health outcomes of adults and children, including increases in mortality.

One of those shocks, the Great Recession, caused the poverty rate to increase from 12.5% to 15% between 2007 and 2010, while unemployment rates increased from 5% to 10% during the same time period. Foreclosures also rose by 800% between 2007 and 2010. However, the proportion of people living in poverty had been on the decline since the end of the Great Recession, decreasing from 15% to 10% between 2015 and 2019. At the same time, the unemployment rate decreased to its historic low of 3.5% by 2019.

Despite these improvements in economic stability through 2019, the COVID-19 pandemic and subsequent recession caused substantial disruptions to households’ finances. An unprecedented share of adults lost their jobs in 2020 with 14% being laid off. Black and Hispanic individuals, as well as individuals with less than a bachelor’s degree, were more likely to be laid off (20%) compared to White individuals or college graduates (12%). Black and Hispanic people were also more likely to report an income of less than $25,000 in 2020 relative to White individuals (40% vs. 20%). While the unemployment rate returned to its pre-pandemic level by the end of 2022, the number of persons living in poverty is still higher than the pre-pandemic level of 10%.
The dialogue about factors influencing health and health disparities has centered on barriers to quality healthcare access among individuals from certain socioeconomic, ethnic, racial, and geographic characteristics. However, other crucial factors related to economic stability affect health outcomes of American families. Some of these factors include, but are not limited to:

- Availability of financial resources to afford stable housing options
- Availability of financial resources to ensure food security
- Access to educational and job training opportunities
- Quality of education
- Socioeconomic status (residence in low-income neighborhoods)
- Stable career opportunities

In 2022, over 40% (19 million) of renter households were considered housing cost-burdened because they spent more than 30% of their gross income on housing costs. At the same time, approximately 20% of American adults reported household food insecurity, and 25% of adults with children reported food insecurity. Absence of stable housing due to high costs and food insecurity may harm children’s developmental and educational opportunities, as well as preventing adults from maintaining stable employment.

RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

The goal of Healthy People 2030’s economic stability objectives is to “help people earn steady incomes that allow them to meet their health needs.” The U.S. Department of Health and Human Services (DHHS) has noted that individuals with stable employment prospects are less likely to live below the poverty level and are more likely to remain healthy. However, even people with steady work might not make enough money to afford healthcare services due to the high cost of other essentials, such as housing and fuel.

The DHHS focus on economic stability is important for several reasons. First, individuals residing in poverty are less likely to have access to safe housing, nutritious foods, and healthcare services putting them at a higher risk of undertreated preventable diseases. Second, unemployment is associated with adverse health outcomes. As a result, interventions to increase schooling and help people establish successful careers are crucial to improve physical and mental health. Third, when households are forced to spend a large percentage of their income on housing, they may underspend on nutritious foods and healthcare services. Ensuring that households do not spend more than 30% of their income on housing will allow them to improve their health behaviors. Fourth, poverty and limited employment opportunities lead to food insecurity, which is linked with adverse health outcomes in adults and especially children, staving off their developmental and education opportunities.

The Healthy People 2030 objectives that are aimed at addressing economic stability are captured under five main headings: (1) economic stability - general, (2) arthritis, (3) housing and homes, (4) nutrition and healthy eating, and (5) workplace. Because a focus on economic stability was not included in previous iterations of Healthy People, most of the objectives for the current decade serve to capture baseline measures. Some of the specific objectives that will be addressed in this chapter include:

- SDOH-01 Reduce the proportion of people living in poverty
- SDOH-02 Increase employment in working-age people
- SDOH-04 Reduce the proportion of families that spend more than 30% of income on housing
- NWS-01 Reduce household food insecurity and hunger
- AH-09 Reduce the proportion of adolescents and young adults who aren’t in school or working

RURAL HEALTHY PEOPLE 2030 SURVEY

A national survey was conducted from 2021-2022 to determine how rural stakeholders ranked the Healthy People 2030 leading health indicators when considering their importance for rural communities. Overall, rural stakeholders recognized “Economic Stability” as the 10th most important priority for rural Americans. Findings were similar across the Northeast, South, and West U.S. census regions; however, economic
stability ranked relatively high in importance in the Midwest (rank=6) and in states that have not expanded Medicaid (rank=9). Economic stability was also ranked higher by male rural stakeholders (rank=8), respondents ages 18-34 (rank=7), respondents who identified as White (rank=8), and respondents employed in both the Government and Public Administration sector (rank=7), as well as Human Services sector (rank=6). Finally, among rural stakeholders working in health-related fields, those based in Federally Qualified Health Centers (FQHCs) identified economic stability as the sixth most important health issue.22

PREVALENCE AND DISPARITIES IN RURAL AREAS

Unemployment Disparities

The COVID-19 pandemic caused the most significant disruption to household finances since the Great Recession. At the start of the pandemic, the U.S. unemployment rate surged to levels not seen since the Great Depression of the 1930s. The unemployment rate rose rapidly in both urban and rural areas, reaching its peak in April 2020. At its highest, the unemployment rate reached 15% in metropolitan areas and 14% in nonmetropolitan areas. Impacted by the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the unemployment rate declined to 5% in nonmetropolitan areas and 6% in metropolitan areas by the fourth quarter of 2020 (Figure 1).23

While the unemployment rate in rural areas returned to its pre-pandemic levels, the overall employment rate remained 2.6% below its pre-pandemic levels due to declines in labor force participation – a trend which is harder to reverse.23 Overall, only 57.8% of adults in rural areas and 41.2% of adults in urban areas were able to work with no COVID-19 related disruptions compared to pre-pandemic times. In the first year of the pandemic, urban workers were more likely to be unpaid for missed hours and be unable to work or look for work due to several factors including the pandemic’s initial peak in major urban areas and more aggressive COVID-19-related counter measures, such as social distancing and stay-at-home orders. However, rural workers had fewer opportunities to work remotely in part due to less prevalent home internet access. These disparities between urban and rural areas can be attributed to differences

Figure 1. U.S. Unemployment Rates in Metropolitan and Nonmetropolitan Areas, 2019-2021

Source: USDA Economic Research Service using data from the U.S. Census Bureau, American Community Survey.
in socioeconomic composition and state-level policies suggesting the need to avoid one-size-fits-all recovery policies.\textsuperscript{24}

Other long-term issues affecting rural labor force participation include a decline in population growth and an increase in average age in rural areas. In the past decade, the rural working-age population declined by 4.9%, while the population over 65 years old grew by 22%. Outmigration of younger adults to metropolitan areas and in-migration of older adults to nonmetropolitan areas has helped accelerate population aging in rural communities. A decline in the working-age population may hinder attempts to meet labor demands in some rural industries and regional labor markets and adversely affect tax revenue leading to insufficient resources to fund healthcare services, community centers, and other services for an aging population.\textsuperscript{25}

\textbf{Income Disparities}

Higher incidence of rural poverty relative to urban poverty has existed since the 1960s, with the difference declining over time to the most recent estimate of a 3.1 percentage point gap. Rural poverty reached its 30-year peak of 18.4% in 2013 following the Great Recession, declining to 15.4% in 2019 compared to 11.9% in urban areas.\textsuperscript{26}

The Economic Research Service (ERS) at the United States Department of Agriculture (USDA) highlights persistence over time as an important dimension of poverty. The ERS classifies counties as being in persistent poverty if 20% or more of their populations have lived in poverty over the last 30 years. Using this definition, the ERS has determined that there are currently 353 persistently poor counties in the U.S. (comprising 11.2% of all U.S. counties), with 301 of them (85.3%) located in nonmetropolitan areas and accounting for over 15% of all nonmetropolitan counties (Figure 2). Furthermore, approximately 89% of persistently poor counties are located in the U.S. South census region (Figure 3).\textsuperscript{26}

Children in rural areas are more likely to live in poverty than their urban counterparts. Across the U.S., 21.1% of children residing in rural areas were considered poor compared to 16.1% of urban children.

Figure 2. Poverty Rate in Nonmetropolitan Counties, 2015-2019 average\textsuperscript{23}

\begin{figure}[h]
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\includegraphics[width=\textwidth]{poverty_rate_map}
\caption{Poverty Rate in Nonmetropolitan Counties, 2015-2019 average\textsuperscript{23}}
\end{figure}

Source: USDA Economic Research Service using data from the U.S. Census Bureau, American Community Survey.
Rural children are not only more likely to be poor, they are also more likely than urban children to live in both poor households and poor neighborhoods. A decrease in earnings is the most important factor in rising rural poverty rates, an effect that is twice as large for rural versus urban households. Persistently high child poverty is disproportionately concentrated in rural counties that have low labor force participation and high unemployment, low rates of educational attainment, and high proportions of single-mother families and low-wage employment. The ERS has determined that there are 708 persistent child poverty counties in the U.S. (comprising 22.5% of all U.S. counties), with most of them located in southern nonmetropolitan areas.

The high proportion of persistently poor counties located in rural areas creates several long-term issues. Previous research has demonstrated that low-income individuals living in communities where poverty is prevalent face barriers beyond those of their individual financial circumstances. Concentrated poverty contributes to sub-optimal housing and health conditions, higher crime and school dropout rates, and fewer stable employment opportunities. As a result, economic conditions in persistently poor areas create limited opportunities for poor residents to move up in income distribution.

**Housing and Food Access Disparities**

As of 2021, there were approximately 29 million homes in rural America, comprising a quarter of the housing units in the U.S. Rural residents are more likely to own a home (80%) than their urban counterparts (60%), in part, due to cheaper housing options. However, residents of rural counties tend to pay slightly higher interest rates on average and are less satisfied with the conditions of their mortgage, than borrowers in other areas.

The U.S. Department of Housing and Urban Development (HUD) defines households as housing cost-burdened if they spend more than...
30% of gross household income on housing thus making it unaffordable. The HUD estimated that over five million rural households spend more than 30% of their monthly incomes in housing-associated costs, while 2.1 million rural households spend more than 50% of their income on housing costs making them severely cost-burdened. High housing costs can lead to foreclosure or eviction. Both events are traumatic and may lead to further financial losses. Individuals may be forced to move in with friends or relatives resulting in overcrowding or relocate to lower-income neighborhoods with higher crime rates. Multiple moves as a result of unstable housing options have especially severe effects on children leading to poor physical health and a higher likelihood of developing chronic health conditions. At its extreme, the inability to afford housing may lead to homelessness. While rural homelessness is hard to precisely quantify, HUD’s most recent estimates suggest that approximately 14% of all homeless individuals across the U.S. reside in rural areas.

Cost-burdened households have fewer resources to spend on other necessities including nutritious food. According to the most recent USDA estimates, approximately 11% of rural households were considered food insecure (Figure 4). While rural communities make up approximately 63% of all U.S. counties, they make up 87% of counties with the highest food insecurity rates (top decile of counties). Rural communities are more likely to be disproportionately affected by food insecurity due to lower incomes, transportation barriers, and limited access to affordable nutritious foods.

**Educational Disparities**

Over the last half century, rural areas experienced remarkable improvements in educational attainment, increasing high school graduation rates from 40% in the 1960s to 87% in 2019, which is only slightly lower than the 2019 urban high school graduation rate of 89%. At the same time, the proportion of college graduates in rural areas increased from 5% to 21%. However, the rural college graduation rate is still significantly lower than the urban graduation rate, estimated to be 35% in 2019. Overall, disparities in educational attainment between urban and rural areas persist, although the gap has narrowed over

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**Figure 4. Food Insecure Households (%), 2021**

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<thead>
<tr>
<th></th>
<th>Nonmetropolitan</th>
<th>Metropolitan</th>
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<td>2021</td>
<td>10.8%</td>
<td>10.1%</td>
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*Source: USDA Economic Research Service using data from the U.S. Census Bureau, American Community Survey.*
time (Figure 5). Factors contributing to these disparities include lower household incomes in rural areas (which trail those in urban areas by 20-25% and make college less affordable) and longer commuting distances to colleges.\textsuperscript{11}

Rural schools face significant income and racial/ethnic disparities. More than one quarter of U.S. public schools are rural, educating about nine million students. Approximately half of all rural students are eligible for free or reduced-price lunches, and about a quarter of those are students of color. Rural schools and students face significant disparities in resources and learning outcomes. While a quarter of U.S. schools are considered rural, only 17% of state educational funds go to rural districts.\textsuperscript{42} Rural school districts face numerous challenges including declining enrollments, inability to hire and retain qualified teachers, limited broadband access, and transportation difficulties.\textsuperscript{43} All of these challenges limit educational opportunities for rural children including reduced access to STEM subjects (i.e., science, technology, engineering, and mathematics) and advanced and college-level courses.\textsuperscript{42} Meanwhile, rural students are also less likely to continue their post-secondary education leading to disparities in college graduation rates.\textsuperscript{11} Access to post-secondary education has a significant effect on future earnings potential with rural college graduates making on average $21,000 more than the average rural earner.\textsuperscript{41}

\textbf{VARIATION BY RURAL REGIONS}

While there are disparities in economic stability across rural and urban areas, certain rural regions have fared worse than others. During the height of the COVID-19 pandemic, the unemployment rate was highest in the Northeast, northern Midwest, lower Mississippi Delta, and the West.\textsuperscript{21} The poverty rate historically has been the largest in the rural South, reaching 19.7% in 2019 or six percentage points higher than in southern metropolitan areas (Figure 6).\textsuperscript{28} The South census region also has the highest food insecurity rates in the U.S., with 11.4% of households reporting being food insecure in 2021. Of those households, 7.1% report low food security and 4.3% report very low food security.\textsuperscript{40}

There is also a wide geographic variation in educational attainment within the rural U.S. Rural areas with lower educational attainment tend to be clustered in the South. Four out of five counties with at least 20% of adults age 25-64 lacking a high school diploma or equivalent are located in rural areas; 70% of those counties are clustered in the South.\textsuperscript{41} There are substantial differences in student achievement across different rural regions suggesting that disparities in educational opportunities for rural students are more pronounced in some areas. For instance, rural students in New England are scoring a grade level above the

\begin{figure}[h]
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\includegraphics[width=\textwidth]{figure5.png}
\caption{Educational Attainment in Rural and Urban Areas (%), 2000 and 2019}\textsuperscript{41}
\end{figure}

Source: USDA Economic Research Service using data from the U.S. Census Bureau, American Community Survey.
national average, while rural students in the West Coast region are scoring a grade level below the national average.13

**VARIATION BY RACE AND ETHNICITY**

Over the past decade, the rural workforce has become more diverse.26 Employment grew faster for non-White and Hispanic individuals in every type of industry except for agriculture, making all other races as well as non-Hispanic workers a more prominent proportion of the rural workforce.26 Specifically, the non-White workforce grew 56.9% in the transportation industry, 49.2% in professional services, and 30% in construction, finance and insurance, real estate, and administrative services.

However, nonmetropolitan areas continue to have a higher share of White workers relative to metropolitan areas. The ERS estimates that White workers constitute 81% of the workforce in nonmetropolitan areas, but only 60% in metropolitan areas. At the same time, Hispanic workers make up 8.3% of the nonmetropolitan workforce, Black workers make up 7.2%, and Asian and Alaska Native workers make up approximately 1.5% each. These ratios are substantially below those in metropolitan areas where Black workers make up 13% of the labor force and Asian workers make up 7% of the labor force.26 American Indian or Alaska Native workers are the only ones, besides White workers, to make up a smaller proportion of metropolitan workforce than nonmetropolitan workforce, 1.5% and 0.4%, respectively.26

While the unemployment rate in metropolitan areas declined for Whites, Blacks, and Hispanics before 2019, in nonmetropolitan areas it declined only for Whites, increasing for the other two groups.14

According to the USDA, there are vast racial disparities in poverty levels across racial/ethnic groups in rural areas. Black rural residents had the highest incidence of poverty before COVID-19 (31%), followed by American Indian or Alaska Natives (30%) and Hispanics (22%). The 2019 poverty rate for the rural White population was the lowest (13%), with the exception of the Appalachian region where Whites face higher levels of poverty.28,42 Alarming, child poverty rates remained persistently high, especially among African Americans in the rural South and Native Americans in the rural Midwest.28

The USDA also found that White households had the lowest food insecurity level in 2021 (8%). That is significantly lower than the prevalence of food
insecurity among Black households (23%), Hispanic households (18%), and other households (11.5%). Seventy percent of rural counties with low educational attainment are counties where Black and Hispanic individuals comprise at least 20% of the overall population. Less educated rural Hispanics are clustered in the Southwest as well as Midwest.\textsuperscript{41} Rural White and Native American students tend to score at least half a grade lower than their urban counterparts, while the difference in performance between Hispanic rural and urban students is small.\textsuperscript{43} With respect to educational resources, more than 42% of Native American rural students, 36% of Black rural students, and 30% of Hispanic rural students are enrolled in high poverty school districts, compared to 7% of White rural students.\textsuperscript{42}

**IMPACT ON MORTALITY AND MORBIDITY**

Multiple studies have highlighted the relationship between economic stability and health outcomes. Residents of low-income communities have an increased risk of mental illness, chronic diseases, disability, and mortality.\textsuperscript{15-17} They are more likely to deal with obesity, chronic stress, and substance abuse disorders.\textsuperscript{48} Childhood poverty is especially associated with developmental delays and chronic conditions that persist into adulthood.\textsuperscript{19,42} Older adults living in poverty experience higher incidents of disability and mortality, as well as significantly lower life expectancy than their higher income counterparts.\textsuperscript{53,54}

High rates of unemployment also have significant adverse effects on health status with the effects varying by the unemployment duration. While short spells of unemployment are associated with poor access to healthcare services due to loss of health insurance, longer unemployment spells may lead to poor self-reported physical health status including higher rates of obesity, hypertension, high cholesterol, and poor self-reported mental health status such as diagnosed depression and stress.\textsuperscript{55}

Housing instability arising from cost-burdened housing or homelessness is associated with significant adverse physical and mental health outcomes.\textsuperscript{56} Several studies exploring the link between housing instability and health report that households faced with high housing costs relative to income have a higher prevalence of cardiovascular diseases.\textsuperscript{57} Residence in subpar housing conditions may also lead to an array of diseases. Mold and pests can cause asthma, presence of lead can lead to severe developmental deficiencies in children, and poor construction can lead to unintentional injuries, especially in older adults.\textsuperscript{58} Extreme housing instability, such as homelessness, can also lead to substance abuse disorders.\textsuperscript{56}

Food insecurity and lack of access to affordable nutritious foods can also cause an array of chronic conditions including diabetes, obesity, cardiovascular disease, and mental health disorders, such as depression, anxiety, and suicidal ideation, especially among younger adults.\textsuperscript{59,60} Food-insecure children are twice as likely to report fair or poor health and 1.4 times more likely to suffer from asthma, compared to food-secure children. Food-insecure older adults report more limitations in daily activities relative to older food-secure seniors.\textsuperscript{61} Food insecurity also results in significantly higher annual healthcare expenditures.\textsuperscript{62}

Well-resourced rural schools are crucial not only for educational attainment. They play an important role in the health of students and the community. Schools provide essential nutrition to lower income students, promote health initiatives, and serve as points of healthcare access.\textsuperscript{63} Access to physical education and healthy snacks throughout the school day may reduce prevalence of obesity among children.\textsuperscript{64} Insufficient access to counseling and behavioral school-based health services may also contribute to higher prevalence of mental, behavioral, and developmental disorders in rural areas.\textsuperscript{65} Educational attainment itself is a crucial factor driving improvements in health over the past decades.\textsuperscript{63} Less-educated individuals experience significant inequalities in health, including higher prevalence of heart disease, cancer, diabetes, and other chronic conditions as well as mortality relative to their more educated counterparts.\textsuperscript{66,67}

**KNOWN CAUSES OF THE CONDITION/PROBLEM**

Several factors affect long-term economic stability prospects in rural areas. Some of the specific
factors include, but are not limited to:

• Decline in population growth
• Population aging
• Less diversified economy in some rural communities
• Limited access to broadband
• Inferior housing stock
• Lack of reliable transportation

Over the past decade, the rural working-age population has declined by almost 5%, while the population of seniors has grown by over 20%. While COVID-19 led to an increase in net migration into rural areas, adding to the working population, the increase was not enough to offset rapid rural population aging. Declines in the working-age population may make it harder to meet labor demands in rural labor markets, forcing employers to relocate to more suburban areas. In addition, transition of jobs to remote work during the COVID-19 pandemic left behind certain rural communities that did not have reliable high-speed internet.

While the rural economy has become more diversified over the past decades, some rural communities still rely heavily on such industries as farming, mining, and manufacturing. As a result, rural communities are more sensitive to changes in energy or agricultural prices and are less isolated from economic shocks than more economically diversified areas.

Limited access to broadband in rural areas causes several additional challenges for rural populations. First, poor connectivity hurts rural school districts by denying them an opportunity to expand virtual learning and other enrichment opportunities for students – opportunities that can help improve students’ chances of attending college. Second, absence of high-speed internet prevents rural residents from enrolling in online higher education courses, which provide learning opportunities and job training leading to more stable employment. Third, better internet access prevents skilled workers from relocating to more rural communities and engaging in their jobs via telecommunicating. While 90% of all U.S. residents have access to moderate- or high-speed broadband, only 63% of rural residents in persistent poverty counties have moderate- or high-speed broadband available in their area.

Although rural residents receive their share of housing assistance from the federal government, they face unique challenges related to inferior housing stock. Rural residents are more likely to face physical housing issues including inadequate plumbing, heating, or electricity. More than 30% of homes without hot and cold piped water are located in rural communities.

Lack of reliable transportation presents another challenge for rural communities. A combination of limited public transportation and long commuting distances force rural residents to spend a higher percentage of their income on fuel. Long commuting distances also cause rural school districts to spend a significant amount of their resources on transportation. Rural households may also be forced to rely on more expensive, less nutritious foods purchased at local convenience stores if a fully stocked grocery store requires a long drive.

**PROVEN SOLUTIONS OR INTERVENTIONS**

Improvements in the conditions that afford households an opportunity to find stable employment, escape poverty, and access safe housing, nutritious foods, stable schooling, and other necessities require the joint efforts of community leaders, researchers, business enterprises, and policymakers. Given the complex and deep-rooted relationships between economic stability and health status, multiple interventions are needed. To that end, various organizations and levels of government have been implementing programs and strategies aimed at addressing the economic stability of rural Americans.

**ReConnect Program** funded from President Biden’s Bipartisan Infrastructure Law and announced in July of 2022, is a USDA program aimed at making additional investments in affordable high-speed internet in rural communities. It is also expected to lower costs for existing internet service. According to the USDA Rural Development agency, improved broadband access can expand economic opportunities, create jobs, and support infrastructure development such as housing and schools. Increased communications technology would also enable online education and jobs.
training in remote rural areas.31

The Child Tax Credit and the Earned Income Tax Credit (EITC) allow low- to moderate-income households to get a tax break and retain more of their disposable income.72,73 Both are considered to be powerful anti-poverty tools, especially in rural communities, where they have helped to reduce poverty and boost incomes.71 Recent research has shown that expanding both programs to certain households currently excluded from the benefits (i.e. childless adults and adults not raising children in the home) would disproportionately impact rural communities, benefiting 45% of rural children through the Child Tax Credit and 23% of childless adults through EITC.75

The USDA’s Rural Housing Service offers rural communities a variety of programs to improve existing housing facilities or build affordable housing for low- and moderate-income rural Americans.76,77 In 2021, the USDA provided 139,221 loans and grants totaling about $24.2 billion.77 It also provided 291,455 annual units of tenant assistance representing about $1.54 billion.77 Through the USDA’s programs, rural households can buy or build single family homes with no down payment, repair their current homes, or refinance their existing mortgage with better terms.78 The USDA also provides loans and grants to owners of multifamily buildings to subsidize rents for low-income tenants who cannot afford to pay the full rent.79

The Supplemental Nutrition Assistance Program (SNAP) is a federal nutrition program that helps millions of low-income American families afford healthier foods.80 SNAP reduces poverty and food insecurity leading to long-term improvements in health and economic outcomes, especially for low-income children.80 Apart from that, the ERS found that household spending of SNAP benefits disproportionately benefited the rural economy, supporting local jobs and increasing economic output through stimulated consumption.82

SUMMARY AND CONCLUSIONS

Recognition that economic stability has a significant impact on individual health status has become more pronounced over the last decade, especially since the COVID-19 pandemic and its disruption to the household finances of many Americans. While residents of inner cities have historically been affected by economic instability, rural residents have not been exempt from unique challenges accessing safe housing, nutritious foods, healthcare services, stable schooling, and other necessities. In fact, some of the challenges may be more striking in rural communities due to pockets of persistent poverty, limited employment opportunities, food insecurity, aging population, limited housing stock, lack of transportation, and underfunded schools. As recognition of the importance of economic stability continues to strengthen, future research should examine the impact current policy initiatives have not only on the financial health of rural Americans, but also on their physical and mental health. The relationship between rural poverty and health is multifaceted, further complicated by regional disparities in economic stability, concentrated in the U.S. South, and racial disparities concentrated among non-White rural residents. To succeed, policymakers, public health professionals, researchers, businesses, community groups, and other stakeholders should continue to work together to implement interventions directed at addressing disparities in access to employment opportunities, affordable housing, nutritious foods, and schooling in rural communities.

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71. USDA Press. Biden-Harris Administration


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Related Chapters:
Chapter 3. Rural Healthcare Access and Quality
Chapter 6. Nutrition and Healthy Eating in Rural America
Chapter 14. Housing and Homes: Implications for Rural Americans’ Housing Conditions, Mental Health Outcomes, and Overall Well-being
Chapter 16. Rural Education Access and Quality

Suggested Chapter Citation:
TRANSPORTATION IN RURAL AMERICA

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SCOPE OF THE PROBLEM

- About 23% of rural stakeholders who responded to a national survey identified transportation as a top priority for rural America; transportation was ranked as the 11th most important health-related priority.¹

- The fatality rate per 100 vehicle miles traveled (VMT) in rural areas has remained almost twice as high as urban areas. However, the rural fatality rate per 100 million VMT increased by only 1% from 1.83 in 2014 to 1.84 in 2020, while that of urban areas increased by 46% from 0.74 in 2011 to 1.08 in 2020.²

- Rural residents account for 19% of the population in the United States, and 31% of the total vehicle miles traveled, yet four out of every ten motor vehicle crash (MVC) fatalities occurred in rural areas in 2020.²

- Rural crashes are usually more severe, and rural drivers involved in MVC fatalities are more likely to die at the scene of the crash, compared to urban drivers.²

Rural and urban residents rely on transportation to commute to work, access essential services, obtain education and healthcare, attend social and recreational activities, and move goods and products from one location to another. Due to limited public transit options, historically, rural residents have always relied more on private vehicles for transportation. Reports from the United States (U.S.) Census Bureau show that only 0.5% of workers in nonmetropolitan areas used public transit systems to get to work in 2019, compared to 5.6% of workers in metropolitan areas.³ Despite the low utilization, rural public transit is valuable and relied upon particularly by the elderly, disabled persons, veterans, adolescents, and low-income earners.⁴ Rural areas with mass transit systems attract more tourists, new residents, and new businesses, which increases economic activities and employment opportunities. The demand for mass transit systems has grown steadily over the past two decades and is expected to continue to increase as more Americans get older and the need for alternative transportation increases.³ Analysis of the 2001, 2009, and 2017 National Household Travel Surveys showed that the proportion of rural residents commuting to work via public transit systems increased from 0.4% in 2001 to 0.7% in 2019 (Figure 1).

Over the past decade, very little progress has been made toward achieving the objectives of reducing motor vehicle crash (MVC) deaths nationally. Data from the U.S. National Highway Traffic Safety Administration (NHTSA) show that MVC deaths increased by 19.5% between 2011 and 2020. Within this time frame, annual increases in fatalities were observed between 2014 and 2016, followed by a decrease between 2017 and 2019, and a recent increase in 2020. The fatality rate per 100 million vehicle miles traveled (VMT) increased from 1.08 in 2014 to 1.34 in 2020. This fell short of the Healthy People 2020 objective aiming for a reduction to 1.2 deaths per 100 million VMT.⁵ The fatality rate per 100 million VMT is a more accurate measure of traffic safety that considers the amount of driving in a particular area. Nonetheless, both the fatality rate per 100 million VMT and the fatality rate per 100,000 population are useful measures of road safety.

Even though there has been a nationwide increase in MVC deaths, comparison of data from rural and urban MVCs show that rural traffic fatalities
Figure 1. Percentage of Work Trips Made by Public Transit

<table>
<thead>
<tr>
<th>Year</th>
<th>Rural Trips</th>
<th>Urban Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>0.4</td>
<td>5.6</td>
</tr>
<tr>
<td>2009</td>
<td>0.6</td>
<td>4.7</td>
</tr>
<tr>
<td>2017</td>
<td>0.7</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Source: Authors’ Analysis of the 2001, 2009, and 2017 National Household Travel Surveys

Rural areas have seen reductions in MVC deaths involving drunk drivers. The proportion of MVC deaths involving a drunk driver decreased by 7% between 2011 and 2020, while that of urban areas increased by 46%. However, a significant uptick was observed for both urban and rural dwellers in 2020, which was attributed to increased drinking during the pandemic. For seat belt use, data from the 2020 National Occupant Protection Use Survey (NOPUS) showed that seat belt use was slightly lower in rural areas (89.9%) compared to urban areas (90.5%). Even though there has been an increasing trend in seat belt use in both urban and rural areas, both fell below the Healthy People 2020 objective of increasing seat belt use to 92%. In 2020, 52% of persons in passenger vehicle occupant deaths in rural areas were unrestrained, compared to 49% in urban areas. Even though there are no reliable methods to determine the precise number of crashes from drowsy driving, it is estimated that 1.6% of total MVC fatalities in 2020 can be attributed to drowsy driving, which is equivalent to 663 deaths.

HEALTHY PEOPLE 2030 OBJECTIVES

The overarching goal of Healthy People 2030 is to “attain healthy, thriving lives and well-being free of preventable disease, disability, injury, and premature death.” One of the leading health indicators, the goal for transportation in Healthy People 2030 is to “promote safe and active transportation.” Access to public transit systems is important because it increases opportunities for physical activity (e.g., walking or biking to bus stops), reduces the rates of air pollution from private vehicles, and reduces the risk of injury and death from MVCs. Overall, it reduces health inequities, which have direct impacts on morbidity and mortality. Healthy People 2030 has seven core objectives related to five transportation areas: transportation in general, physical activities, MVC deaths due to drug and alcohol use, lack of restraints, and drowsy driving. Progress towards five of these objectives will be discussed in this chapter.
1. Transportation – General
   • Increase trips to work made by mass transit – EH-02

2. Drug and alcohol use
   • Reduce the proportion of motor vehicle crash deaths that involve a drunk driver – SU-11

3. Injury prevention
   • Reduce deaths from motor vehicle crashes – IVP-06
   • Reduce the proportion of deaths of car passengers who weren’t buckled in – IVP-07

4. Physical activity
   • Increase the proportion of adults who walk or bike to get places – PA-10
   • Increase the proportion of adolescents who walk or bike to get places – PA-II

5. Sleep
   • Reduce the rate of motor vehicle crashes due to drowsy driving – SH-01

RURAL HEALTHY PEOPLE 2030 SURVEY

The importance of transportation to rural America was reflected in the nationwide Rural Healthy People (RHP) 2030 Survey.1 About 23% of rural stakeholders who responded to the survey identified transportation as a top priority for rural America. When responses to the question of priority objectives were collated, transportation was ranked as the 11th priority for rural America. Almost half (45.6%) of the survey participants selected drug and alcohol abuse as their top priority for rural America, resulting in a ranking of fifth as the most frequently cited health priority. Compared by U.S. census region, transportation ranked relatively high in the Northeast (7th) and Midwest (9th); less so, in the South (12th) and West (17th). There was little difference in the ranking of transportation when comparing age groups, gender, and states that had / had not expanded Medicaid. Of note, those survey respondents that worked in education ranked transportation the lowest (16th), compared to those working in healthcare (11th), human services (7th), and government or public administration (also 7th).9

PREVALENCE AND DISPARITIES IN RURAL AREAS

Trips to Work Made by Mass Transit

The rural-urban disparities in the proportion of trips to work via public transit may be attributed to factors intrinsic to rural communities. These include a geographic landscape which may not facilitate transportation, dispersed and isolated small communities, and low population density.10 There are also policy-related factors such as underdeveloped transportation infrastructure, fewer fixed routes for transit, and inadequate funding for transportation services. These factors increase the home-to-work travel burden. For the same reasons cited above, rural residents have not realized the gains of ride-hailing services such as Uber or Lyft that have eased the transportation burden in urban areas. The rural home-to-work distance is greater than in urban areas, which may result in longer wait times for riders and higher fares for longer trips. The high cost of ride-hailing services may be more prohibitive for low-income earners. Analysis from the Pew Research Center showed that, in 2019, almost half of workers who used public transit systems earned less than $25,000 annually.11 Where public transit systems are available, services may be limited on evenings and weekends, which may restrict mobility for low-income workers with non-typical work schedules.12 Black and Hispanic people, particularly those of low socioeconomic status, are more likely to use public transportation.11 Low-income earners are more likely to live far away from work so that they can live in affordable housing.11 In contrast, people with higher incomes may find it easier to purchase private vehicles, thus shortening their commute to work and increasing their access to a wider variety of economic opportunities.

Motor Vehicle Crashes

Fatalities from MVC occur disproportionately on rural roads. Rural residents account for 19% of the U.S. population and 31% of the total VMT, yet four out of every ten MVC fatalities occurred in rural areas in 2020, according to the NHTSA.2 The rural fatality rate per 100 million VMT has remained almost double that of urban areas over the past 10 years. In year 2020, the fatality rate
per 100 million VMT was 1.84 in rural areas, and 1.08 in urban areas. In the same year, 15,033 (42%) fatal crashes occurred in rural areas, resulting in 16,665 (43%) traffic fatalities. See Figure 2.

In terms of crash characteristics, time of day, location, and driver’s age play a role in rural MVCs. Fatal rural crashes are more likely to occur during the day and be characterized as roadway departure crashes (56%) compared to urban crash fatalities (43%). Roadway crashes are defined by the Federal Highway Administration as “a crash in which a vehicle crosses an edge line, a centerline, or leaves the traveled way.” In contrast, urban MVC fatalities (70%) are more likely to occur at intersections, while only 28% of rural traffic fatalities occur in such areas. With regard to age, rural drivers aged 15-20 and 45-84 had higher MVC fatalities compared to their urban counterparts in year 2020. However, the highest number of fatalities were seen among drivers aged 25-34 in both urban and rural areas. A national study of U.S. counties reported that rural counties with low population density, and males between the ages of 15-34, accounted for the highest number of cases of crash mortality. Other research has also shown that rural traffic fatalities are higher in counties with a high proportion of younger or older adults.

Rural crashes are usually more severe, and rural drivers involved in MVC fatalities are more likely to die at the scene of the crash compared to urban drivers. Among drivers who are transported to hospitals, rural drivers were also more likely to die enroute, compared to urban drivers. Fatal crashes in rural areas are slightly less likely to be speed related compared to that of urban areas. In 2020, data from the NHTSA show that 28% of rural traffic fatalities were speed related, compared to 30% in urban areas. However, an important distinction to note is that in 2020, a majority (71%) of the rural traffic fatalities occurred on high-speed roads, where the posted speed limit was 55 mph or greater, while 65% of those in urban areas occurred in low-speed roads with posted speed limits of 50 mph or less. It has also been reported that states with higher maximum speed limits have more traffic fatalities attributable to speeding on their rural roads.

Severe MVC fatalities occur in rural areas due to high traveling speed, prolonged emergency response time, and longer distances to medical care. Other factors contributing to the severity of crashes include inappropriate gap selection (a driver’s estimation of the space needed from other motorists to complete a maneuver safely) at rural stop-controlled intersections, failure to yield (which may be related to the driver’s age, particularly for young drivers), vision obstruction, and inattention/distraction. Further, the high prevalence of risk factors such as adolescent and adult smoking, alcohol consumption, obesity, physical inactivity, and issues such as serious mental illness, unintentional injury, and suicide directly or indirectly impact rural road safety. It is also important to note that a disproportionate amount

![Figure 2. Fatality Rates per 100 Million VMT, by Land Use, 2011-2020](image-url)
of distracted driving occurs on rural roads, where situational awareness may be lower due to low traffic congestion.22

Unlike urban roads, rural roads lack safety barriers and are characterized by a large presence of heavy-duty vehicles, caravans, and agricultural vehicles.23 Rural roads have poor surface quality and are unlikely to be sealed with tar, bitumen, or concrete despite the presence of large vehicular movement.23 In the U.S., a majority of the rural roads have two lanes which increases the risk of MVC due to the lack of passing lanes, narrow lanes and shoulders, lack of barriers, and limited visibility.24 Other road quality issues include unsignalized intersections, which account for 30% of rural area crashes.25 Reports from the American Association of State Highway and Transportation Officials show that 42% of lane departure crashes happened at horizontal curves, of which half were in rural areas.26

Vehicles play a major role in rural traffic fatalities and are critical to the severity of injuries sustained. Rural residents generally drive older vehicles, which may lack safety features such as airbags to reduce the risk of head and neck injuries and prevent ejection from the vehicle during a crash.27 Vehicle types such as all-terrain vehicles (ATVs), motorcycles, and farm vehicles are more commonly used in rural areas and consequently, there are more crashes involving these vehicle types in rural areas. Crashes involving farm vehicles contribute to occupational injury and mortality and are a major threat to other road users, especially when the crashes involve passenger vehicles.28,29 Crashes involving ATVs are more likely to occur in isolated rural areas which have large terrains that are conducive to driving ATVs. Drivers of such vehicles are less likely to wear helmets at the time of the crash than those who drive regular vehicles, resulting in head injuries. Children are at particular risk of being involved in crashes involving ATVs, and a report from the Consumer Product Safety Commission shows that every hour, four children are seen in emergency departments with ATV-related crash injuries. Notably, there are more casualties related to ATV crashes than bicycle crashes. Between 1982 and 2016, children under age 16 accounted for 22% of all ATV-related fatalities.30

The prevalence of motorcycle usage has grown exponentially in the past decade, as have motorcyclist fatalities. Loss of control on turns is responsible for 50% of powered two-wheel crashes.32 Although motorcycles make up approximately 3% of all registered motor vehicles in the U.S., and travel only 4% of miles, they account for approximately 10% of all MVC deaths. Motorcycle accidents are more than 37 times more severe than automobiles crashes. Motorcycle crashes are also more likely to involve alcohol, especially in rural areas. In 2019, 32% of fatal motorcycle crashes involved alcohol impairment, compared to 26% of urban motorcycle crashes.35

**Motor Vehicle Crashes Related to Drug and Alcohol Use**

Over 10,000 lives are lost each year to alcohol-impaired driving, but more lives are lost in rural areas. In the year 2020, one in five fatal crashes involving driver alcohol impairment and, of these, 42% were rural while 57% were urban. When VMT is considered, the risk of alcohol-related MVC is three times higher in rural than urban areas.33 Drivers aged 21 to 35 are more likely to be involved in alcohol-impaired traffic fatalities in both urban and rural areas. It is well established that rural adults are more likely to report heavy drinking and binge drinking,34 and have higher rates of illicit drug and prescription drug abuse. Factors such as poverty, social isolation, unemployment, limited access to mental healthcare, and limited transportation options make substance use and misuse more difficult to combat in rural areas.35 Further, alcohol-impaired drivers in rural areas are more likely to die in MVCs than those in urban areas. Limited resources in rural areas have hindered the implementation of certain interventions such as sobriety checkpoints, and there are limited alternative means of transportation, especially after 5 p.m. when social drinking is likely to occur.36 Further, data from Maryland show that in rural fatal crashes, drivers were more likely to be under the influence of opioids, especially among middle-aged and White drivers. Drivers under the influence of alcohol are more likely to sustain severe injuries, and the level of drug impairment increases the severity of the injuries.37
Variation by Rural Region

The use of public transit systems varies across U.S. census regions. Research from the Pew Research Center shows that 25% of adults use public transit systems in the Northeast compared to 7%, 8%, and 9% of adults in the South, Midwest, and West, respectively. However, analysis of the 2019 American Community Survey showed that 1.3% of workers living outside metropolitan areas in the West used public transit to travel to work compared to 0.6% of workers in the Northeast, 0.4% in the Midwest, and 0.3% in the South. Factors such as road quality, traffic volumes, driver behaviors, and weather conditions vary across the four census regions in the U.S. For example, rural areas of the Northeast region have more windy roads and hilly terrains, and crashes are more likely to occur due to reduced visibility, narrow lanes, and sharp turns. Icy roads in the winter season also increase the risk of crashes. The roads in the rural Midwest and West regions are long, straight and have high speed limits. Drivers on these roads are at higher risk of driver fatigue, distracted driving, and speeding. Tornadoes and blizzards also increase the risk of MVC in these areas. Rural roads in the South are narrow and have small shoulder space and may be difficult to maneuver. Other factors affecting the number of MVC deaths include population density, road conditions, travel speed, traffic laws, available emergency services, and weather conditions.

Data from the U.S. Department of Transportation’s Fatality Analysis Reporting System show that in 2021, deaths from MVCs were highest in Mississippi (29.4 per 100,000 persons) and lowest in Massachusetts (6.6 per 100,000 persons). For MVCs by rurality, death rates are highest in the most rural, central regions of the U.S., where driving distances tend to be longer. Crash fatalities in rural counties of West Virginia are also among the highest for rural counties nationally.

OTHER FACTORS ASSOCIATED WITH TRANSPORTATION

Traffic Fatalities and Risky Driver Behavior

Data from the 2018 Fatality Analysis Reporting System show that there are racial/ethnic disparities in traffic fatalities, even after accounting for travel volume and mode. In 2018, American Indian and Alaska Native (AI/AN) people had the highest number of traffic fatalities (21.75 fatalities per 100,000 population), followed by Black (13.47), non-Hispanic Pacific Islanders (13.31), White (10.92) and Hispanic people (9.44). Asian people had the lowest rates – three fatalities per 100,000 population. Between 2014 and 2018 however, relative to White individuals, the number of traffic fatalities lessened for AI/AN people but doubled for the Black population.

Some factors have been attributed to the observed disparities. These include risky driver behaviors such as alcohol-impaired driving, restraint use, and distracted driving. Others include road infrastructure that makes walking or cycling riskier for Blacks, Hispanics, and AI/AN. For driver behaviors, data from the Fatality Analysis Reporting System showed that AI/AN people had the highest travel volume and the highest percentages of alcohol-involved traffic fatalities (57%). Alcohol-involved traffic fatalities contributed to roughly one in three crash fatalities among Black and Hispanic people in 2018.

Restraint Use

For restraint use, analysis of the Fatality Analysis Reporting System showed that AI/AN, Black and non-Hispanic Pacific Islanders were more likely to be unrestrained at the time of a crash fatality compared to White people, while Asian vehicle occupants used restraint systems more. Similar trends were observed for child restraint use.

In 2018, 44% of Black people were restrained in MVC fatalities involving passengers, compared to 55% of White people. In addition, speeding contributed to over 30% of traffic fatalities among non-Hispanic Pacific Islanders, AI/AN and Blacks. The NHTSA cautions that there are limitations to the race/ethnicity data collected and some caution should be used when interpreting these findings.

PROVEN SOLUTIONS OR INTERVENTIONS

Improving mass transit in rural areas can be challenging due to low population density, dispersed residential patterns, and limited funding options. However, several initiatives have been undertaken to improve transportation
options for rural communities. Community transportation programs transport individuals who are unable to use public transportation due to physical, cognitive, or financial limitations. The Transportation Reimbursement Incentive Program (TRIP) is a community program that reimburses friends and neighbors for taking older adults and disabled persons to medical care and other approved purposes. For more than 20 years, the program has provided over 1.6 million free rides to over 5,000 adults. Ride sharing platforms such as Uber and Lyft are taking on new roles and expanding their services to provide transportation specifically for medical appointments. However, whether rural residents will use these services if they become available remains uncertain.

Several efforts have been made to reduce deaths from MVCs in rural areas, some of which are described below:

*Improving Infrastructure.* Traffic safety interventions include sealing shoulders, providing turning lanes at intersections, separating opposing traffic with wide medians, and installing warning signs on lengthy rural two-lane highways. A study using multiple data sources from Idaho showed that installing rumble strips on two-lane rural roads reduces crashes on highways with and without horizontal curves. Other interventions include installing streetlights near intersections to increase visibility and reduce the severity of crashes, particularly when it is dark.

*Enforcement programs.* These programs include reducing speed limits, mandating seat belt and car seat use, enforcing helmet use for ATV riders, and implementing alcohol consumption limits. It is well established that reducing speed limits improves traffic safety and reduces MVCs, including those from motorcycles. Reducing speed limits have been shown to increase the reaction time of drivers, thus, allowing them to make last-minute maneuvers before an impact occurs. Consistent use of seat belts on rural roads offsets fatalities from MVCs often caused by poor road quality, unenforced speed limits, narrow lanes, and lack of road shoulders. Further, evidence shows that correct placement of age-appropriate child safety seats increases safety and reduces the risk of crash death by about 54%, and also reduces the severity of traumatic injuries experienced by children ages one to four. It has been suggested that laws that enforce use of helmets among ATV drivers also reduce the severity of ATV-related MVCs. Approaches to reducing alcohol-impaired MVCs include enforcing laws that prohibit driving with blood alcohol levels of greater than 0.08, prohibiting open containers of alcohol in vehicles, and increasing sobriety police checkpoints. Limited research suggests that delaying school start time to 8:30 a.m. might reduce drivers' fatigue and drowsiness.

*Public education campaigns.* This refers to campaigns that are highly visible and targeted towards specific groups, such as males, pick-up truck drivers, or rural residents. Such campaigns have been quite effective at increasing seat belt use, especially when combined with publicized intentions for primary enforcement. Thus, public awareness campaigns regarding seat belt use that contain messages specific to rural life experiences and culture are more likely to increase the knowledge, attitude, and beliefs towards seat belt use among rural drivers. Regarding deaths from ATVs, an ATV safety education program in rural central Illinois proved to be an effective community intervention toward improving the safety knowledge and riding behavior of rural youth in the area.

**SUMMARY AND CONCLUSIONS**

Motor vehicle crashes remain a public health threat. Public policies and programs that improve rural road infrastructure, enforce speed limit laws, ensure alternative means of transportation, especially for the intoxicated, and make targeted public education campaigns are critical to reducing MVCs and saving lives.

As private and governmental entities work to improve public transportation that will support rural residents’ well-being by providing transportation to employment, schools, as well as social and recreational destinations, efforts must be made to encourage ridership. Public transportation systems are critical for those who are historically considered racial/ethnic minorities, those who earn less, and for the elderly. The consequences of poor access to public transit might mean residents forgo...
economic, educational, recreational, and healthcare opportunities. Maintaining viable community transportation services will involve the input of federal, state, local and not-for-profit organizations. Technological advancements may reduce the need for commuting as more rural residents are able to work and receive healthcare remotely, thus reducing the need for more frequent transportation.

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Related Chapters:
Chapter 5. Rural Substance Misuse Trends in America
Chapter 10. Rural Economic Stability
Chapter 14. Housing and Homes: Implications for Rural Americans’ Housing Conditions, Mental Health Outcomes, and Overall Well-being

Suggested Chapter Citation:
DISPARITIES AND OPPORTUNITIES ACROSS THE CANCER CONTINUUM IN RURAL AMERICA

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SCOPE OF THE PROBLEM

- Cancer was identified as the 12th most highly ranked priority from the Rural Healthy People 2030 survey.¹
- On average, rural residents live more than two to five hours from most cancer services ranging from fundamental screening services to clinical trials, survivorship care, and end-of-life care.²
- Cancer-associated mortality rates for persons living in rural counties are much higher compared to cancer-associated mortality for urban residents.³,⁴
- Mortality rates for many cancers are higher in rural areas than in urban areas including: 10% higher for cancers of the lung and bronchus, 2% higher for female breast cancer, 5% higher for colorectal cancer and 1% higher for pancreatic cancer.¹
- Across all geographic designations (rural and urban), mortality rates associated with breast cancer and prostate cancer for Black individuals are significantly higher, while Hispanic individuals have the highest incidence of late-stage cervical cancer. In addition to cervical cancer, the incidence rate of liver cancer is particularly high among Hispanics in the U.S.⁵
- Colorectal cancer incidence rates are higher in men, and these rates are significantly higher in rural areas due to delayed screening in comparison to urban individuals.⁶

Despite significant progress made in overall awareness of rural versus urban health disparities across our nation, awareness has not resulted in specific goals and strategies to improve cancer in many areas of the United States. Approximately 68% of comprehensive cancer control plans across the U.S. and territory/tribal areas include the word “rural” in their plan; however more than two-thirds of the plans do not have rural-specific strategies.⁶

In addition, when it comes to accessing cancer providers, shortages have improved over the last decade growing from 3% to 12-15% of oncologists living in rural areas.⁷,⁸ However, 42% of non-metropolitan counties still have no oncologists.²

1. RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

In Healthy People 2030, the overall goal for cancer is to “reduce new cases of cancer and cancer-related illness, disability, and death.”²⁹ Specific Healthy People 2030 cancer objectives call for decreasing death rates from female breast cancer, prostate cancer, colorectal cancer, and lung cancer. Improved communication with providers and increased genetic counseling are specific objectives to contribute to cancer prevention. Early detection of oral/pharyngeal cancers, and increased cancer screening, are additional objectives aimed at reducing cancer incidence and mortality. Healthy People 2030 also seeks to improve five-year cancer survival rates. Some of the following Healthy People 2030 objectives are discussed in this chapter relevant to the published rural-focused literature on cancer screening, incidence, mortality, and survivorship in the U.S.

Five objectives related to cancer mortality have been improving over the last decade. Although 149.1 cancer deaths per 100,000 persons occurred nationally in 2018, a continuing decrease (144.1) in
overall cancer deaths per 100,000 was seen in 2020.\textsuperscript{10} The target goal for 2030, established in Healthy People, is 122.7 or fewer cancer deaths per 100,000.\textsuperscript{9}

- C-01 Reduce the overall cancer death rate
- C-02 Reduce the lung cancer death rate
- C-04 Reduce the female breast cancer death rate
- C-06 Reduce the colorectal cancer death rate
- C-08 Reduce the prostate cancer death rate

To establish reliable baseline data and identify an evidence base for interventions, additional research is needed for these two Healthy People 2030 objectives related to survivorship.\textsuperscript{9}

- C-R01 Increase quality of life for cancer survivors
- C-I1 Increase the proportion of cancer survivors who are living five years or longer after diagnosis

These seven Healthy People 2030 objectives are related to cancer prevention and screening, and are discussed in this chapter, relative to rural disparities.

- C-R02 Increase the proportion of people who discuss interventions to prevent cancer with their providers
- OH-07 Increase the proportion of oral and pharyngeal cancers detected at the earliest stage
- C-03 Increase the proportion of adults who get screened for lung cancer
- C-05 Increase the proportion of females who get screened for breast cancer
- C-07 Increase the proportion of adults who get screened for colorectal cancer
- C-09 Increase the proportion of females who get screened for cervical cancer
- C-D01 Increase the proportion of females who get genetic counseling for breast and/or ovarian cancer

To address this priority health issue and improve cancer outcomes, rural health should be examined through primary, secondary, and tertiary prevention. Primary cancer prevention strategies examine the known causes of cancer and help to identify modifiable risk factors that can be improved to prevent disease.\textsuperscript{11} Secondary prevention involves strategies to screen and identify cancer early.\textsuperscript{15} Tertiary prevention involves access to cancer treatment and minimizing the complications and mortality resulting from a cancer diagnosis, in other words cancer control.\textsuperscript{16} In this chapter we will examine the disparities in primary, secondary and tertiary prevention and identify proven interventions and solutions for rural populations.

3. MOST PREVALENT AND/OR PREVENTABLE CANCERS

To align with the Healthy People 2030 goals, this chapter will focus on the six most prevalent and/or preventable cancers: breast, cervical, colorectal, lung, oral/pharyngeal and prostate cancer.

3.A. Primary Prevention: Environmental Exposures and Known Causes of Cancer

In historically marginalized communities, exposures such as second-hand smoke, water contamination due to industrial zoning, and factory byproducts increase the risk of cancer diagnoses and deaths.\textsuperscript{17} Due to redlining (financially discriminatory practices based on the racial/ethnic demographics and/or low socioeconomic status of a neighborhood) and other political processes, Black Americans often live in areas where there is a high rate of exposure to toxins, industrial facilities, and pollution levels.\textsuperscript{17}

In rural areas, the chemical combinations used in agriculture and farming to address pests and...
weeds are considered human carcinogens.\textsuperscript{18,19} In addition, limited employment opportunities in rural areas may increase exposure to toxic chemicals, pollution, and carcinogens.\textsuperscript{20} These carcinogens affect hormone production and increase the inflammatory process, contributing to the incidence and burden of cancer in these populations.\textsuperscript{21}

In addition to environmental exposures, modifiable behavioral risk factors such as obesity, diet, sun exposure, tobacco and alcohol use are linked to increased cancer incidence.\textsuperscript{22} Per the 2030 Rural Healthy People rankings, all of these modifiable risk factors, with the exception of sun exposure, are in the top 10 priority problems for rural communities (i.e., 4th - Overweight and Obesity, 5th - Drug and Alcohol Use, and 6th - Nutrition and Healthy Eating).

Obesity rates are higher in rural communities.\textsuperscript{25} Dietary intake is influenced by the lower socioeconomic status of rural individuals who are less able to afford healthy foods and access healthy foods.\textsuperscript{21-26} In addition, individuals living in rural areas report less physical activity than those in more suburban or urban settings.\textsuperscript{26}

Smoking rates continue to be higher in rural areas than urban settings, which is reflected in higher rural incidence and mortality rates.\textsuperscript{27-29} Smokeless tobacco use is also higher in rural areas.\textsuperscript{27} Excessive alcohol use in rural areas of the U.S. is variable by region.\textsuperscript{30} Higher rates of alcohol use have been reported in some regions of the U.S., with the largest concentrations of counties in the upper Midwest and scattered clusters of counties throughout the Mountain West, Alaska and Nevada.\textsuperscript{30} In comparison, the Southeast reported lower levels of excessive alcohol use in rural counties.\textsuperscript{30} However, variation exists within states’ rural areas, with individual rural counties in many states reporting different levels of alcohol use.\textsuperscript{30}

### 3.B. Incidence

Cancer incidence rates in rural areas from 2011 to 2019, varied across the six most prevalent and/or preventable cancers (Figures 1a through 1f). The levels of rurality shown are based on the United States Department of Agriculture Economic Research Service (USDA-ERS) Rural-Urban Continuum Codes (RUCC) 2013 criteria. The RUCC classification includes nine levels of rurality. For Figures 1a through 1f, the three RUCC metropolitan categories were kept as is while RUCC 4 and 5 were combined to indicate urban counties with a population $\geq 20,000$, RUCC 6 and 7 were combined to indicate urban counties with a population of 2,500-19,999, and RUCC 8 and 9 were combined to indicate rural counties with $<2,500$ population.

There were important differences in breast cancer incidence trends across levels of rurality.\textsuperscript{31} Although breast cancer incidence increased among all women from 2011 to 2019, this increase has not been equal across levels of rurality.\textsuperscript{31} For example, age-adjusted female breast cancer incidence increased by 5.1 points in metropolitan counties with $>1$ million population and in metropolitan counties with 250,000-1 million population, by 8.4 points in urban counties $<250,000$ population, by 10.3 points in urban counties with $>20,000$ population, by 6.7 points in urban counties of 2,500-19,999 population, and by 3.1 points in rural counties with $<2,500$ population.\textsuperscript{31}

Improvements in cervical cancer incidence were limited to those residing in the most urban counties (metropolitan counties $>1$ million population) and the most rural counties (rural counties with $<2,500$ population), with declines of 0.3 points in both areas.\textsuperscript{31} In contrast, cervical cancer incidence increased by 1.6 points in urban counties with 2,500-19,999 population. Much smaller increases in cervical cancer incidence were observed in metropolitan counties with 250,000-1 million population, metropolitan counties $<250,000$, and urban counties of $>250,000$.\textsuperscript{31}

In contrast to breast and cervical cancer, the incidence of colorectal cancer has declined across all levels of rurality from 2011 to 2019. However, the decrease in incidence has not been equal across all rurality levels. For example, from 2011-2019 colorectal cancer incidence dropped by 5.2 and 3.7 points in metropolitan areas of $>1$ million population and metropolitan areas of 250,000-1 million population, respectively. Whereas, colorectal cancer incidence rates in urban counties of 2,500-19,999 population and rural counties with $<2,500$ population declined by 2.5 and 2.9 points, respectively.\textsuperscript{31} Furthermore, urban-rural disparities in colorectal cancer persist.\textsuperscript{31} As of 2019,
colorectal cancer incidence in metropolitan areas of >1 million population was 35.9 per 100,000 population compared to 43.5 per 100,000 in rural counties with <2,500 population.\cite{31}

In addition to colorectal cancer, the incidence of lung cancer has also declined across all levels of rurality from 2011 to 2019.\cite{31} Interestingly, unlike colorectal cancer, rural counties experienced the greatest improvement in lung cancer incidence over time.\cite{31} For example, age-adjusted lung cancer incidence rates dropped by 12.9 points in rural counties, whereas a decline of 9.9 points was observed in metropolitan counties of >1 million population.\cite{31} Unlike colorectal and lung cancer incidence, no such improvements were observed in incidence of oral/pharyngeal cancer.\cite{31} The incidence of oral/pharyngeal cancer increased marginally over the last decade across all levels of rurality except in metropolitan counties with >1 million, which showed a slight decrease of 0.1 points (from 11.4 in 2011 to 11.3 in 2019).\cite{31} Furthermore, urban-rural disparities in oral/pharyngeal cancer incidence were observed.\cite{31} As of 2019, the age-adjusted incidence rate of oral/pharyngeal cancer was 13.8 per 100,000 population in rural counties with <2,500 population compared to 11.3 per 100,000 population in metropolitan areas of >1 million population.\cite{31}

Similar to trends observed for colorectal cancer and lung incidence, the incidence of prostate cancer also declined across all levels of rurality from 2011 to 2019.\cite{31} However, declines in prostate cancer incidence were larger in metropolitan areas compared to rural.\cite{31} For example, prostate cancer incidence dropped by 22.9 points in metropolitan areas with >1 million population while rural counties with <2,500 population experienced a much smaller decrease of 13.1 points.\cite{31} Despite showing slower declines, rural counties with <2,500 population had the lowest incidence of prostate cancer from 2011 to 2019.\cite{31}

In contrast, metropolitan areas had the highest prostate cancer incidence rates.\cite{31} This higher incidence of prostate cancer in urban areas has been attributed to a greater proportion of the population being screened and earlier detection.\cite{31}

**Figures 1.a. through 1.f. Cancer Incidence by Population area, 2011-2019 SEER Data**\cite{31}
3.C. Secondary Prevention: Barriers in Access to Cancer Screening

Barriers to cancer screening exist at both the individual and system level. Examples of individual barriers include fear of cancer detection, distrust of the healthcare system, race/ethnicity, culture, socioeconomic status, employment status, lack of health insurance, and cost. Systemic barriers include geographic location and limited access to healthcare and screening services. These barriers vary demographically as well as regionally, an indication that it is crucial that strategies to improve cancer screening rates be culturally relevant.

Breast Cancer. Breast cancer tends to be more common in urban areas rather than rural areas; however, this may be due to increased access to mammography in urban centers. Individuals living in areas with higher Area Deprivation Index scores (ADI, a measure of social determinants of health), as well as those who live in more rural areas, were less likely to be screened for breast cancer. Barriers to mammography were more often reported by rural dwellers when compared to their urban counterparts. The barriers most often reported by rural dwellers were lack of insurance coverage or the cost of care; however, rural individuals also reported caregiving and other work-related responsibilities prevented them from receiving their mammogram. Although breast cancer is most common in non-Hispanic Black women (92%), this same population is also more likely to report barriers to mammography compared to White women.

Cervical Cancer. Higher ADI scores and living in a rural area were predictors for reduced cervical cancer screening rates. Rural women were less likely to be screened through standard Papanicolaou (pap) smear and less likely to be screened for human papilloma virus (HPV). Vaccination for HPV was lower in rural teen girls and boys versus their urban counterparts, and completion of the series of vaccinations was also lower for rural teens. White women are more likely to have received HPV vaccines than non-Hispanic Black, Hispanic and Asian women. When surveyed in the health care setting, knowledge of the HPV vaccine was lower among American Indian women receiving care in a rural tribal clinic in comparison to a non-rural clinic serving primarily White women. A favorable attitude toward HPV vaccination depended upon knowledge of the vaccine among all women.

In a large, longitudinal cohort of low-income and uninsured women, those who were older than 50 years, American Indian/Alaska Native, multiracial, living in nonmetropolitan areas, or living in the South or a territory were more likely to report being never or rarely screened for cervical cancer. When screened, the incidence of an abnormal pap smear was highest in all of the aforementioned groups.

Cervical cancer screening rates in 2020 among American Indian/Alaska Native women were below the national average of 73.5% (ranging between 57.1% - 65.0%) with the lowest rates among those women 50-64 years of age. In the first year of the COVID-19 pandemic, American Indian/Alaska Native and Asian/Pacific Islander women had the greatest decline in cervical cancer screening.
It has been reported that more than half of rural-dwelling women traveled 60 miles to reach an oncologist for gynecological cancer care compared to eight miles for their urban counterparts.41

Similarly, rural non-Hispanic Black women also had higher rates of regional and distant-stage cancers and were more likely at diagnosis to have an unknown stage of disease.45

Colorectal Cancer. Uninsured individuals with colorectal cancer were more likely than insured individuals to have stage IV disease at diagnosis.46 Access to paid sick leave and health insurance were positive predictors of colorectal screening while living in a higher ADI area and/or rural area was associated with reduced rates of colorectal screening.44,47 Patient-reported barriers to colorectal screening include transportation, cost of screening, fear of colonoscopy procedure and lacking symptoms.48

Colorectal cancer is the fourth most commonly diagnosed cancer for non-Hispanic Black men and women.1 Hispanic adults are less likely to be screened than White adults.49 Rural American Indian/Alaska Native are more likely to travel a great distance for colorectal cancer care compared to urban dwellers.41 Across many types of health systems, American Indian/Alaska Native people are less likely to have completed colorectal cancer screening when compared to non-Hispanic Whites.50 In addition, the quality of colonoscopy screening in rural areas for American Indian/Alaska Native and other populations is lower, although there is variability across providers.19 Both urban and rural American Indians/Alaska Natives have a significantly lower adherence to timely colon cancer screening compared to non-Hispanic Whites.34,35

Lung Cancer. For both non-Hispanic Black men and women, lung is the third most common cancer.8 In an urban setting, lung cancer screening appointments were more likely to be missed when individuals identified as Black or were insured by Medicaid.54 In addition, those who reported housing insecurity were less likely to follow up after their initial exam.54 Rural individuals were less likely to follow-up for annual screening after their initial screening.55

Oral and Pharyngeal Cancers. While there is no standard recommended screening for oropharyngeal cancers, due to a lack of evidence on improved mortality, regular dental or physical exams that include visual oral exams may help diagnose cancers.36 Accessibility to regular oral care is challenging as oral health insurance for adult Medicaid patients varies by state implementation and Medicare has limited coverage for some dental procedures.37,38

In the U.S., HPV is estimated to be the cause of nearly three of every four oropharyngeal cancer diagnoses.39 As addressed above in the cervical cancer section, rural teens are less likely to receive HPV vaccines and less likely to complete the series of vaccinations.38

Prostate Cancer. Similarly to breast cancer, prostate cancer tends to be more common in urban areas rather than rural areas; however, this may be due to increased screening in urban centers.1 Prostate cancer is the most common cancer in non-Hispanic Black men (37%).1 While prostate cancer is the most common cancer in Hispanic men, the rates of prostate cancer are lower than in non-Hispanic White men.1 However, Hispanic men in Puerto Rico have significantly higher (70% higher) rates than Hispanic men living in the continental United States.1

3.D. Mortality

While the incidence of cancers in rural areas tends to be lower than, or at similar rates as, larger urban areas, cancer-related mortality rates are higher across all six cancers discussed in this chapter. The U.S. Black population is disproportionately impacted by both cancer incidence and mortality. Non-Hispanic Black adults have the highest mortality rates of all cancer sites combined in the U.S.1,2 Prostate, breast, lung, and colorectal cancers have the highest mortality accounting for approximately 41% of all cancer deaths in non-Hispanic Black women and 50% in non-Hispanic Black males.1,9 Please see Figures 2a through 2f for cancer mortality by population area from the 2011-2020 Centers for Disease Control and Prevention (CDC) Wide-ranging ONline Data for Epidemiologic Research (WONDER) data.60 The CDC Wonder mortality data defines rurality using the 2013 National Center for Health
Statistics urban-rural classification scheme which includes six levels (i.e., large central metro, large fringe metro, medium metro, small metro, micropolitan, noncore).

Evidence over the past decade reveals important differences in cancer mortality trends across both types of cancer and across levels of rurality. In the case of breast cancer, data from the CDC WONDER database shows that cancer mortality has declined across all levels of rurality over the past decade. Importantly, however, improvements in mortality have not been consistent across levels of rurality. While the age-adjusted mortality rate dropped by 3.6 points in large central metropolitan areas, it has only dropped by 1.7 points from 2011-2020 in rural noncore areas, suggesting that mortality gains have been more modest in rural communities.

Even as improvements have been seen in breast cancer, these consistent improvements have not been seen in other areas like cervical cancer. For cervical cancer, improvements in mortality were seen between 2011-2020 in large central metropolitan, small metropolitan, and noncore areas but not in large fringe metropolitan, medium metropolitan, or micropolitan areas. In fact, cervical cancer mortality rates have increased in micropolitan areas and even in areas where improvements in mortality have been seen, those improvements have been quite small, never surpassing a drop in the age-adjusted mortality rate by more than 0.3.

In stark comparison, massive improvements in mortality rates have been seen for lung cancer. For example, age-adjusted mortality rates have dropped by 14.4 points in large central metropolitan areas, by 14.5 points in large fringe metropolitan areas, by 13.5 points in micropolitan areas, and by 13.1 points in noncore areas. Critically however, consistent disparities in mortality rates for lung cancer remain between urban and rural areas. By 2020, the age-adjusted mortality rate for lung cancer was only 26.4 in large central metropolitan areas and increased steadily across levels of rurality, reaching a peak of 41.9 in rural noncore communities. These results suggest that while important strides in lung cancer mortality have been seen, disparities across levels of rurality in outcomes that were observed at the start of the last decade, remained by 2020.

While important reductions in mortality rates have been seen for lung cancer, oral cancer has not seen similar improvement. Instead, oral cancer rates did not decline across any level of rurality from 2011-2020. In fact, oral cancer rates increased marginally over the last decade across all levels of rurality except in large central metropolitan areas. Equally troubling, rural-urban disparities exist for oral cancer. While the age-adjusted mortality rate was 2.4 in large central metropolitan areas and 2.3 in large fringe metropolitan areas in 2020, it was 3 in micropolitan areas and 3.2 in rural noncore communities.

Finally, when examining prostate cancer mortality using CDC WONDER data, we see evidence that prostate cancer mortality declined across all levels of rurality from 2011-2020. Notably however, rural-
urban disparities in prostate cancer mortality persist. Mortality rates are lowest in large central and large fringe metropolitan areas and highest in micropolitan and noncore areas. In addition, while mortality rates have dropped across levels of rurality, declines in mortality have been larger in large central metropolitan areas than in noncore areas.


Over the past decade most cancer care has moved to the outpatient setting. However, as costs of outpatient and prescription medications increase, cost-related medication adherence increases with the bulk of expenditures coming from outpatient treatment. Increasing out-of-pocket costs of care have led to reduced adherence to medications for both rural and urban cancer survivors. Regardless of where a person resides, non-Hispanic Black survivors and survivors with multiple comorbidities were more likely to experience cost-related medication nonadherence. Per a survey of Medicare recipients, rural non-Hispanic Black and Hispanic survivors of breast, colorectal, lung, and prostate cancer reported lower ratings for accessing needed care versus their rural White counterparts. Rural White Medicare recipient survivors of breast, colorectal, lung and prostate cancer were more likely to report they received care quickly and accessed needed care than urban White cancer survivors. Rural Medicare recipients who identified as non-Hispanic Asian/Pacific Islanders also reported higher ratings for receiving care quickly versus their urban counterparts; however, it was not a statistically significant difference.

Disparities in cancer control services continue to exist and persist in rural areas. Rural non-Hispanic Blacks have decreased/shorter survival rates for breast, lung, and colorectal cancer. Similarly, rural non-Hispanic Black women also had higher rates of regional and distant stage cancers and were more likely at diagnosis to have an unknown stage of disease. These increased cancer rates may be attributed to an increase in...
cancer-related behavior and conditions such as smoking, excessive weight, alcohol consumption, poor diet, and poor physical activity. The lack of health-promoting behaviors creates an increased risk for cancer.\(^1\)

For non-Hispanic Black adults, barriers such as inadequate access to and availability of health care services, lack of knowledge of cancer prevention and screening recommendations, culturally inappropriate or insensitive cancer control care and services, low health literacy, access to technology, and historically rooted medical distrust all impact the association between race and cancer mortality.\(^{63-68}\)

Social and built environments are other factors that contribute to disparate cancer outcomes. Neighborhood characteristics such as socioeconomic status, educational attainment, residential segregation, availability of fresh food, and public services intersect with cancer health disparities.\(^{1,2,69}\) One additional risk factor that is unique to the non-Hispanic Black population is psychological stress, particularly in breast cancer.\(^{1,70}\) The compounding factors, along with persistent poverty in rural areas, are the catalyst for the increase in cancer-related mortality in at-risk populations and rural populations. Systemic barriers in cancer care exist including limited access to rural cancer providers, lack of integration of care between cancer providers and primary care, and a paucity of connections between cancer centers and primary care providers.\(^{71}\)

**Breast Cancer.** While disparities in breast cancer mortality are improving,\(^4\) they are still prevalent due to treatment-related barriers especially in certain populations.\(^{72-75}\) Non-Hispanic Black women were more likely to have delays in receiving breast cancer treatments (hormone therapy, chemotherapy, surgery, and radiation) compared to White women and rural non-Hispanic Black women were more likely to have chemotherapy delayed versus rural White women.\(^{72-75}\)

**Cervical Cancer.** In the U.S., Black, American Indian/Alaska Native and Hispanic women are more likely to die from cervical cancer than White or Asian/Pacific Islander women.\(^{76}\) Non-Hispanic Black women, the group with the highest mortality rates, are one and a half times more likely to die from cervical cancer than White women.\(^{76}\) Cervical cancer mortality rates are lowest for Asian/Pacific Islander women, who are the only group with lower mortality rates than White women.\(^{76}\) Hispanic women and non-Hispanic Black women are more likely to be diagnosed with cervical cancer at an advanced stage and at older ages than White women.\(^{77}\) A large disparity exists with Black women having lower five-year survival rates than all other ethnicities.\(^{76}\)

**Colorectal Cancer.** Research on access to surgery has had varied results. In one study, insured rural and non-Hispanic Black individuals were less likely to receive surgery for colorectal cancer.\(^{16}\) However, in an alternate study, rural Medicare patients had surgery sooner than their urban counterparts and traveled an average of 32.2 miles, primarily having surgery in a metropolitan area.\(^{78}\) In the Medicare study, surgeries were more likely to be emergent and more invasive than the surgeries their urban counterparts experienced.\(^{78}\) When rural non-Hispanic Black individuals were able to have surgery they were more likely to experience postoperative mortality when compared to urban dwelling non-Hispanic Black individuals; whereas, rural White individuals were less likely to experience postoperative mortality when compared to urban dwelling White individuals.\(^{78}\) Non-Hispanic Black and Hispanic Medicare patients were more likely to live in a higher ADI area than White Medicare patients.\(^{78}\)

**Lung Cancer.** Uninsured individuals with lung cancer were more likely to have stage IV disease at diagnosis and were less likely to have surgery for lung cancer.\(^{46}\) This may be due to late-stage disease at diagnosis as surgery is generally recommended as treatment for early-stage lung cancer.\(^{79}\) Rural individuals are more likely to be uninsured which puts them at risk for late-stage disease. Rural patients, Black patients and patients receiving Medicaid were less likely to receive surgery from a specialist (i.e. a thoracic surgeon).\(^{46}\)

**Oral and Pharyngeal Cancers.** Rural patients with HPV-positive oropharyngeal cancers have poorer survival rates when compared to urban patients with HPV-positive cancer.\(^{80}\)

**Prostate Cancer.** A greater than 90-day treatment delay in receiving prostate cancer treatment was
more likely to occur in Black individuals rather than White individuals. Delays were also more common for individuals with early-stage disease, those not requiring surgery and younger patients (18- to 54-year-olds) however rural patients were more likely to receive timely treatment.

4. HEALTH CARE EXPANSION AND IMPACT ON POLICY

Enacted in 2010, the Patient Protection and Affordable Care Act (ACA) aimed to increase insurance coverage and improve access to care through several mechanisms, including the expansion of Medicaid eligibility, extending dependent coverage to young adults until age 26, and establishment of the Health Insurance Marketplace. The policy also required all insurers to provide coverage for preventive care services (including cancer screenings) with no cost-sharing. The ACA also included a $15 billion investment into proven prevention and public health programs such as smoking cessation and obesity treatment.

Medicaid expansion started in January of 2014 with 24 states adopting and implementing the expansion immediately. Since 2014, Medicaid expansion has continued to be adopted and as of January 2023, of the 39 states who have adopted expansion, 38 have implemented and the remaining state will implement in July 2023. While expansion has been adopted in many states with rural populations, many of the states who have not expanded Medicaid have significant rural populations.

Extensive evidence suggests that the ACA improved insurance coverage and increased access to care for millions of Americans, including rural residents. Other studies have found the ACA to be associated with increased mammography, cervical, and colorectal cancer screening in the general population. Evidence also suggests that the ACA increased early stage diagnosis for lung, ovarian, colon, and breast cancers, likely as a result of improved access to screening services. Although the positive effects of the ACA on healthcare access and outcomes are well documented, the majority of research is focused on the general population, and very few have examined policy impacts among rural residents. It is possible that the ACA may not have impacted individuals living in rural areas to the same extent as those in urban areas, because access to health services in rural areas are limited due to geographic isolation, provider shortages, high rates of uninsurance, and economic stagnation. Thus, more work is needed to better understand if the ACA has impacted rural and urban populations equally.

5. PROVEN SOLUTIONS OR INTERVENTIONS

Several interventions/solutions have been shown to increase cancer screening. Individuals are more likely to receive colorectal screening if they have regular access to their health care provider and have spoken to their provider about their risk factors. They are also more likely to know their family health history when they regularly see their provider. Evidence shows that nurse practitioners, working in medically underserved and rural areas where there are few physicians, can provide quality, cost-effective care particularly cancer screening and prevention. In addition, community health workers (CHWs) are able to address several critical barriers to cancer screening, while providing culturally relevant education and navigation, resulting in increased screening rates. A simple, low-cost text messaging intervention for American Indian/Alaska Native people demonstrated improved colorectal cancer screening rates.

Cancer control strategies from treatment through survivorship are being piloted across the nation. To improve cancer care in rural communities, National Cancer Institute-designated cancer centers can provide support with accreditation of rural community hospitals. A pilot study of a survivorship CHW education intervention was shown to be feasible and may benefit survivors complex care needs and those with low health literacy.

6. SUMMARY AND CONCLUSIONS

Rural cancer health disparities persist in the U.S. Barriers exist across the cancer continuum from primary prevention to cancer screening and cancer control. As cancer costs continue to grow, effective primary prevention should target interventions to
reduce pollution and toxins, obesity, smoking and alcohol disparities. Continued implementation and development of secondary prevention screening strategies that improve access to providers and screening services are needed. Tertiary cancer control interventions need to be created and piloted for rural communities. Rather than a small subset of states, all fifty states need rural-specific cancer strategies in their comprehensive cancer control plans.

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Related Chapters:
Chapter 3. Rural Healthcare Access and Quality
Chapter 15. An Examination of the Workforce in Rural America
Chapter 17. Health Insurance for Rural Americans
Chapter 19. Hospital and Emergency Services in Rural Areas

Suggested Chapter Citation:
Public health in the rural United States has been crucial to advancing rural wellness despite considerable capacity challenges. In the 2030 Rural Healthy People survey (see Table 1), 24.5% of respondents identified public health infrastructure within their top ten priorities for rural public health.\(^\text{1,2}\) Strategies to overcome chronic underfunding include intergovernmental transfers, as well as cross-sector and cross-jurisdictional partnerships.\(^\text{3}\)

Resource limitations often compromise rural local health departments’ (LHDs) access to current information on evidence-based practices,\(^\text{4}\) and to various forms of technology.\(^\text{5,6}\) Without sufficient information technology, rural LHD performance management and quality improvement can be undermined.\(^\text{7}\)

Accreditation is a powerful tool for improving rural LHDs’ staff competencies, partner relations, and capacity to provide high-quality services. However, only 8% of small LHDs apply for accreditation due to capacity challenges.\(^\text{8,9}\)

Community Health Assessments (CHAs) and Community Health Improvement Plans (CHIPs) are foundational to community wellbeing.\(^\text{10}\) However, a minority of LHDs serving small jurisdictions conducted a CHA in the previous five years,\(^\text{11}\) and the odds of rural LHDs conducting a CHA have decreased over time.\(^\text{12}\)

Resource limitations and remote geography yield challenges with recruiting, retaining and developing the rural public health workforce.\(^\text{3}\) These challenges intensified amidst the COVID-19 pandemic.\(^\text{13}\) Bolstering the rural public health workforce can occur via educational,\(^\text{14}\) financial,\(^\text{3}\) and/or regulatory\(^\text{1}\) strategies.
### Table 1. Comparison of top 20 Rural Healthy People priorities selected overall vs U.S. census region

<table>
<thead>
<tr>
<th>Priority</th>
<th>Overall No.</th>
<th>Overall %</th>
<th>Midwest No. (n = 326)</th>
<th>Midwest %</th>
<th>Northeast No. (n = 129)</th>
<th>Northeast %</th>
<th>South No. (n = 339)</th>
<th>South %</th>
<th>West No. (n = 224)</th>
<th>West %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Health and Mental Disorders</td>
<td>1</td>
<td>75.2%</td>
<td>1</td>
<td>75.0%</td>
<td>1</td>
<td>75.0%</td>
<td>1</td>
<td>75.0%</td>
<td>1</td>
<td>75.0%</td>
</tr>
<tr>
<td>Addiction</td>
<td>2</td>
<td>63.5%</td>
<td>2</td>
<td>62.5%</td>
<td>2</td>
<td>62.5%</td>
<td>2</td>
<td>62.5%</td>
<td>2</td>
<td>62.5%</td>
</tr>
<tr>
<td>Health Care Access and Quality</td>
<td>3</td>
<td>50.1%</td>
<td>3 (tie)</td>
<td>50.0%</td>
<td>4</td>
<td>48.4%</td>
<td>4</td>
<td>48.4%</td>
<td>3</td>
<td>52.7%</td>
</tr>
<tr>
<td>Overweight and Obesity</td>
<td>4</td>
<td>48.4%</td>
<td>3 (tie)</td>
<td>48.4%</td>
<td>5</td>
<td>48.4%</td>
<td>3</td>
<td>48.4%</td>
<td>6 (tie)</td>
<td>48.4%</td>
</tr>
<tr>
<td>Drug and Alcohol Use</td>
<td>5</td>
<td>45.6%</td>
<td>5</td>
<td>45.6%</td>
<td>3</td>
<td>45.6%</td>
<td>5</td>
<td>45.6%</td>
<td>4</td>
<td>45.6%</td>
</tr>
<tr>
<td>Nutrition and Health Eating</td>
<td>6</td>
<td>38.3%</td>
<td>6 (tie)</td>
<td>38.3%</td>
<td>6 (tie)</td>
<td>38.3%</td>
<td>5</td>
<td>38.3%</td>
<td>5</td>
<td>38.3%</td>
</tr>
<tr>
<td>Older Adults</td>
<td>7 (tie)</td>
<td>32.5%</td>
<td>10</td>
<td>32.5%</td>
<td>8</td>
<td>32.5%</td>
<td>9</td>
<td>32.5%</td>
<td>6 (tie)</td>
<td>32.5%</td>
</tr>
<tr>
<td>Preventive Care</td>
<td>7 (tie)</td>
<td>32.5%</td>
<td>8</td>
<td>32.5%</td>
<td>10</td>
<td>32.5%</td>
<td>8</td>
<td>32.5%</td>
<td>8 (tie)</td>
<td>32.5%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>9</td>
<td>32.2%</td>
<td>11</td>
<td>32.2%</td>
<td>12 (tie)</td>
<td>32.2%</td>
<td>6 (tie)</td>
<td>32.2%</td>
<td>13</td>
<td>32.2%</td>
</tr>
<tr>
<td>Economic Stability</td>
<td>10</td>
<td>29.7%</td>
<td>6 (tie)</td>
<td>29.7%</td>
<td>9</td>
<td>29.7%</td>
<td>10</td>
<td>29.7%</td>
<td>11</td>
<td>29.7%</td>
</tr>
<tr>
<td>Transportation</td>
<td>11</td>
<td>26.3%</td>
<td>9</td>
<td>26.3%</td>
<td>7</td>
<td>26.3%</td>
<td>12</td>
<td>26.3%</td>
<td>17</td>
<td>26.3%</td>
</tr>
<tr>
<td>Cancer</td>
<td>12</td>
<td>25.3%</td>
<td>12</td>
<td>25.3%</td>
<td>12 (tie)</td>
<td>25.3%</td>
<td>11</td>
<td>25.3%</td>
<td>19</td>
<td>25.3%</td>
</tr>
<tr>
<td>Public Health</td>
<td>13</td>
<td>24.5%</td>
<td>14</td>
<td>24.5%</td>
<td>12 (tie)</td>
<td>24.5%</td>
<td>15</td>
<td>24.5%</td>
<td>10</td>
<td>24.5%</td>
</tr>
<tr>
<td>Housing and Homes</td>
<td>14</td>
<td>23.0%</td>
<td>15 (tie)</td>
<td>23.0%</td>
<td>11</td>
<td>23.0%</td>
<td>17</td>
<td>23.0%</td>
<td>8 (tie)</td>
<td>23.0%</td>
</tr>
<tr>
<td>Workforce</td>
<td>15</td>
<td>22.2%</td>
<td>13</td>
<td>22.2%</td>
<td>16</td>
<td>22.2%</td>
<td>21</td>
<td>22.2%</td>
<td>11</td>
<td>22.2%</td>
</tr>
<tr>
<td>Education Access and Quality</td>
<td>16</td>
<td>21.2%</td>
<td>20 (tie)</td>
<td>21.2%</td>
<td>15</td>
<td>21.2%</td>
<td>13</td>
<td>21.2%</td>
<td>15 (tie)</td>
<td>21.2%</td>
</tr>
<tr>
<td>Health Insurance</td>
<td>17</td>
<td>20.9%</td>
<td>17</td>
<td>20.9%</td>
<td>20 (tie)</td>
<td>20.9%</td>
<td>19</td>
<td>20.9%</td>
<td>15 (tie)</td>
<td>20.9%</td>
</tr>
<tr>
<td>Child and Adolescent Development</td>
<td>18</td>
<td>20.6%</td>
<td>23</td>
<td>20.6%</td>
<td>17 (tie)</td>
<td>20.6%</td>
<td>18</td>
<td>20.6%</td>
<td>18</td>
<td>20.6%</td>
</tr>
<tr>
<td>Hospital and Emergency Services</td>
<td>19</td>
<td>19.0%</td>
<td>19</td>
<td>19.0%</td>
<td>17 (tie)</td>
<td>19.0%</td>
<td>16</td>
<td>19.0%</td>
<td>20</td>
<td>19.0%</td>
</tr>
<tr>
<td>Chronic Pain</td>
<td>20</td>
<td>17.7%</td>
<td>20 (tie)</td>
<td>17.7%</td>
<td>34 (tie)</td>
<td>17.7%</td>
<td>24 (tie)</td>
<td>17.7%</td>
<td>14</td>
<td>17.7%</td>
</tr>
</tbody>
</table>

are rural, but almost all rural LHDs are small. Some rural jurisdictions lack an LHD, and are therefore served only by a regional or state health department. Rural LHDs strive to address rural communities’ disproportionately poor health outcomes, and limited health service access, despite understaffing and fewer resources than their suburban and urban peers. Rural challenges with health services access have often historically rendered, and continue to render, a need for LHDs to directly provide clinical services to their community members. For example, primary care and maternal and child health services are still frequently offered by rural and small health departments in the South. In many instances, these services would be otherwise unavailable due to shortages in the supply of primary care services. In fulfilling their assurance function this way, however, rural LHDs have less capacity to support population-focused activities than their urban peers. There is some evidence that this capacity continues
to decline. Between 2014 and 2018, the scope of the 20 recommended public health activities implemented declined 3.4 percentage points in rural areas, whereas it increased by 1.4 percentage points in urban settings. This set of 20 activities are those recommended by the Public Health Accreditation Board (PHAB), the U.S. Department of Health and Human Services (HHS), and the Institute of Medicine. Examples include assessments of community health needs and risks, planning and priority setting across sectors, engaging community members in selecting and implementing health strategies, and evaluating progress.

As summarized in Table 2, other works confirm LHDs serving smaller, often rural, populations tend to perform more poorly than their larger or urban counterparts on some or all of the three aforementioned core functions, and on the 10 essential public health services.

<table>
<thead>
<tr>
<th>Core Function</th>
<th>Essential Service</th>
<th>Number of studies indicating:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Small/Rural performs better</td>
<td>No large/significant difference</td>
<td>Large/Urban performs better</td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td>1. Monitor health status to identify and solve community health problems</td>
<td>0</td>
<td>2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Diagnose and investigate health problems and health hazards in the community</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Policy Development</td>
<td>3. Inform, educate, and empower people about health issues</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Mobilize community partnerships and action to identify and solve health problems</td>
<td>0</td>
<td>5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Develop policies and plans that support individual and community health efforts</td>
<td>0</td>
<td>5</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Assurance</td>
<td>6. Enforce laws and regulations that protect health and ensure safety</td>
<td>0</td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Assure competent public and personal health care workforce</td>
<td>1</td>
<td>8</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. Research new insights and innovative solutions to health problems</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
Small/rural LHDs are significantly less likely to report using evidence-based decision making, have lower compliance rates, and report applying fewer strategies to address health disparities than their larger/urban peers. The more rural an LHD’s state is, the less likely they are to exhibit policy behaviors at the local level (i.e., prepare issue briefs for policy makers, participate on a health policy board, testify publicly to policy makers, communicate with policy makers regarding proposed actions, and/or provide technical assistance to policy makers drafting proposed actions). Further, small/rural LHDs are significantly less likely to seek accreditation or be accredited than LHDs serving larger/urban communities. This is detrimental as accreditation offers an effective means for creating positive change in public health departments. The rural-urban accreditation disparity is another consequence of aforementioned challenges with financing and staffing in rural LHDs. The lack of rural LHD accreditation impacts rural LHD participation in Community Health Assessments (CHAs), and translation of CHA findings into Community Health Improvement Plans (CHIPs). This is because CHAs and CHIPs have been required components of the public health accreditation process since its inception in 2011.

Community health assessments are meant to guide the direction of a public health department’s efforts, and generally involve collecting and reporting information on various health indicators, while a CHIP operationalizes these priorities. The odds of urban LHDs conducting a CHA have increased since 2014 (OR of 1.79 in 2016, OR of 2.04 in 2018); however, the odds of rural LHDs conducting a CHA have decreased since that time (OR of 0.76 in 2014, OR of 0.74 in 2016, OR of 0.55 in 2018). Without the community-specific insights a CHA affords, it is a challenge for rural LHDs to know how best to allocate their very limited resources.

Previous works have highlighted the importance of tailored public health system improvement for rural communities. This chapter considers Healthy People 2030 Public Health Infrastructure objectives in the context of rural public health infrastructure. Particular salience to rural wellbeing was observed in the objectives related to financing (PHI-R08) and technology access (PHI-D05), accreditation (PHI-R01, PHI-R02, PHI-R03, PHI-R10), use of community health assessments and improvement plans (PHI-R04, PHI-R05, PHI-R08, PHI-R09), and workforce development (PHI-R02).

**FINANCING**

Healthy People 2030 objectives with salience to rural health by way of public health infrastructure financing include:

- Explore financing of the public health infrastructure (PHI-R08)
- Increase the proportion of state PH labs that use emerging technology to provide enhanced services (PHI-D05)

Funding for local health and social services is primarily a function of an area’s tax base, fiscal policies, and economic condition. Local health departments tend to perform better when they have greater total expenditures, greater expenditures per capita, and jurisdictions over 100,000 so as to benefit from economies of scale. Unfortunately, revenue streams differ significantly for rural LHDs relative to their larger counterparts (see Table 3).

The revenue stream challenges are compounding in nature as higher state and federal funding generally begets higher funding from local sources. Rural LHDs’ disproportionate reliance on limited federal, state, and clinical service revenues make it challenging to increase local revenues, and in turn make rural LHDs less financially equipped to meet local needs. Many rural communities face a low and declining tax base, as well as populations that are too small to reach economies of scale benefits. With respect to economies of scale challenges, the fixed costs for operating health departments of any size are considerable. The financial structures that create disadvantage for rural LHDs then may impede their ability to pay for basic infrastructure, sufficient staff, and/or fulfill their three core functions and the 10 essential public health services. This may also keep certain forms of public health technology out of reach for rural LHDs. Rural
LHDs often have limited access to electronic information, as well as software for transferring information, scheduling and monitoring patients, adopting social media, and developing educational content for patients and community members. Access to current information on evidence-based public health practices is also less likely to be held by smaller LHDs relative to their larger counterparts. Without sufficient information technology, rural LHD performance management and quality improvement can be undermined. In March 2022, the Rural Public Health Workforce Training Network (RPHWTN) Program commenced with the aim of investing in virtual and telehealth systems, and the electronic health record workforce. The impact of these investments in rural public health technology has yet to be assessed.

Table 3. Mean per capita spending in local health departments by rurality, 2008-2019.

<table>
<thead>
<tr>
<th>Population Served</th>
<th>Mean Per Capita Spending Range, $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
</tr>
<tr>
<td>&lt; 50,000</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>66 (64-68)</td>
</tr>
<tr>
<td>Urban</td>
<td>38 (36-40)</td>
</tr>
<tr>
<td>50,000 – 500,000</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>67 (64-70)</td>
</tr>
<tr>
<td>Urban</td>
<td>47 (46-48)</td>
</tr>
<tr>
<td>&gt; 500,000</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>52 (49-55)</td>
</tr>
</tbody>
</table>
unlikely. Intergovernmental transfers are one pathway federal and state governments can use to address differences in local-level resource availability. These constitute payments from one government to another, and can take the form of grants, or categorical support for specific areas or programs. For example, federal-level funds from the Centers for Disease Control and Prevention (CDC) can be transferred to states, and then to LHDs to invest in public health; or the Department of Housing and Urban Development’s federal dollars can be transferred to more local jurisdictions or community development departments to invest in housing. While intergovernmental transfers are a salient tool for overcoming the local revenue gap, these are not being widely allocated in a way that reflects this opportunity. Other works have highlighted the need to explore new mechanisms for allocating resources to communities such that rural–urban differences in fiscal capacity are minimized, and opportunities for collaboration are maximized.

**ACCREDITATION AND Core Competencies**

The financial underpinnings of rural public health also have implications for accreditation of rural public health entities. A majority (56%) of small LHDs (defined as those serving jurisdictions under 50,000) report limited funding or financial constraints as a challenge of accreditation, relative to 36% and 39% for medium and large health departments, respectively. Creating pathways to accreditation is consequential as accreditation acts as a vehicle for strengthening public health infrastructure, accountability, consistency, and aligning services with community needs. Evidence suggests that accredited public health departments are more likely to yield significant reductions in mortality and medical costs in traditionally underserved communities via more comprehensive public health systems. In a cross-sectional survey of 350 LHDs, approximately half of which were rural, accredited health departments were more likely to report higher capacity for evidence-based decision making, and for evaluation capacity, than health departments not yet pursuing accreditation. Other published works have found that small LHDs are particularly likely to report the accreditation process conferred improvements in staff competencies, partner relations, and capacity to provide high-quality services. For these and other reasons, nearly all (96%) small, accredited LHDs believe applying for national accreditation through the Public Health Accreditation Board (PHAB) was a favorable decision.

Healthy People 2030 objectives with salience to rural public health by way of accreditation include:

- Increase the proportion of accredited state (PHI-R01), local (PHI-R02), tribal (PHI-R03), and territorial (PHI-D05) public health agencies
- Explore the impact of public health accreditation and national standards (PHI-R10)
- Increase the proportion of local public health agencies that use core competencies in continuing education (PHI-07)

The PHAB was established in 2007 to implement and oversee voluntary public health accreditation within the U.S. This voluntary process was launched in 2011, and calls for a review of health departments’ performance against national standards. The aim of accreditation is to systematically improve public health processes and outcomes. Accreditation requires health departments to demonstrate that they meet specific criteria (e.g., analysis and monitoring of trends, review of laws, development of policy and advocacy efforts, and demonstration of partnerships).

As of 2022, 306 LHDs have been accredited. This constitutes a minority of LHDs: as of 2019, 16% of LHDs were accredited, 5% had applied, and 2% had registered an intent to apply. Previous research has found that the strongest predictor for seeking PHAB accreditation is the urbanicity/rurality of an LHD’s jurisdiction. The LHDs in urban settings (jurisdictions of 50,000 or more) were 16.6 times more likely, and micropolitan LHDs (jurisdictions of 10,000 - 49,999) were 3.4 times more likely to seek PHAB accreditation than rural LHDs (those with jurisdictions under 10,000). Frequently cited reasons for small or rural LHDs
not applying for accreditation include: insufficient finances, insufficient staff time, insufficient technical support, and high staff turnover.\textsuperscript{7,8,21,33}

The inclusion of core competencies for training and education needs of LHDs are key to the accreditation process.\textsuperscript{34} The Council on Linkages Between Academia and Public Health Practices created 56 core competencies that fall into eight domains. These domains include: (1) Data Analytics and Assessment Skills, (2) Policy Development and Program Planning Skills, (3) Communication Skills, (4) Health Equity Skills, (5) Community Partnership Skills, (6) Public Health Sciences Skills, (7) Management and Finance Skills, and (8) Leadership and Systems Thinking Skills.\textsuperscript{35} Very few studies have examined the extent to which competency attainment occurs at the same or varying levels among rural and urban public health professionals. Most studies examining competency attainment among LHD employees have focused on large and medium-sized departments, while capacity and skills assessments among rural LHD employees remain understudied.\textsuperscript{36,37}

A recent study by Kett and colleagues, summarized graphically in Figures 1 and 2, set out to explore training needs and comfort with competencies among rural and urban LHD employees.\textsuperscript{38} Despite limited workforce capacity, limited investments in infrastructure and training, and dependence on an area's tax base for funding, rural LHD staff had higher odds of reporting proficiencies in systems and strategic thinking, cross-sectoral partnerships, and community engagement.\textsuperscript{38} Importantly, critical training needs in using data to inform decision making (tied to the Data Analytics and Assessment Skills domain) and in diversity, equity and inclusion (the Health Equity Skills domain) were noted.\textsuperscript{38} Other competencies for which rural public health staff were less likely to indicate proficiencies included: identifying and ensuring the use of appropriate sources of data, identifying or applying evidence-based approaches, describing how social determinants of health impact health, targeting communications effectively, describing relationships between policies and public health problems, and determining the feasibility of a policy.\textsuperscript{36,37} These needs and competencies are critical to addressing mistrust in the government, science, and public health interventions among rural communities.\textsuperscript{39} Previous work has noted the importance of including residents from historically marginalized groups in all efforts to enhance the credibility of public health work, interventions, and infrastructure.\textsuperscript{39}

Given accreditation’s crucial benefits, creating a more equitable landscape across LHDs will require that even small and rural LHDs develop the capacity to meet accreditation performance standards.\textsuperscript{35} In addition to the previously stated need for improved funding, rural LHDs will also need to receive clear messaging around accreditation’s benefits, as well as additional technical support to achieve accreditation.\textsuperscript{7} Requirements that reaccreditation be sought every five years\textsuperscript{31} create a means for rural LHDs to continue to evolve with the changing needs and capabilities of the public health field. Accreditation and subsequent reaccreditation is a meaningful pathway to advance rural public health infrastructure. However, making use of this opportunity will require connecting rural LHDs to the necessary supports.

**COMMUNITY HEALTH ASSESSMENTS & IMPROVEMENT PLANS**

Accreditation has also acted as a catalyst for the uptake of CHAs, CHIPs, community engagement in planning, partnership formation, and evaluation of department services.\textsuperscript{31} The efficiency and responsiveness of rural public health actors is contingent on their sense of community needs and priorities, and the presence of strategies and partnerships to fulfill these. The CHAs offer insight into the former, while CHIPs guide the latter. Recognizing how foundational these are to improving community wellbeing, the PHAB designated CHA and CHIP submissions as two of the three prerequisites within the original 2011 voluntary accreditation process.\textsuperscript{10} Healthy People 2030 objectives with salience to rural public health by way of CHA and CHIP participation include:

- Increase the proportion of tribal (PHI-08), local (PHI-05), state and territorial (PHI-04) jurisdictions that have a health improvement plan
Figure 1. Rural vs Urban Skill Proficiency Among Non-supervisors and Supervisors/Executives in Local Health Departments by Tier 1 Skill Proficiency: United States, 2021

Data-Based Decision Making
- Collect or use valid data
- Identify and ensure use of appropriate sources of data
- Identify or apply evidence-based approaches

Justice, Equity, Diversity, and Inclusion
- Describe the value or support the development of a diverse workforce
- Support inclusion of/HIE and SI principles
- Deliver/Ensure implementation of socially, culturally, and linguistically appropriate programs

Systems and Strategic Thinking
- Describe how SDOH impacts health and build cross-sector partnerships to address SDOH
- Describe your agency’s strategic priorities/Implement strategic plan
- Participate in/Apply QI processes

Effective Communication
- Communicate persuasively
- Effectively target communications

Change Management
- Assess influential external drivers
- Describe the influence of internal changes/Modify programs based on internal changes

Community Engagement
- Describe your role in improving community health/Assess and advocate for needed policies and programs
- Describe the value of community strategic planning/Apply findings from CHA
- Describe the importance of engaging/Engage community members in program design/implementation

Policy Engagement
- Describe relationships between policies and public health problems/Determine the feasibility of a policy
- Collect information to inform/Identify and influence policy which affects community health

Budget and Financial Management
- Describe/Apply financial analysis methods for program and service delivery
- Describe the value of/Implement an agency business plan
- Describe/Identify and leverage public health funding mechanisms to support agency programs

Cross-Sectoral Partnerships
- Collaborate with public health personnel across the agency/across public health systems
- Engage community assets/Identify community assets to improve health in a community

0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5
Adjusted Odds Ratio
Figure 2. Rural vs Urban Skill Proficiency Among Non-supervisors and Supervisors/Executives in Local Health Departments by Tier 2/3 Skill Proficiency: United States, 2021

<table>
<thead>
<tr>
<th>Data-Based Decision Making</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Collect or use valid data</td>
</tr>
<tr>
<td>• Identify and ensure use of appropriate sources of data</td>
</tr>
<tr>
<td>• Identify or apply evidence-based approaches</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Justice, Equity, Diversity, and Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describe the value or support the development of a diverse workforce</td>
</tr>
<tr>
<td>• Support inclusion of incorporate HE and SJ principles</td>
</tr>
<tr>
<td>• Deliver/Ensure implementation of socially, culturally, and linguistically appropriate programs</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Systems and Strategic Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describe how SDOH impacts health and build cross-sector partnerships to address SDOH</td>
</tr>
<tr>
<td>• Describe your agency’s strategic priorities/Implement strategic plan</td>
</tr>
<tr>
<td>• Participate in/Apply QI processes</td>
</tr>
<tr>
<td>• Integrate current trends into strategic plans</td>
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<thead>
<tr>
<th>Effective Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Communicate persuasively</td>
</tr>
<tr>
<td>• Effectively target communications</td>
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<tr>
<th>Change Management</th>
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<tbody>
<tr>
<td>• Assess influential external drivers</td>
</tr>
<tr>
<td>• Describe the influence of internal changes/Modify programs based on internal changes</td>
</tr>
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<table>
<thead>
<tr>
<th>Community Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describe your role in improving community health/Assess and advocate for needed policies and programs</td>
</tr>
<tr>
<td>• Describe the value of community strategic planning/Apply findings from CHA</td>
</tr>
<tr>
<td>• Describe the importance of engaging/Engage community members in program design/implementation</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Policy Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describe relationships between policies and public health problems/Determine the feasibility of a policy</td>
</tr>
<tr>
<td>• Collect information to inform/Identify and influence policy which affects community health</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Budget and Financial Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describe/Apply financial analysis methods for program and service delivery</td>
</tr>
<tr>
<td>• Describe the value of/Implement an agency business plan</td>
</tr>
<tr>
<td>• Describe/Identify and leverage public health funding mechanisms to support agency programs</td>
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<tr>
<th>Cross-Sectoral Partnerships</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Collaborate with public health personnel across the agency/across public health systems</td>
</tr>
<tr>
<td>• Engage community assets/Identify community assets to improve health in a community</td>
</tr>
</tbody>
</table>

Adjusted Odds Ratio
• Explore the impact of community health assessment and improvement planning efforts (PHI-R09)

The proportion of LHDs conducting CHAs and CHIPs has increased over time: from 61% and 50%, respectively, in 2010, to 78% and 67%, respectively, in 2016.\textsuperscript{17} Completing the required CHA, an accompanying CHIP, and departmental strategic plan is significantly associated with an increased likelihood of performing activities to overcome health disparities.\textsuperscript{31,40,41} Despite these benefits, conducting CHAs and CHIPs has been more challenging for rural LHDs. A minority (39%) of LHDs serving jurisdictions with populations under 50,000 had conducted a CHA in the previous five years,\textsuperscript{11} and the odds of rural LHDs conducting a CHA have decreased over time (OR of 0.76 in 2014, OR of 0.74 in 2016, OR of 0.55 in 2018) relative to urban LHDs (see Table 4).\textsuperscript{12} Jurisdictional size has also been associated with how an LHD approaches CHIP development.\textsuperscript{12}

Cross-sectoral partnerships are required in the accreditation standards related to the CHA and CHIP.\textsuperscript{10} In this way, CHAs and CHIPs also act as conduits for establishing community partnerships. Collaboration between health departments and other community groups for CHA purposes bolsters CHA-CHIP completion,\textsuperscript{15} ensures that a local public health system is in place,\textsuperscript{44} and allows partners to accomplish mutual goals.\textsuperscript{45} The CHA-CHIP processes have been shown to involve a wider array of partners than may be typical in other types of LHD partnerships.\textsuperscript{10,46} For example, law enforcement partnerships were listed in a majority (59%) of the CHA-CHIPs representing small jurisdictions in the previous five years,\textsuperscript{11} and the odds of rural LHDs conducting a CHA have decreased over time (OR of 0.76 in 2014, OR of 0.74 in 2016, OR of 0.55 in 2018) relative to urban LHDs (see Table 4).\textsuperscript{12}

Table 4. Changes over time in public health activities by rurality: United States, 2014-2018.\textsuperscript{12}

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conducted Community Needs Assessment (n = 1,658) OR (95% CI)</th>
<th>Identified Community Health Priorities (n = 1,658) OR (95% CI)</th>
<th>Developed Community Health Action Plan (n = 1,658) OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rurality and period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban 2014 (Reference)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Urban 2016</td>
<td>1.79 (0.95, 3.34)</td>
<td>1.33 (0.75, 2.38)</td>
<td>1.00 (0.63, 1.58)</td>
</tr>
<tr>
<td>Urban 2018</td>
<td>2.04 (1.03, 4.05)</td>
<td>1.42 (0.75, 2.71)</td>
<td>1.38 (0.83, 2.30)</td>
</tr>
<tr>
<td>Rural 2014</td>
<td>0.76 (0.33, 1.74)</td>
<td>0.57 (0.26, 1.24)</td>
<td>0.83 (0.43, 1.60)</td>
</tr>
<tr>
<td>Rural 2016</td>
<td>0.74 (0.32, 1.68)</td>
<td>0.54 (0.24, 1.20)</td>
<td>0.56 (0.29, 1.10)</td>
</tr>
<tr>
<td>Rural 2018</td>
<td>0.55 (0.23, 1.34)</td>
<td>0.28 (0.12, 0.65)</td>
<td>0.56 (0.28, 1.15)</td>
</tr>
<tr>
<td>Poverty Rate (%)</td>
<td>0.91 (0.86, 0.98)</td>
<td>0.95 (0.89, 1.01)</td>
<td>0.96 (0.91, 1.02)</td>
</tr>
<tr>
<td>Populations of Color (%)</td>
<td>0.99 (0.97, 1.00)</td>
<td>0.99 (0.97, 1.01)</td>
<td>1.00 (0.98, 1.01)</td>
</tr>
<tr>
<td>Population Older than 65 (%)</td>
<td>0.94 (0.88, 1.00)</td>
<td>0.96 (0.93, 1.06)</td>
<td>0.98 (0.93, 1.03)</td>
</tr>
<tr>
<td>Uninsured rate (%)</td>
<td>1.03 (0.96, 1.10)</td>
<td>0.99 (0.93, 1.06)</td>
<td>1.00 (0.95, 1.05)</td>
</tr>
<tr>
<td>Income per capita ($10,000)</td>
<td>0.91 (0.72, 1.15)</td>
<td>0.91 (0.75, 1.11)</td>
<td>0.94 (0.79, 1.11)</td>
</tr>
<tr>
<td>Unemployment rate (%)</td>
<td>1.23 (1.01, 1.50)</td>
<td>1.14 (0.95, 1.37)</td>
<td>1.08 (0.94, 1.24)</td>
</tr>
<tr>
<td>4-year college degree (%)</td>
<td>0.98 (0.95, 1.02)</td>
<td>0.99 (0.96, 1.02)</td>
<td>1.00 (0.97, 1.02)</td>
</tr>
<tr>
<td>Multicounty</td>
<td>1.47 (0.70, 3.05)</td>
<td>1.55 (0.79, 3.03)</td>
<td>0.90 (0.51, 1.58)</td>
</tr>
</tbody>
</table>

While partnerships can benefit LHDs of any size, prior research indicates that partnerships may
play a particularly important role in helping small or rural LHDs offset capacity limitations, and bring accreditation (including related CHA and CHIP requirements) within reach. Facilitators identified for the CHA-CHIP process in rural counties include a functioning 501(c)(3) community health coalition, and perceived self-efficacy. Even if these facilitators are present, and additional necessary supports are provided to rural LHDs, those constrained by limited staff are unlikely to develop the capacity needed to effectively support the CHA-CHIP process.

WORKFORCE

Effective fulfillment of CHAs, CHIPS, and other core functions of LHDs are contingent upon sufficient workforce in rural public health. While workforce challenges in rural public health are longstanding, these have intensified amidst the COVID-19 pandemic. Creating pipelines in which emerging professionals and practitioners learn, work, and live in rural contexts may well be crucial to recruiting and retaining workers sufficient in volume and competency. Healthy People 2030 objectives with salience to rural public health by way of workforce development include:

- Expand public health pipeline programs that include service or experiential learning (PHI-R02)

Small/rural health departments employ comparatively fewer full-time employees than do large/urban departments. The 1,500 smallest and most rural LHDs have fewer staff than the 25 largest urban LHDs combined. These realities yield a narrower range of public health skills in rural LHDs. Budget constraints also shape the type of positions and professionals LHDs hire; that is, jurisdictions serving fewer than 100,000 residents are increasingly served by a part-time workforce, and by LHDs with nursing professionals rather than MD professionals in their executive roles. Remote geographic locations and less than competitive pay scales result in greater challenges for small/rural LHDs to recruit and retain leadership, nurses, and other allied health professionals. For example, nurses could earn $15,000 more annually for a parallel position in a private health care setting relative to one in an LHD. Clinical service roles are particularly essential in rural LHDs as these often act as clinical care safety nets for their respective communities.

To compensate for recruitment and retention challenges, rural LHDs often reduce position qualification requirements. However, this approach contributes to great variation in personnel capacity across jurisdictions. Prior works have found that rural LHD staff have minimal incentive to continue their education, and LHDs in rural jurisdictions were much less likely than those in urban jurisdictions to have a continuing education budget. Executives from rural LHDs frequently report difficulty accessing trainings on health disparities. Taken together, these factors impede the ability of rural LHD professionals to expand their ability to meet the needs of their community in an equitable way.

PHAB accreditation also requires evidence of LHD efforts to recruit a workforce that is representative of the population served, to maintain procedures for health equity-centric interventions, and to train staff on cultural competency. Understanding the community-specific context rural public health workers are operating in can be furthered by experiential learning. Rural professional experience placements for students can be an influential mechanism for addressing workforce shortages in rural health facilities by immersing students within real-world service environments, and promoting rural facilities as potential employers.

Developing a rural public health workforce that is well trained in both the public health discipline, and in the nuanced needs of an individual rural community will require both financial investment and strategic action. Strategies for consideration include: loan repayment and tax incentive programs, developing more partnerships across sectors and neighboring agencies, exploring formal and informal cross-jurisdictional sharing, and increasing access to continuing education opportunities. Regionalization (combining small, adjacent jurisdictions) has also been considered as a pathway to increase the capacity of rural LHDs. However, the heterogeneity of communities in size, circumstance, and priorities could impede the performance of entities attempting to serve multiple jurisdictions. Accordingly, this recommendation should be undertaken with caution.
The 2022 RPHWTN Program’s investments aimed to cross-train community health workers and case management staff, and increase the number of both rural community paramedics and health care providers. Other federal awards for resilience and mental health training programs have been made to mitigate rural and underserved healthcare worker burnout since the COVID-19 pandemic. The impact of these investments in the rural public health workforce has yet to be assessed. The COVID-19 pandemic was a catalyst for exploring telehealth as a vehicle for reducing rural public health workforce challenges by creating new remote access to certain services. However, initial barriers inherent to this strategy include limited rural broadband access, and rural patient preferences for in-person services.

**SUMMARY AND CONCLUSIONS**

Attunement to the needs and preferences of the community one aims to serve is central to the public health approach. This applies to access to services, and all other public health challenges rural LHDs confront. Placing select Healthy People 2030 objectives in the context of the current rural public health landscape better positions the field to make equitable progress. The rural public health infrastructure remains under-resourced. Rural areas have not experienced the public sector investments, workforce investments, nor economic recovery held commonly by urban peers since the Great Recession.

Overcoming challenges with financial reliance on declining state and federal funding would minimize capacity challenges that impede accreditation, participation in the CHA-CHIP process, and workforce recruitment, retention, and development in rural public health. Positioning rural public health actors to engage successfully with each of these activities stands to advance health equity, and reduce morbidity, mortality, and costs. Literature suggests financial collaborations like cross-jurisdictional sharing arrangements, in which resources are pooled across neighboring communities, and operational collaborations with community partners, may be crucial in expanding rural public health capacity. Despite the challenges in rural public health, rural communities boast certain social and structural conditions that are protective for community health and wellbeing, such as social connectedness and self-reliance. Said strengths lay a promising foundation for effective partnerships and tailored solutions within rural public health.

**REFERENCES**


doi:10.1097/PHH.0b013e3182294e66


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**Related Chapters:**
- Chapter 3. Rural Healthcare Access and Quality
- Chapter 15. An Examination of the Workforce in Rural America

**Suggested Chapter Citation:**
HOUSING AND HOMES: IMPLICATIONS FOR RURAL AMERICANS’ HOUSING CONDITIONS, MENTAL HEALTH OUTCOMES, AND OVERALL WELL-BEING

By Alva O. Ferdinand, DrPH, JD and Emesomhi Eboreime, MPH

SCOPE OF THE PROBLEM

• For the first time in the history of the U.S. Department of Health and Human Services' Healthy People initiative, specific objectives tied to reducing health and safety risks in homes have been established.1

• In the Rural Healthy People 2030 national survey, rural stakeholders ranked “Housing and Homes” as the 14th most important health priority for rural Americans in the upcoming decade.2,3

• While homeownership has historically been higher among rural residents in the U.S., the structures that they own tend to be older, more expensive to heat and cool,4,5 and may contain lead, which is especially concerning for the health and development of rural children.6

• Homelessness among rural residents is difficult to accurately capture in terms of proportionality due to the phenomenon being less visible than it is in urban contexts.7,8

Housing and home environments have direct and indirect implications for individual and population health.9,10 Housing is a key social determinant of health, with poor housing found to be associated with diseases such as typhoid, pneumonia, cholera, depressive symptoms, fair overall health, and increased mortality.11,12 It is now more broadly appreciated that the quality of one’s dwelling is closely linked to physical and mental wellbeing.11 This is not only true for unstably housed adults, but for infants,9 children,12 youth,11 and the elderly11 as well. While the social determinants of health (SDoHs) were included in in the U.S. Department of Health and Human Services’ (HHS) last iteration of Healthy People (Healthy People 2020), they were primarily focused on economic stability, education, neighborhood and built environments, as well as social and community contexts.15 In that iteration, housing cost burdens were the only objective closely tied to the realities of housing affordability and experiences.15

In Healthy People 2030, HHS included a goal of promoting healthy and safe home environments for the first time.1 This represents a more in-depth and targeted look at a critical determinant of health – one that many researchers in the U.S. have been examining with greater intensity over the last decade. Importantly however, a large proportion of the research done on the associations between housing and health in the U.S. have been centered in urban contexts with fewer studies comparing or focusing on these associations in rural environments.11

HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

In this iteration of Healthy People, HHS included a specific focus on decreasing safety and health risks that occur in homes, with an overarching goal to “promote healthy and safe home environments.”1 This goal became particularly salient with the emergence of the COVID-19 pandemic as lockdowns and stay-at-home orders were employed by local and state governments in the quest to halt the rapid spread of the disease. During the pandemic, many U.S. residents had to do a lot more from home than they previously did, including working. According to results of the American Time Use Survey, the share of employed individuals who spent time working at home decreased marginally from 38% in 2021 to 34% in 2022.16 Nevertheless, the percentage of individuals
working from home in 2022 was still much higher than it was in 2019 (pre-pandemic). Access to safe, healthy, and stable housing is critical because of the profound impact it has on physical and mental health in children, adults, and the elderly. Healthy People 2030 included seven core objectives that are tied to housing and homes issues. In this chapter, progress towards five of those objectives will be discussed. These objectives are grouped into four categories below: housing and homes in general, mental health and mental disorders, people with disabilities, and tobacco use.

1. Housing and Homes – General
   - Reduce blood lead levels in children aged 1 to 5 years old – EH-04
   - Reduce the proportion of families that spend more than 30 percent of income on housing – SDOH-04

2. Mental Health and Mental Disorders
   - Increase the proportion of homeless adults with mental health problems who get mental health services – MHMD-R01

3. People with Disabilities
   - Reduce the proportion of people with intellectual and developmental disabilities who live in institutional settings with 7 or more people – DH-03

4. Tobacco Use
   - Increase the number of states, territories, and D.C. that prohibit smoking in multiunit housing – TU-R01

RURAL HEALTHY PEOPLE 2030 SURVEY

In the survey conducted by the Southwest Rural Health Research Center at the Texas A&M University School of Public Health to gauge population health priorities for rural America, “Housing and Homes” was deemed to be a top 20 priority health topic among stakeholders across all census regions. Overall, the health topic of Housing and Homes ranked 14th among priority areas for the current decade. Importantly, the placement of Housing and Homes among the top 20 priority areas varied by census region. Specifically, survey respondents from the West and the Northeast ranked Housing and Homes as the 8th and 11th priority areas respectively, while respondents from the Midwest and South ranked the same topic as 15th and 17th, respectively. When looking at the responses of stakeholders in states that expanded Medicaid and states that did not, there was no ranking variation for housing and homes. Nevertheless, there were slight variations in the ranking of housing and homes by field of employment, with Human Services personnel ranking it as the 5th top priority, while personnel employed in agriculture (25th), health care (19th), and business management/administration (14th) ranked it as a lower priority. In terms of work settings, respondents employed within Federally Qualified Health Centers (FQHCs) (9th) and rural public health agencies (9th) ranked housing and homes as a higher priority than those employed at critical access hospitals (20th), rural health clinics (27th), and rural hospitals (17th).

PREVALENCE AND DISPARITIES IN RURAL AREAS

Housing Affordability and Insecurity

The survey upon which this publication is based was disseminated at an unprecedented time in U.S. history with respect to housing. At the time of this writing, the U.S. Department of Agriculture (USDA), which provides competitively priced mortgage options to those living in designated rural areas, had a loan rate of 7.644% for a 30-year fixed loan and a 30-year refinance rate of 7.573%. These rates are in stark contrast to those announced by the USDA on August 30, 2016. In that year, the USDA reduced the interest rate for home mortgages to 2.875%. This considerable rise in interest rates over the last decade has significantly contributed to challenges to housing affordability and increases in housing insecurity.

Housing insecurity has been defined by the U.S. Department of Housing and Urban Development as encompassing several dimensions of housing problems that people may experience, including steep housing costs in proportion to income, overcrowding, unstable neighborhoods, substandard housing, or loss of housing.

One of the goals tied to housing and homes over the next decade is to reduce the proportion of families that spend more than 30% of
their household income on a dwelling place. Achievement of this goal would significantly improve housing security and stability for both urban and rural residents in the U.S. Moreover, it would contribute to overall health and wellness. Previous researchers have noted that the affordability and condition, as well as access to housing all contribute to health and well-being.\textsuperscript{9,11}

**Variations in Housing Cost Burdens for Rural and Urban Americans**

**Rural Rental Housing.** According to a 2016 report by the Joint Center for Housing Studies of Harvard University, housing costs that exceed 30\% of gross household income – which is deemed as unaffordable – are a reality for 41\% of all rural renters.\textsuperscript{21} In the same report, it was noted that 21\% of these renters are considered severely cost burdened, spending over 50\% of their gross household income on housing.\textsuperscript{21} Thus, while cost burdens are often discussed and examined in the urban context, a sizeable proportion of rural residents face these affordability challenges each year.

In a study published in 2020 by researchers at the University of Georgia, the cost burden of rural rental housing was further explored.\textsuperscript{4} In this study, the authors sought to critically examine utility costs and their contribution to overall rental housing burdens among rural Americans.\textsuperscript{4} More specifically, the authors argued that simply calculating mortgage or rent payment in determining housing cost burden is not reflective of total housing costs.\textsuperscript{4} Instead, they suggested that recurring costs of occupying housing units should also be included, as the costs of cooling, heating, and other energy costs have steadily increased over time.\textsuperscript{4,5} In this quantitative study, the authors found that utilities constitute a large share of housing costs burdens for rural residents, particular rural residents who rent.\textsuperscript{4} They found that the share of overall household income that goes toward utilities is more likely to drive rural renters over the 30\% threshold.\textsuperscript{4}

Critically, the Joint Center for Housing Studies of Harvard University found that renter cost burdens were not evenly distributed across race/ethnicity, with higher severe burdens borne by those identifying as Black, Hispanic, Asian, or ‘Other’ and higher moderate burdens for these subpopulations as well.\textsuperscript{22} These variations are depicted in Figure 1.

![Figure 1. Renter Cost Burden by Race and Ethnicity, 2017](https://www.jchs.harvard.edu/ARH_2017_cost_burdens_by_race)

**Notes:** Moderately cost-burdened households pay 30-50\% of income on housing. Severely cost-burdened households pay more than 50\% of income on housing.

Demographic and economic differences in cost of living are thought to be a reflection of variations in the types of jobs that urban and rural Americans work, educational attainment levels, racial and ethnic makeup, transportation time and costs, as well as overall levels of poverty and affluence. In a study published by Pacas and Rothwell in 2020, it was noted that there are significant differences in housing costs not only between states, but within states as well, particularly when looking at metropolitan and nonmetropolitan counties.

Social scientists have long recognized that poverty in the U.S. has tended to be clustered in rural parts of the country, specifically in Native American lands, Appalachia, the Southern “Black Belt,” the Mississippi Delta, and the Rio Grande Valley.

**Rural Home Ownership**

According to the U.S. Census Bureau, home ownership is higher in rural areas than it is in urban areas. This holds true across all census regions with the most notable difference between urban and rural homeownership rates in the Northeast (83.8% versus 58.2%). Approximately 16.5 million occupied homes in rural America are owner-occupied. This represents 71.4% of occupied homes. Figure 2 shows a well-established trend of higher homeownership among rural residents of the U.S. relative to urban residents. Notably however, homeownership primarily trended downwards between 2010 and 2018 with factors such as the Great Recession playing a role in the decline. Modest improvements in homeownership rates started to occur in 2016. Nevertheless, many rural individuals and families still face challenges obtaining affordable housing and owning their homes.

Despite these higher trends of homeownership and owner-occupied residences in rural America, the distribution of these trends is not equal when demographic factors such as race and ethnicity are considered. According to the Housing Assistance Council (HAC), White, non-Hispanic rural residents have higher ownership rates (75%) than their minority counterparts (55%). Home ownership rates for various races and Hispanic ethnicity are depicted in Figure 3.

**MENTAL HEALTH PROBLEMS AND MENTAL HEALTH SERVICES**

**Homeless Adults with Mental Health Problems**

Homeless individuals experience health problems similar to those faced by individuals who are housing secure. However, poor mental health is often notably more prominent among those

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**Figure 2: Homeownership Rates by Residence, 2010 – 2018**

that are homeless.\textsuperscript{28} Previous research has noted that access to safe, affordable housing combined with robust and consistent support services that assist the homeless in acquiring housing and remaining housed are critical in meeting the needs of homeless individuals who live with mental illnesses.\textsuperscript{28,29} Although homelessness is generally thought to be an urban dilemma, rural homelessness is a very real and growing problem as well. According to a national poll conducted by National Public Radio (NPR), the Robert Wood Johnson Foundation, and the Harvard T. H. Chan School of Public Health in 2019, one-third of rural Americans expressed that homelessness is a problem in their community.\textsuperscript{30} Notably, it is largely thought that estimates of the rural homeless are undercounted,\textsuperscript{28} as it is common for the rural homeless to be in out-of-sight locations such as forest campgrounds, desert canyons, and mountain hollows and therefore not detected.\textsuperscript{31}

Previous qualitative research has noted a strong disinclination on the part of those experiencing homelessness in rural areas to move away from their places of origin.\textsuperscript{32} This is because social connectivity and support networks remain critical despite the experience of homelessness.\textsuperscript{32} For this reason, it is very important that efforts to combat rural homelessness and housing insecurity be centered around local infrastructure and capacity.

### Housing and Mental Health Problems – Implications for Children

The relationship between health and poverty among rural children has largely been understudied. Researchers have noted that rural children experience significant limitations in terms of accessing primary and specialty care due to geographical and transportation-related barriers, as well as an inadequate number of health care providers.\textsuperscript{7} Mental, behavioral, and developmental disorders typically originate in early childhood and can have lifelong health and well-being implications.\textsuperscript{33}

A 2017 study using the National Survey of Children’s Health (NSCH) showed that a higher percentage of children residing in rural areas had parents who reported having financial difficulties that impacted their ability to meet basic needs such as housing.\textsuperscript{33} Additionally, the

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**Figure 3: Rural and Small Town Home Ownership By Race/Ethnicity**\textsuperscript{27}

study indicated that children in rural areas were more likely to report living in a neighborhood in poor conditions that lacked amenities than urban children. Importantly, after adjusting for poverty among children with mental, behavioral, and developmental disorders as well as race and ethnicity, the study showed that children in rural areas more often had a parent living with poor mental health.

LEAD EXPOSURE IN HOUSING

Lead exposure in U.S. housing continues to exist despite the residential use of lead-based paint being banned in 1978. According to findings from the American Healthy Homes Survey II (AHHS II) which were released in October 2021, 34.6 million homes (29.4% of all housing units) still contain lead-based paint. This survey was conducted by the U.S. Department of Housing and Urban Development’s Office of Lead Hazard Control and Healthy Homes. The AHHS II also revealed that 21.9 million homes (18.6%) have dust lead hazards, 18.2 million (15.4%) have substantially deteriorated lead-based paint, and 2.5 million homes (2.0%) have soil lead hazards. The survey’s findings are important because lead exposure has been found to be associated with growth delays, brain damage, as well as learning and behavioral issues, among other health challenges.

Lead exposure in children is particularly problematic because it often goes undetected due to a lack of immediate symptoms. The AHHS II noted that housing units in urban areas are more likely to have lead-based paint than rural housing units. Nevertheless, the burden of lead exposure among rural children is important to explore as opportunities for detection and treatment are limited. Researchers have noted that there is a paucity of literature on elevated blood lead levels among rural children. In a study examining elevated blood lead levels in rural and urban newborns in Iowa, it was shown that elevated blood lead in newborns was associated with residence in areas with pre-1940s housing, as well as women with low educational status in both urban and rural settings. Though no differences were detected in terms of the proportion of children with elevated blood levels, a spatial cluster of elevated blood lead was found in rural counties in the study. The authors concluded that though the density of children exposed to lead is lower in rural areas than it is in urban areas, the potential for exposure is still high for rural children.

Another study published in 2022 assessed neighborhood poverty, older housing and their associations with adverse birth outcomes in Texas. The authors specifically operationalized older housing as that built before 1975 because they were constructed before the lead-based paint ban. The researchers linked population-level birth certificate data for White, Black, Hispanic, and ‘Other’ women in Texas to tract-level median housing age and poverty level from the American Community Survey. Children were more likely to be born under adverse birth circumstances (e.g. being small-for-gestational age, having low birth weight, or being born before full term) when their mothers lived in high-poverty neighborhoods with housing built before the lead-based paint ban.

SMOKING PROHIBITIONS IN MULTIUNIT HOUSING

Despite overall downward trends in cigarette smoking in the U.S., it continues to be the leading cause of preventable disease, disability and death. Researchers have noted that cigarette smoking is more prevalent among rural residents than it is among urban residents, with this disparity having increased over time. Using data from the National Survey on Drug Use and Health (NSDUH) from 2010 – 2020, researchers explored trends in cigarette smoking and quit ratios for those aged 18 and older in rural and urban settings. The researchers found that in 2020, smoking prevalence was significantly higher in rural areas than in urban areas, but that quit ratios were similar along the urban-rural continuum. Additionally, over the study period, the likelihood of quitting was lower in rural areas than it was in urban areas despite quit ratios increasing over time.

The aforementioned information is contextually important for understanding how smoke-free policies have been differentially impactful between rural and urban residents. In a study published in the American Journal of Public Health in 2019, the authors set out to explore access to smoke-free laws and policies and uneven
adoption of the policies in single-family and multiunit housing in rural regions by thoroughly examining the literature published on this topic through 2018. Importantly, the authors noted that subpopulations that have disproportionately borne the undesirable consequences of tobacco use have historically been rural residents, those living with low incomes, and people with mental health or substance use disorders, among others. Notably, strong smoke-free laws have not been robustly passed in rural regions due to political resistance to tobacco-control policies and because of alliances between manufacturers and farmers. This is especially true in the South. Nevertheless, the authors found that multiunit residents in both rural and urban settings expressed strong support for smoke-free public housing. Smoke-free multiunit housing would particularly lower exposure to second-hand smoke for individuals who live in these settings and do not smoke.

OTHER FACTORS RELEVANT TO HOUSING AND HOMES

Housing Conditions

There is an established relationship between poverty and housing conditions. Results from the 2019 American Community Survey (ACS) indicate that the rural poverty rate was 15.4% in 2019, whereas the urban poverty rate was 11.9%. According to the Economic Research Service (ERS) of the USDA, “concentrated poverty contributes to poor housing and health conditions.” The ERS has further stated that more than 85% of the 353 persistently poor counties in the U.S. can be found in rural areas. Notably, over 80% of counties identified in persistent poverty by the U.S. Census Bureau are located in the South. Moreover, though housing may be less expensive in rural areas than in urban ones, the quality of housing may be particularly lower due to a higher rate of substandard housing units. According to the Urban Institute, rural dwellings are generally older than average, with upwards of 6.7 million rural households lacking either complete kitchen facilities or complete plumbing. This is of particular concern for rural adults, who tend to favor aging in place more so than urban adults.

Farmworker Housing

Previous researchers have noted that farmworkers are one of the few occupational groups for whom housing may be directly tied to employment. Historically, this housing has not met local zoning standards. In their work summarizing the literature on farmworker housing, Quandt and colleagues described farm labor dwellings as having exposure to agricultural chemicals (e.g. in rugs and other furnishings) and pest infestations. Additionally, they noted widespread structural deficiencies such as leaky roofs, holes in walls and floors, unsafe drinking water, and dysfunctional electrical, plumbing, air conditioning or heating systems.

Separate from the physical condition of farmworkers’ dwellings, previous literature has investigated their compositional quality, that is the extent to which the dwellings were crowded or overcrowded. Generally, dwellings are considered crowded when there is more than one person per room, and considered overcrowded or severely crowded when there are more than 1.5 persons per room. A study examining housing characteristics among farmworker families in North Carolina utilized interviews of mothers with at least one child aged two to four years in farmworker families over two years. The researchers found that about 40% of the interviewed mothers reported that six or more individuals resided in their home. Twenty percent of the 221 participants in the study reported that three or more persons occupied one bedroom, with approximately 6% of the represented households having four or more individuals per bedroom. The study suggested that the large number of residents in these homes may include adults who are not members of the nuclear family that the interviewed mothers belonged to. The authors noted that housing scenarios like this have been shown to be associated with undesirable health effects such as stress among adults and developmental delays among children.

VARIATION BY RACE AND ETHNICITY

Studies have shown that minority populations in rural areas encounter disparate housing experiences. Minority populations often face
pervasive health disparities compared to their White counterparts,\textsuperscript{49} and this is no different in the context of housing. In a recent study that utilized a nationally representative sample, it was shown that 48\% of rural Native Americans reported experiencing major housing problems relative to 26\% of rural Whites.\textsuperscript{50} Moreover, in this same study, it was shown that 20\% or rural Native Americans experienced major problems paying for housing versus 9\% of rural Whites.\textsuperscript{50}

A qualitative study exploring the experiences of foreign-born Latinos specifically focused on Mexicans and Central Americans who settle along the borderlands between the United States and Mexico.\textsuperscript{51} The study, which was published in 2018, noted that many Central Americans and Mexicans in these areas reside in communities that lack basic resources and are characterized by abject poverty.\textsuperscript{51} Impermanent housing was also found to be very common, with seasonal and non-contractual employment being major contributors.\textsuperscript{51} The study’s authors noted that situational life events coupled with persistent and daily chronic strain tied to low social status, lack of employment and housing instability furthered stress and subsequent poor mental health outcomes such as depression.\textsuperscript{51}

In another study, researchers explored the associations of poor housing with mental health among Latino migrant farmworkers in North Carolina.\textsuperscript{52} The authors conducted both housing inspections and interviews with 371 farmworkers residing in 186 camps. When conducting housing inspections and interviews, the researchers explored the number of people per sleeping room, having a key to a dwelling’s door, perceived security of self and belongings, number of housing regulation violations, having access to bedroom storage, and toilet privacy.\textsuperscript{52} In terms of mental health outcomes, the researchers investigated the prevalence of alcohol misuse, anxiety, and depression among the study sample.\textsuperscript{52} Of the 371 Latino migrant farmworkers included in the study, 185 (50\%) had the potential for alcohol misuse, 60 (16\%) had substantial depressive symptoms, and 31 (8\%) had substantial anxiety. Importantly, in terms of housing circumstances, those without a key to their dwelling, those who did not feel safe or that their belongings were protected, and those who lacked bedroom storage exhibited substantial depression and anxiety scores.\textsuperscript{52} The authors noted the distinct links between inferior housing and Latino farmworkers’ mental health and suggested that the study’s findings could be used to inform strategies for preventing and treating poor mental health among migrant farmworkers and for strategies on farmworker housing regulations.\textsuperscript{52}

PROVEN SOLUTIONS OR INTERVENTIONS

Medicaid Demonstration Waivers

Scholars have noted that housing is a critical component in empowering people living with mental illnesses to successfully live in their communities.\textsuperscript{29,53} Yet, securing housing for those being treated for serious mental health illnesses often remains an evasive task. Unlike other essential community-based services such as skilled nursing and hospice care that can be covered by Medicaid programs, housing cannot currently be covered.\textsuperscript{53} This then forces agencies and advocates serving those with mental illnesses to rely on various federal state, and local housing subsidy options where available. One suggestion that has been made to address this problem has been for Medicaid demonstration waivers to be created that would cover housing.\textsuperscript{53} The hypothesis behind this suggestion is that housing could be made more widely available if mental health service systems could use Medicaid funds for housing.\textsuperscript{53} Contingent on a showing that Medicaid financing for housing improves mental health outcomes and reduced reliance on more costly services and perhaps less effective outcomes, the results could inform strategies for modifying Medicaid to allow reimbursement for housing where appropriate.\textsuperscript{53}

Home Repairs

Previous research has noted that resources targeted toward home repairs can have a profound impact on health.\textsuperscript{54} A study conducted in rural East Tennessee qualitatively explored the impact of home repairs on physical, mental, and social health.\textsuperscript{54} Twenty-eight interviews were conducted and themes from them were extracted for inference. The interviewees resided in four counties that are classified as ‘at-risk’ or ‘distressed’ and are a part of the Appalachian region, where poverty rates increase as rurality
increases. The Appalachia Service Project (ASP), a nonprofit organization, has been on a mission to repair homes for low-income families in rural Central Appalachia since 1969. Each year, ASP provides critical repairs for more than 350 families with the help of upwards of 15,000 volunteers. It has been posited that the efforts of private or nonprofit organizations, such as ASP, may be more effective in improving housing among rural residents due to resistance to governmental authority and assistance programming, as well as a desire to preserve autonomy and self-sufficiency.

Researchers explored the extent to which the ASP’s repairs impacted environmental risk reduction, physical health, mental health, financial well-being, and willingness to receive assistance from service organizations. Interviewees reported reduced mold, pests, leaks, moisture, and fall risk, as well as improved climate control. Interviewees also noted that the repairs made coping with health problems such as arthritis, cancer, and chronic obstructive pulmonary disease (COPD) more bearable. The following quotes are representative of the feedback the researchers received with respect to physical health: “We’re not getting sick as often because it’s not cold in the house,” and “We have been less prone to get sick, just because of the lack of the leaky roof, the new sheet rock on the walls,... the insulation in the ceiling.” Importantly, the researchers noted that the most frequently reported impacts centered on mental health. Two of the quotes from those interviewed were, “[The house] was stressing us out and we don’t worry about that now...it lifted a great burden,” and “Family and friends come in and visit and we’re not embarrassed or anything about how our house looks...so [we] socialize more.” Financial impacts such as reduced utility costs and increased property value were also described during the interviews. Taken together, the impacts of this program’s efforts on physical, environmental, and mental health, as well as financial well-being, provide some insights into the outcomes that can be achieved through service organizations’ focus on housing repairs.

**Self-Direction in Treatment for Serious Mental Health Conditions**

Mental health researchers and clinicians have placed increasing emphasis on self-direction or self-directed care as a form of person-centered treatment in recent years. Self-direction in mental health treatment typically involves patients purchasing goods and services and controlling an individualized budget in ways that support their personal recovery and overall mental health goals. Self-directing patients typically have a coach or broker that assists with the development of person-centered plans, the tracking or progress toward goals and objectives, and assistance with financial management.

In a quasi-experimental study published by Croft and colleagues in 2018, the outcomes of self-directing and non-self-directing individuals were explored, particularly in the contexts of employment and housing independence. This study lasted approximately four years, and specifically explored employment status, income from paid employment in the past 30 days, and days worked for pay in the last 30 days. Moreover, the authors explored the transition from dependent housing (i.e. group home settings, assisted living, living with others, etc.) or homelessness to living independently, or maintaining independent housing status. The study’s findings were promising. They showed that self-directing individuals were more likely to have had positive ‘days worked for pay’ outcomes than the non-self-directing participants in the study. Moreover, self-directing individuals were more than twice as likely to attain or maintain independent housing compared to those in the non-self-directing group. The authors suggested that future work should involve mixed methods and implementation science approaches to explore the complex issues associated with the reach of these kinds of programs and the key characteristics of support personnel that are key for achieving gains in independence.

**Permanent Supportive Housing and Housing First Programs**

It is now understood that housing stability and community reintegration are critical components of mental health and addiction treatment. This is especially true for individuals who experience chronic homelessness. In a column describing a mixed methods study conducted by the Southeast Mental Health Technology Transfer Center to
identify regional mental health priorities in eight states of the southeastern United States, supported housing was highlighted as a critical priority area. The authors of the column further explained that based on their mixed methods study, areas of need to achieve robust supported housing programs included financing, expanded housing programs and improved integration and coordination between mental health services and supported housing.

Permanent Supportive Housing (PSH) is one such program that has been designed to expand and integrate mental health services and housing efforts. Permanent Supportive Housing has been defined by the U.S. Department of Housing and Urban Development (HUD) as “community based housing without a designated length of stay in which formerly homeless individuals and families live as independently as possible.” Critical to PSH are supportive services to assist homeless individuals with disabilities or families living with an adult or child with disabilities.

Smelson and colleagues conducted a pilot study to examine the feasibility of integrating permanent supportive housing and an evidence-based intervention called Maintaining Independence and Sobriety Through Systems Integration, Outreach, and Networking (MISSION). The researchers recruited 107 individuals with co-occurring mental, substance use, and other disorders who were living in chronic homelessness from inner-city and rural areas of Massachusetts. The evidence-based intervention (MISSION) included case managers and peer support specialists who served approximately 15 clients at a time. The program employed a gradual reduction strategy in which clients received 2.5 hours of individual or group sessions per week for 10 months, and two 2.5 hour sessions per month for the remaining two months of the 12-month program. This reduction was intentional and was aimed toward assisting clients with the transition from MISSION to community-based services. While the study did not stratify results by rural and urban residence, the findings showed that 79% of the participants who were placed in permanent supportive housing during the study remained housed at the end of the study. This was particularly notable, as each of the participants had co-occurring mental and substance use disorders and had been chronically homeless upon entering the program. The researchers attributed the success of the program to case managers who were both trained in MISSION and in permanent supportive housing, which meant that clients were receiving services and support from the same care teams as opposed to fragmented services from various providers.

Another study published in 2022 examined PSH among a sample of adults with disabilities. This study was based in North Carolina and included individuals who began participating in a PSH program between 2015 and 2018. Specifically, the researchers involved in the study set out to explore retention in the PSH program and sought to identify factors associated with housing retention and duration. The findings showed that older age, female gender, and non-Hispanic Black race/ethnicity were associated with lower risk of PSH departure. Furthermore, having a severe mental illness was associated with greater risk of departure from the PSH program. Importantly, rurality of the PSH placement and level of socioeconomic deprivation were not associated with greater PSH program departure risk, indicating that this approach is promising in rural settings.

Housing First is similar to PSH in that it provides subsidized permanent housing to people with disabilities experiencing homelessness. However, in Housing First programs, there is no requirement that clients undertake treatment for their disability or in the case of those living with substance use disorder (SUD), attain, and maintain sobriety. In a study published in 2020, researchers conducted a systematic review to assess the effectiveness of Housing First programs. In this systematic review, Housing First programs were compared to Treatment First programs, which require clients to be ‘housing ready’ and substance free before receiving support toward permanent housing. The study’s results showed that Housing First programs reduced homelessness more than Treatment First programs. Moreover, the study found that Housing First programs strengthened housing stability among participants in that the number of days and the proportion of time the participants were stably housed increased. Additionally, for clients living with a human immunodeficiency
virus (HIV) infection, Housing First clients had 63% greater housing stability across included studies relative to Treatment First clients and 38% less homelessness.\textsuperscript{63} Housing First clients living with an HIV infection also saw improved physical health, as well as lower perceived stress and depression.\textsuperscript{63} Importantly, the systematic review’s authors noted the lack of specific inclusion of rural clients among the included studies.\textsuperscript{63} In another more recent systematic review, it was shown that while evidence from studies published in the United States revealed that the economic benefits of Housing First Programs outweigh the cost of the programs, no included studies examined the economic impact of the program for rural residents.\textsuperscript{64} Thus, while Housing First could potentially be an effective solution for rural residents experiencing homelessness and health disorders, this solution has been understudied for this subpopulation. Rural providers, funders, and stakeholders interested in increasing the proportion of homeless adults with mental health programs who receive mental health services could explore the feasibility and impact of Housing First programs in remote settings.

**Screening for Housing Needs**

With increasing awareness and acknowledgement of the importance of connecting social circumstances to health outcomes, more healthcare providers are screening for social needs and exploring referral interventions in their practices.\textsuperscript{65} In a 2023 study published by investigators in Oregon, patients’ willingness to participate in social needs navigation following remote and in-person screening was assessed.\textsuperscript{65} Rural patients were represented in the study. The investigators found that there was no statistical difference in willingness to accept social needs navigation (e.g. referral interventions) based on whether the patient was seen in person or remotely, indicating that remote screening may not adversely impact willingness to agree to assistance with services tied to stable housing acquisition, among others.

Notably, researchers also recently set out to estimate the costs of intervening in health-related social needs, including housing needs that were identified during primary care visits.\textsuperscript{66} Data on the social needs of patients seen in primary care settings were obtained from the National Center for Health Statistics from 2015 to 2018, with patients seen in rural non-FQHCs in high-poverty areas represented in the study. The investigators found that 78% of patients with housing needs were eligible for assistance, but only 24% of them were enrolled in programs that provide aid.\textsuperscript{66} They additionally estimated that on average, $60 per patient per month was needed to provide evidence-based interventions for housing, transportation, food and care coordination needs.\textsuperscript{66} Importantly, the researchers noted that less than half of this cost ($27 on average) is currently covered by federal funds, indicating that substantial state, local, and private resources are still needed to address social needs such as adequate housing.\textsuperscript{66} With the country’s continued efforts toward quality improvement in healthcare delivery, several entities, including those that provide care to rural residents, have included screening for housing insecurity in their efforts. Despite this, there is evidence that suggests that rural clinicians are often not aware of housing and other SDoH-related resources that could support and best meet the needs of their patients.\textsuperscript{67} This suggests that improved program implementation and communication between rural clinicians and agencies providing support services should be addressed.

**Solutions for Lead Exposure**

**Window Replacements and Lead Paint Mitigation.** In the previously mentioned 2022 study finding – that neighborhood poverty combined with older housing is associated with adverse birth outcomes – it was noted that allocated funds for place-based interventions that address lead paint mitigation in high-poverty neighborhoods with older housing stock may reduce the risk of undesirable birth outcomes.\textsuperscript{36} One such intervention was described by Jacobs and colleagues in a paper published in 2016 wherein window replacement was explored.\textsuperscript{68} This window replacement intervention took place in Illinois and was funded by a state bond-financed pilot program aimed at replacing old lead-contaminated windows with new lead-free energy efficient ones.\textsuperscript{68} While the study included urban residences, it also included rural ones. The findings of the study showed that lead dust from the start of the study to one year post window replacement was reduced by 44%, 88%, and 98%
for interior floors, interior sills, and exterior troughs respectively. These findings were consistent for both urban and rural households. In addition to average lead dust findings, households for which window were replaced by the state bond-financed pilot program reported reduced occurrences of uncomfortable indoor temperatures and improvements in various health outcomes such as mental health, headaches, respiratory illnesses, and ear infections. The authors of the study concluded that a major source of childhood lead exposure could be eliminated by state and local governments’ funding and operating window replacement programs. In addition to reduced lead exposure, the authors suggested that window replacement programs would increase home market values, create local construction and industrial jobs, as well as improve energy bills for residents.

In-Hospital Environmental Consults. Another strategy aimed at detecting lead exposure and subsequent unwanted health outcomes that has been recently studied is that of environmental health consults for children hospitalized with respiratory infections. This study was based in Alaska and included children from 12 tribal health service areas, five of which are considered rural or remote. Crucially, accessing rural and remote regions required travel by airplane, riverboat, or snow machine. During hospitalization, environmental health specialists from Alaska Native Tribal Health Consortium’s (ANTHC) Community Environment and Health (CEH) provided environmental health consults for parents or legal guardians of Alaska Native children. During these consults CEH personnel educated parents and legal guardians on best practices for woodstove burning, optimal ventilation system operation and maintenance, best practices for house cleaning, mold and moisture control, and proper chemical storage, among other things. The CEH staff additionally provided Healthy Homes Toolkits that included lead test kits. Once households with lead and other exposures were identified, local authorities completed low-cost home modifications. At follow-up, respiratory symptoms were reduced among children whose homes received modifications. Based on these findings, the authors suggested that these in-hospital environmental consults, mailed toolkits, and arranged and targeted home modifications are cost-effective strategies for reducing unwanted exposure-based respiratory outcomes in children.

Policies that Support Farmworkers

The USDA’s Economic Research Service (ERS) has estimated that approximately 50% of hired farmworkers in the U.S. lacks legal immigration status, with many being foreign-born individuals from Mexico and Central America. The ERS has also estimated that immigrant farmworkers make up 73% of agriculture workers in the U.S., making them critically important to food production and supply capacity in the nation. Additionally, in 2022, the average farm wage for nonsupervisory farmworkers, such as field crop workers, was $16.62 per hour – about 60% of the average non-farm wage. Previous work has noted that the agricultural sector is exempt from several of the federal laws that were put in place to protect workers. These facts, coupled with lower levels of educational attainment among farmworkers, set the stage for limited self-advocacy within this group. Scholars who have conducted studies on farmworker housing have called for policies that provide mechanisms through which farmworkers could report substandard housing conditions or perceived housing regulation violations to a third party or agency. This mechanism would equip farmworkers with an option separate from reporting to their employers, who may not be incentivized to fully address their concerns. Additionally, calls have been made for agricultural exclusions from existing labor protections, such as those provided in the Occupational Safety Act of 1970, the National Labor Relations Act, and the Fair Labor Standards Act, to be reversed in support of housing and health among farmworkers. Moreover, allocative policies that boost state and federal agencies’ ability to enforce current housing regulations, train health care providers and agency personnel on identifying and addressing housing needs and related health challenges, and educate farmworkers on housing requirements should be adopted and implemented. Furthermore, adequate federal and state resources that support standardized evaluation of the impact of housing-related policies on farmworkers at regular intervals should be set aside to assess and meet future needs.
SUMMARY AND CONCLUSIONS

Rural residents in the U.S. face unique challenges in ensuring residence in housing that is structurally sound and supportive of overall physical, mental, and emotional health. This is because some rural residents are older and less equipped to repair and maintain residential structures, have lower median incomes, and reside in houses that are older relative to urban housing stock. Investments in affordable housing in rural America have not kept pace with the housing needs, and this has had important implications for mental health, blood lead levels, second-hand smoke exposure and financial well-being for rural communities. Notably, these implications have been profound for children, the elderly, the homeless, and historically marginalized subpopulations such as those belonging to a racial or ethnic minority group.

Despite the challenges, there are promising strategies that private and governmental entities at local, state, and federal levels can employ to achieve the overall goal of promoting healthy and safe home environments in rural contexts in the upcoming decade. These strategies include more robust use of wraparound services that make it easier for housing needs to be identified and addressed, and partnerships with service organizations who may be more trusted by rural residents than governmental entities for housing repairs and lead abatement efforts. Additionally, greater awareness among clinicians of social support programs that address housing needs has the potential to significantly improve mental health outcomes for rural residents, particularly those who experience chronic homelessness. There are also opportunities in the upcoming decade for jurisdictions to consider the passage of robust smoke-free policies that protect multiunit rural residents from disadvantageous exposure to second-hand smoke.

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Related Chapters:
Chapter 1. Mental Health and Mental Disorders: A Rural Challenge
Chapter 10. Rural Economic Stability

Suggested Chapter Citation:
AN EXAMINATION OF THE WORKFORCE IN RURAL AMERICA

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SCOPE OF THE PROBLEM

- Workforce shortages in primary care and behavioral health are high-priority public health issues as demonstrated by Healthy People 2030 (HP 2030) objective AHS-R01.

- Persistent shortages of primary care nurse practitioners and family medicine physicians exist across rural and underserved regions of the United States, leading to difficulty for patients to access primary care (HP2030 objective AHS-R01).

- Public health workforce priorities elevated to “research status” include improving the quality of health departments, (HP2030 objective PHI-R01), improving the financing of public health infrastructure (HP2030 objective PHI-R08), and increasing the use of telehealth to improve access to health services (HP2030 AHS-R02).

- Employer-based worksite wellness programs may provide a means of improving the health of the rural American workforce (HP 2030 ECBP-D03).

Rural communities face challenges in recruiting and retaining a sufficient supply of workers. This is especially true for the rural healthcare workforce of the United States (U.S.). This chapter will explore the current literature related to the workforce needs of rural America. Data are examined according to rural versus urban differences, regional differences, racial and ethnic disparities, and barriers to educating, training, and improving the rural workforce. We also report on possible solutions to primary care workforce shortages, such as telehealth, and recommend needed policy modifications. Information presented in this chapter will address Health People 2030’s overarching goals of creating social, physical, and economic environments that promote attaining the full potential for health and well-being for all. Public health infrastructure has emerged as a high-priority area, particularly preventive health services such as vaccines and a workforce prepared to respond to emergencies and disasters.

HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

Every decade, the U.S. Department of Health and Human Services (DHHS) establishes goals and objectives that, if accomplished, will contribute to making Americans healthier. The current initiative, known as Healthy People 2030, has – for the first time – identified “Workforce” as a leading health indicator. Workforce had not been independently discussed in earlier iterations of Healthy People, where it fell as a specific objective under the Health Care Access and Quality goal.

The overall goal for workforce in Healthy People 2030 is to “strengthen the workforce by promoting health and well-being.” The following Healthy People 2030 objectives are relevant to this chapter:

- AHS-R01: Increase the ability of primary care and behavioral health professionals to provide more high-quality care to patients who need it.
- AHS-R02: Increase the use of telehealth to improve access to health services.
- ECBP-D03: Increase the proportion of worksites that offer an employee health promotion program.
- PHI-R04: Monitor and understand the public health workforce.
RURAL HEALTHY PEOPLE 2030
SURVEY OUTCOMES

Selecting from 62 Healthy People 2030 leading health indicators, 1,291 rural stakeholders responded to a web-based survey to determine the most important health priorities for rural Americans. The respondents consisted of rural stakeholders including government officials, healthcare providers, agency heads, academicians, and community leaders. A total of 25.3% of respondents to the Rural Healthy People 2030 survey identified workforce as a top 10 health concern, making it the 15th highest ranked priority for rural Americans. This is the first time the survey identified workforce independently of health care access and quality, or public health infrastructure.

Results of the survey were evaluated by stakeholder census region, gender, age group, race, field of employment, and by whether they resided in a state with or without Medicaid expansion. Overall, rural stakeholders recognized the workforce as the 15th most frequently ranked health priority for rural Americans, whether respondents lived, or did not live, in a Medicaid expansion state. Workforce ranked relatively high in the West (11th), Midwest (13th), and Northeast (16th), but did not rank in the top 20 in the South (21st). Workforce was ranked higher by male respondents (12th) than by females (15th), and by non-White respondents (11th) compared to those who identified as White (15th). Rankings by field of employment varied from 7th, for respondents working in federally qualified health centers, to 22nd for employees of rural health clinics.

OVERVIEW OF THE RURAL AND RURAL HEALTHCARE WORKFORCE

The U.S. Department of Agriculture (USDA) in its 2022 Edition of Rural America at a Glance addressed the changing rural demography of the country. While the percentage of the population aged 65 and older living in nonmetropolitan areas has increased to 20% from 2010 to 2021, during the same period, the nonmetropolitan working-age population declined by 4.9%. Along with economic diversity, this period also saw increased employment in five major industries: government, manufacturing, retail, health care, and social assistance. Rural employment in health care and social assistance experienced significant growth of 21.5% between 2001 and 2019. While in 2012 more than half of rural American workers held middle-skill jobs, driven by the service sector like healthcare, over the last decade there has been an increasing number of rural college-educated workers, creating a shift in rural industries that employ high-skilled workers.

Health professional shortages in rural areas of the country persist. Figure 1 provides an up-to-date overview of rural counties in the U.S. that are health professional shortage areas (HPSAs) for primary care. A HPSA is defined as a geographic area, population, or facility that has a shortage of primary, dental, or mental health care providers. The Bureau of Health Workforce, Health Resources and Services Administration (HRSA) reports that 61.52% of primary medical HPSAs are rural, 31.87% are nonrural and 6.61% are partially rural. There is a greater need for primary care health professionals in rural counties as compared to urban areas (See Figure 1). In the 2023 HRSA Health Professional Shortage Areas report, HRSA predicts a shortage of 17,303 primary care practitioners, 12,582 dental practitioners, and 8,253 mental health practitioners.

The American Association of Medical Colleges (AAMC) estimates a 12% increase in physician demand between 2019 and 2032 in rural areas of the U.S., equating to the need for approximately 95,900 additional full-time physicians in rural areas. Estimated needs for advanced practice professionals (APPs), both nurse practitioners (NPs) and physician assistants (PAs), call for an additional 22,700 NPs and 12,800 PAs. Eliminating full practice authority restrictions for NPs, which has been accomplished in 27 states, led to improved healthcare access for rural and underserved populations without affecting quality of care.

According to HRSA, 24% of licensed practical or vocational nurses and 16% of the registered nurse workforce practice in rural areas. Approximately half of the rural healthcare workforce is comprised of registered nurses. HRSA's Health
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Workforce Simulation Model projected a national licensed practical or vocational nurse deficit of 13% by 2030.\textsuperscript{15}

National estimates and projections of the registered nurse workforce supply and demand mask geographic workforce disparities (as noted in Table 1). In addition, the estimates fail to consider the ability to recruit and retain nurses in rural areas. In light of these difficulties, some rural healthcare settings have entered into collaborative agreements with colleges and universities to create a pipeline to rural hospitals to increase recruitment and retention.\textsuperscript{16}

Despite the American Dental Association’s determination that the supply of dentists is adequate to meet population needs across the U.S., the major problem is that not enough dentists are working in rural areas.\textsuperscript{17} Less than 2% of male dentists, and less than 1% of female dentists, practice in rural areas. While Surdu et al. (2021) reported that men are more likely than women to practice as rural dentists, there is still a paucity of rural dental care.\textsuperscript{17} As such, teledentistry is becoming more prevalent in rural areas, but state policies and regulations have not kept pace with emerging technologies. The typical model is a dental hygienist and an assistant on-site, while a dentist is available remotely.\textsuperscript{18}

There are major disparities between rural and urban areas of the U.S. in the supply of behavioral health professionals, including psychiatrists, psychologists, psychiatric/mental health NPs, social workers, and counselors.\textsuperscript{19,20} Behavioral health needs are increasingly addressed through the co-location of behavioral health workers with primary care providers. There are rural and urban differences in access to co-located professionals that reflect a significant disparity as seen in data from the National Provider Identifier.\textsuperscript{21} Rural
primary care providers were significantly less likely to have a co-located behavioral health worker than their urban counterparts (26% vs. 46%, respectively). The fewer primary and specialty care providers associated with a practice setting, the less likely there will be a co-located behavioral health professional.\textsuperscript{21,22} Projections for the nation suggest that the number of behavioral health professionals will not be enough to meet needs by 2030.\textsuperscript{20}

Differences in the number of health professionals per 10,000 people exist in rural versus urban areas.\textsuperscript{22} Data from the Area Health Resources Files are publicly available from HRSA. Table 1 demonstrates the differences in supply for select professions.

**VARIATIONS BY RACE/ETHNICITY**

In rural America, economic diversity has not been reflective of workforce diversity. In 2012, middle-skill employment (some training, but less than college degree) in rural areas was reportedly held by 51% of all workers compared to 42% in urban areas.\textsuperscript{9} Hispanics in rural areas were more likely to hold middle-skill jobs than Blacks or Whites.\textsuperscript{9} Older workers in rural areas were more likely to hold middle-skill jobs compared to younger workers.\textsuperscript{9} Between 2012 and 2019, rural job growth was highest for Hispanics, and for all races other than White, in almost every industry except agriculture.\textsuperscript{8} Although there has been improvement in the past decade, much remains to be done to achieve gender and racial parity in rural communities and to address the changing demographic and economic needs.

In rural health professions, several racial, ethnic, and disability groups remain underrepresented.\textsuperscript{23} To better address health inequities and disparities, one recommendation is for organizations to commit to hiring individuals that reflect the diversity of their communities. However, the lack of interest in rural placements makes recruiting and retaining healthcare professionals from diverse backgrounds difficult. The Rural Healthcare Workforce review by the Rural Health Information Hub (2023) acknowledges that 83.2% of rural Licensed Practical Nurses (LPNs) are White individuals, compared to 56.9% in urban

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Health professionals per 10K, Rural</th>
<th>Health professionals per 10K, Urban</th>
</tr>
</thead>
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<tr>
<td>Dentists</td>
<td>3.1</td>
<td>4.8</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>64.5</td>
<td>93.9</td>
</tr>
<tr>
<td>Licensed Practical Nurses/Licensed Vocational Nurses</td>
<td>24.2</td>
<td>20.0</td>
</tr>
<tr>
<td>Physician Assistants</td>
<td>9.4</td>
<td>11.9</td>
</tr>
<tr>
<td>Physicians (MDs)</td>
<td>11.0</td>
<td>31.5</td>
</tr>
<tr>
<td>Physicians (DOs)</td>
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</tr>
<tr>
<td>Primary Care Physicians</td>
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<tr>
<td>Nurse Practitioners</td>
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<td>Total Advanced Practice Registered Nurses</td>
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<td>11.9</td>
</tr>
<tr>
<td>Nurse Anesthetists</td>
<td>1.2</td>
<td>1.7</td>
</tr>
</tbody>
</table>

*Source:*\textsuperscript{22}
Minority physicians are more likely to practice in underserved areas than their White counterparts. However, the percentage of White family physicians practicing in rural areas is still higher than those practicing in urban areas (90.5% vs. 82.7%). The American Hospital Association recommends the creation of programs that develop a strong sense of community between health professionals and the rural community they serve, in order to increase recruitment and retention of a diverse workforce.

RURAL WORKSITE WELLNESS

Rural workplace brings unique healthcare challenges associated with unhealthy lifestyles. Worksite wellness and employee health are affected by cultural factors and the demography of the workforce. A study in rural Kentucky identified the barriers to integration of health protection and health promotion, concluding that time, job demands, attitude, and knowledge level hamper integration. However, there was greater awareness of Total Worker Health, increased understanding of the need for wellness, and plans in place to undergo the integration. Work by Hibbs-Shipp et al. (2015) in Colorado investigated the motivators and barriers to healthy workplace behavior and found significant interest and need among staff members for wellness programs. Motivators included stress relief, health, and weight concerns, while barriers included time, fatigue, and money. Although states like Massachusetts are working on wellness programs and developing protocols for worksites, there is a need for developing similar programs across rural America. Continued uptake, integration, and implementation of wellness programs in rural areas would contribute to a healthier workforce and higher productivity.

Rural work sites are appropriate settings for understanding workforce health and promoting preventive healthcare. Assessing worker participation in wellness programs is pivotal to the success of such programs. Findings by Middlestadt et al. (2011) described greater willingness to participate in wellness programs among younger, health-conscious, and physically active employees, who are already more likely to be healthy and require less clinical intervention. Lower uptake of health risk assessments among employees is associated with less utilization. This highlights the need for greater penetration of wellness initiatives among rural employees.

In the rural workforce, improvements in worksite assessment uptake hinge on the development of goals, creating workplace wellness committees, assessing employee needs, providing financial incentives, and creating structured programs, along with healthy competition, cohesion, and camaraderie among the workers. While health assessment tools like the Centers for Disease Control and Prevention (CDC) Worksite Health Scorecard enable employers to assess their implementation of health promotion strategies, major challenges such as lack of policies, system-level improvements, and stakeholder engagement and support remain a hindrance for the rural workforce.

BARRIERS/CHALLENGES

The rural workforce faces multiple economic, financial, and demographic barriers. The rural American workforce is older, less diverse, and poorer compared to their urban counterparts. Almost a quarter of rural businesses struggle to find qualified workers. Rural areas also have limited or no access to quality childcare and broadband. Workforce development faces interrelated challenges. Globalization, technological advancements, economic shifts with job reclassification and training, along with political changes and demographic shifts have resulted in a growing gap between rural and urban areas. There is a need for employers and workforce development stakeholders to develop strategies that take into consideration the specific needs of individual groups.

There are many barriers to the wide adoption of telehealth in rural America, most notably the digital divide highlighted during COVID-19, with large areas of rural and underserved communities lacking affordable and reliable broadband access. Infrastructure services like broadband can help increase educational and training opportunities for the rural workforce. The inequities discovered over the past three years have pushed broadband or internet access to be recognized as a social determinant of health. Access to technology affects a myriad of other factors impacting
economic stability, access to education, and social cohesion. As recently as 2023, the Federal Communications Commission (FCC) reported 8.3 million homes and businesses still lack access to high-speed broadband.\textsuperscript{37} As an essential service, affordable internet access could potentially improve rural workforce diversity.

In addition to broadband access and affordability, other barriers to telehealth access to rural populations include patient privacy, provider licensure, and attitudes toward technology among patients and providers. Patient privacy requirements and compliance are complicated, yet important to maintain. Similarly, licensure requirements vary by state, and it is even more complicated to be licensed in multiple states. Other challenges include online prescribing and the threat of malpractice. In addition, high annual turnover rates of mental health services providers are threatening the advances made in telehealth.\textsuperscript{38} A 2023 study by Thomas, et al, identified several factors important to greater adoption and acceptance of telehealth and virtual healthcare delivery. These include consideration of existing practices and processes, equitable access, and workforce perceptions.\textsuperscript{39}

Rural and frontier living may mean difficulty in accessing the tools and resources needed for successful telehealth practice. But as it increasingly plays a vital role in accessing health and health-related services, we must eliminate the digital divide. Reliable connectivity can decrease distrust and frustration in patients who already are unsure of telehealth validity and reliability. Physicians confirm this digital divide exists, seeing their patients struggle with virtual care (i.e., gaps in understanding and accessing technology). As rural and frontier community demographics shift to older residents, telehealth may be daunting or confusing given lower levels of digital literacy among older populations.

Recent efforts to improve access to healthcare through telehealth services at the national level include\textsuperscript{8,40}:

1. Increased access to broadband and availability of high-speed internet;
   a. The FCC’s Rural Healthcare program for broadband adoption increased the annual cap by $171 million\textsuperscript{8,40}
   b. HRSA’s Office for the Advancement of Telehealth’s Telehealth Broadband Pilot Program, assesses broadband capacity available to rural healthcare providers and patient communities to improve their access to telehealth services\textsuperscript{39,40}
   c. Universal Service Fund\textsuperscript{39,40}
   d. Rural Healthcare Program\textsuperscript{39,40}
   e. Connected Care Pilot Program\textsuperscript{39,40}
   f. Federal Affordable Connectivity Program\textsuperscript{39,40}

2. Increased flexibility for providing services via telehealth and provider eligibility for Medicare reimbursement by DHHS;

3. Building evidence that supports care delivery through telehealth across the CDC, including both short- and long-term impacts such as access to care, healthcare quality, healthcare utilization, health outcomes, and health equity.

**SOLUTIONS AND INTERVENTIONS**

**Workforce Development**

Developing a stronger rural workforce requires a comprehensive, multifaceted approach. The USDA Resources Guidebook recommends extensive workforce development planning which requires the local workforce development board to leverage regional resources to increase community participation. The USDA also recommends the development of a rural workforce resource guide matrix to better provide information for rural workforce stakeholders.\textsuperscript{41} Alignment of employer needs with the development of cross-sector strategies and governance can positively influence rural areas’ growth. Infrastructure development initiatives like high-speed internet, transportation services, and waste management are critical for rural industry growth. Building partnerships with minority and disadvantaged groups, and consulting industry partners in designing educational and apprenticeship programs can help address the workforce shortage issue.\textsuperscript{41,42} There is a need to identify gaps and make strategic investments in the development of these underserved regions.
Investment in rural entrepreneurship to spark innovation must take priority.

Establishing workforce development programs in high schools helps develop skilled individuals who can go on to receive the necessary skills for employer areas of need. Collaboration between companies, communities, governments, and stakeholders is required for workforce development. Developing rural sector networks where employers identify needs, and a collaborative approach with training providers, can help develop a pipeline of skilled workers and mitigate the workforce challenges in underserved areas. Workforce Intermediaries help build partnerships and networks in regional development strategies and ensure workers are prepared for sectors with high growth.

**Worksite Wellness Programs**

Worksite wellness programs are essential for the rural workforce to access critical services. One such example is the Montana Worksite Wellness program. The program ensures employees at participating worksites have access to personal and health resources such as physical activity and nutrition programs, tobacco cessation help, cancer as well as chronic disease prevention and management, access to health coaches, and school wellness programs. In addition, hospitals participating in the Montana worksite wellness program may be eligible for additional funding support for worksite wellness initiatives. This is a replicable and sustainable model for worksite wellness for the rural workforce.

**Workforce Issues**

Sustainable solutions to rural workforce issues are urgently needed. For example, to increase the supply of healthcare workers during the COVID-19 pandemic, many states, including New Jersey, instituted temporary licensure reciprocity policies, allowing healthcare workers from other states to provide care in their state. Most of their patient encounters were via telehealth. Patients and off-site providers reported positive experiences with this telehealth-driven solution to meeting patient needs.

The use of technology by social workers helps reduce health disparities and improve rural health outcomes. There is a need for digital literacy and training for social workers, especially minorities. Historically Black Colleges and Universities are uniquely positioned to provide training to a diverse community due to their long-standing connections with marginalized communities and populations.

**Partnerships and Collaborations**

In rural communities, it is especially important to reflect on resource inequities, but at the same time recognize that many issues rural communities face are often like those of urban communities. Population health issues in any community can be complex, but are often made more challenging in a rural setting due to a potential lack of resources. With rural hospital closures, and a continued shortfall of available staff to address population health, collaboration with a variety of community sectors can provide opportunities to collectively address complex health issues, as opposed to a single agency having sole responsibility. The importance of keeping rural hospitals open cannot be underestimated. Rural hospitals can take the lead in capacity-building activities for health improvement as a key partner in resource development, training, technical assistance, and information dissemination when attempting to address community population health issues. Building on existing relationships, or establishing new ones, is at the core of such collaborative efforts. Relationship-building is a key component in increasing a community’s collective capacity to improve population health, including social determinants of health.

Partnership or collaboration can unite community resources for a common, shared purpose, such as better coordination of services, improved relationships, reduction in duplication of services/efforts, and merging and/or leveraging skills and resources of the collaborative group. Healy discusses working from an asset-based approach for community development where change comes from within the community. These existing capacities and assets within the community are enhanced and used in collaboration with changes driven by relationships. Ultimately, this community change is oriented toward sustainable community growth.
Building upon and developing new relationships among network members can generate trust and confidence in collaborating entities and individuals. The Brazos Valley Health Partnership in Central Texas engaged in a community health development process in the early 2000s to increase access to health and health-related care for low-income residents of a rural seven-county region that faced the typical rural health issues related to healthcare access. Enhancing existing and establishing new relationships among local providers with limited resources and staff, led to a unified, shared purpose through the implementation of county health resource centers. As a locally driven effort to address population health issues in small rural counties with limited resources, positive changes in inter-organizational relationships were noted in the project’s evaluation. By addressing the limited access to health and health-related care through a unified, yet diverse group of local stakeholders (such as the regional hospital system, non-profit organizations, governmental health organizations, county and city government officials, and educational entities) nearly 20 years later, each of the seven counties still has locally sustained health resource centers to address their local community’s needs.

Another strategy to build and develop new relationships that generate trust and confidence is the utilization of community health workers. According to the American Public Health Association (2023), community health workers play a key role as they are frontline lay workers, generally trusted members of the community, and have a unique understanding of the community served. This trusting relationship enables the community health worker to serve as a liaison between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery. In rural environments, community/lay health workers are essential to healthcare delivery. Community health workers provide culturally appropriate information and health services including care coordination, advocacy, social services, and prevention and management of chronic diseases.

**Telehealth Technology**

Technology advancements increase the opportunity for rural communities to have easier access to external resources, such as telehealth, which is used more often to increase the availability of services to rural areas that lack an adequate number of, or access to, specially trained health professionals. Two excellent examples of the use of telehealth in Texas are the Texas Child Health Access Through Telemedicine (TCHAT) and the Texas Teleforensic Remote Assistance Center (Tex-TRAC). Through legislative funding, TCHAT leverages the expertise of the state’s institutions of higher education to provide in-school behavioral telehealth care to at-risk children and adolescents. With approximately 80% of 254 counties in Texas designated mental health professional shortage areas, TCHAT bridges communities with limited or no access to mental health services to external resources.

To support rural hospital clinicians, Tex-TRAC connects rural community hospitals to expert Sexual Assault Nurse Examiners (SANE) to provide support and guidance during a medical forensic exam following sexual assault. Because sexual assault can occur anywhere, yet access to a SANE is primarily concentrated in urban centers, the Tex-TRAC project helps bridge the gap by supporting nurses and survivors in medically underserved and rural areas with experts in trauma-informed care utilizing telehealth technology.

Other states have taken similar technological initiatives to address rural healthcare needs. The Pediatric Access to Telemental Health Services (PATHS) program in Alabama provides behavioral health consultation and treatment to rural children and adolescents. Connecting these rural communities to primary care and behavioral health professionals brings much-needed care through the implementation of telehealth technology. Similarly, upper Midwestern and frontier states of North Dakota, South Dakota, Nebraska, Wyoming, and Minnesota benefited from telehealth initiatives like eEmergency and eCare that connected rural patients with trained physicians and registered nurses funded through organizations like the Helmsley Trust and Avera Health. Helping more than 7,200 patients and enabling 11,000 patient transfers, the initiative provided remote telehealth access to more than 495,000 square miles of rural U.S.
Telehealth technology (also known as telemedicine and digital health) presents an opportunity to increase access to critical healthcare services in rural and frontier communities. With approximately 46 million people living in rural and frontier areas and 80% of the rural U.S. designated as medically underserved areas, telehealth technology can be a strategic tool used to improve health equity.\textsuperscript{22}

Telehealth can improve the quality of care for patients, especially those in rural and underserved communities, by increasing access to physicians, specialists, and other healthcare and critical support services for patients in rural, frontier, and underserved areas. Potentially an even more critical benefit, patients may be able to stay close to home when seeking care via telehealth, decreasing travel time and costs, as well as decreasing the time taken off work or out of school. The technology also presents remote providers with access to additional resources, increasing access to experts or specialists for consultation or supplemental services.\textsuperscript{73}

Telehealth has been shown to reduce primary care provider isolation by fostering collaboration and learning between those practicing in rural areas and those in larger medical centers.\textsuperscript{74}

The Rural Health Information hub cites several examples of evidence-based approaches to address health profession shortages as quoted below\textsuperscript{22}:

- Using interprofessional teams to provide coordinated and efficient care for patients and to extend the reach of each provider,
- Increasing the supply and placement of licensed vocational/practical nurses and registered nurses in rural areas,
- Ensuring that all professionals are practicing to the full extent of their training and scope of practice,
- Removing state and federal barriers to professional practice, where appropriate,
- Changing policy to allow expansions to existing scopes of practice if evidence shows that the healthcare workers can provide comparable or better care,
- Removing barriers to the use of telehealth to provide access to remote healthcare providers,
- Introducing pipeline programs and funding mechanisms, and
- Increasing incentives and compensation for rural health professionals.\textsuperscript{22}

**SUMMARY AND CONCLUSIONS**

It is important to leverage the healthcare workforce in new and innovative ways, with more care taking place outside of traditional settings. Flexibility in the way individuals connect with and engage in care is critical.

Relationships are central to the development, forward progress, and collective action of community-based partnerships and collaborations. Often, evaluation of partnerships or community collaborative efforts focuses on achieving outcomes and effectiveness; however, community capacity building has many dimensions including:\textsuperscript{58} skills and resources, nature of social relations, structures and mechanisms for community dialogue, civic participation, value systems, and learning culture.

Continued expansion of telehealth as a means of healthcare provision means identifying evidence-based practices and policy changes to address challenges. There is a need to improve the quality and standardization of data to fully demonstrate and understand the impact of telehealth and identify where disparities persist. Telehealth plays a key role in helping to address workforce issues by enhancing access and reducing burnout.

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An Examination Of The Workforce In Rural America


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Related Chapters:
Chapter 3. Rural Healthcare Access and Quality
Chapter 8. Preventive Care for Rural Populations and Providers: Routine Screenings, Prenatal Care, and Oral Health
Chapter 13. Public Health Infrastructure in Rural America: Elevating Quality Improvement, Accreditation and Core Competencies
Chapter 17. Health Insurance for Rural Americans

Suggested Chapter Citation:
RURAL EDUCATION ACCESS AND QUALITY

By Andrew L. Kipp, EdD

SCOPE OF THE PROBLEM

- Adults with higher educational attainment (e.g., high school graduation, college attendance) have better health and life spans compared to their less-educated peers.\(^1\)
- The estimated average graduation rate for rural students is 88.7%, which is four percentage points higher than the United States national average for all locales.\(^2\)
- Rural students perform better than nonrural (i.e., suburban or urban) students on reading and math state standardized tests initially, in kindergarten, but fall behind nonrural students by the 8th grade.\(^3\)
- Despite the gap narrowing, rural students continue to have lower college enrollment rates in the first fall after high school graduation when compared to their suburban or urban peers.\(^4-6\)
- Rural students of color lag behind rural White students in educational attainment and student achievement (i.e., student performance across all subjects).\(^4,7-9\)

The Education Access and Quality topic includes goals that are new to Rural Healthy People and expands upon the Social Determinants of Health topic from previous iterations. Education is a vital component to healthy living. Adults with higher educational attainment have better health and life spans compared to their less-educated peers.\(^1\) Additionally, the role of post-secondary education positively influences infant mortality, life expectancy, and child vaccination rates.\(^1\) People with higher educational attainment, for example, had a reduced risk of COVID-19 severity and hospitalization due to lower levels of vaccination hesitancy and better engagement in health-protective behaviors.\(^10\) Moreover, people with higher educational attainment have a stronger belief that they control their health and better understand health professionals' recommendations.\(^11\) Finally, healthy children learn better.\(^12\) These facts illustrate the interdependence between education and health where meeting the needs of schools can help improve public health.\(^12\)

The goals of this Rural Healthy People 2030 chapter are:

1. identify educational disparities between rural and nonrural school environments, variations by race and ethnicity, and region;
2. recognize contemporary educational barriers within rural schools in the U.S.;
3. illustrate school structures, interventions, and community efforts to mitigate the problems/barriers, improve educational outcomes, and elevate rural health.

The Education Access and Quality topic within Healthy People 2030 illustrates the national trends in meeting goals to improve education.\(^13\) Three objectives improved from their previous (i.e., Healthy People 2020) baselines:

- increase the proportion of high school students who graduate in 4 years;
- increase the proportion of students with disabilities who are usually in regular education programs;
- increase the proportion of 4th-graders with math skills at or above the proficient level.\(^13\)

Two objectives regressed from their previous baselines:

- increase the proportion of high school graduates in college the October after graduating;
- increase the proportion of 4th-graders with reading skills at or above the proficient level.\(^13\)
The remaining objectives in the topic are either developmental objectives or objectives currently being researched. Of these objectives, one objective—increase the proportion of 4th-graders with reading skills at or above the proficient level—was recently classified as a leading health indicator (i.e., a high-priority area to drive action). The objectives, however, do not differentiate between rural and nonrural settings.

Within the U.S., about one in every five students (more than 9.3 million) attend a rural school, which increases the urgency to address deficits in this context. Nearly half of all rural students live in Texas, North Carolina, Georgia, Ohio, Tennessee, New York, Pennsylvania, Virginia, Alabama, and Indiana. The needs within each educational context (i.e., urban, suburban, and rural contexts) vary greatly, and we need to differentiate between the distinct educational contexts to understand the pressing concerns in rural schools and address their unique needs.

HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

The Healthy People 2030 goal for the Education Access and Quality topic area is to “increase educational opportunities and help children and adolescents do well in school.” To meet this goal, our chapter aims to provide an overview of a select number of Healthy People 2030 objectives within a rural setting, compare the data and trends to their urban, suburban, national, or nonrural counterparts, identify rural barriers that resist progress, and discuss research-based approaches to overcome these barriers. The chapter addresses the following objectives:

- **AH-08** Increase the proportion of high school students who graduate in 4 years
- **SDOH-06** Increase the proportion of high school graduates in college the October after graduating
- **AH-06** Increase the proportion of 4th-graders with math skills at or above the proficient level
- **AH-05** Increase the proportion of 4th-graders with reading skills at or above the proficient level
- **AH-R05** Increase the proportion of 8th-graders with math skills at or above the proficient level
- **AH-R04** Increase the proportion of 8th-graders with reading skills at or above the proficient level

RURAL HEALTHY PEOPLE 2030 SURVEY

In a nationwide survey of rural stakeholders, Education Access and Quality was ranked as the 16th most frequently cited health priority for rural communities. The Midwest (n = 326), Northeast (n = 129), West (n = 224), and South (n = 339) regions ranked Education Access and Quality 20th, 15th, 15th, and 13th respectively. Respondents in states that had not adopted Medicaid expansion (n = 298) ranked Education Access and Quality 20th while respondents residing in states which had adopted Medicaid expansion (n = 720) ranked it 16th. Both male (n = 205) and female (n = 725) groups ranked Education Access and Quality as the 16th most important priority.

Different age groups prioritized the Education Access and Quality topic quite differently. Eighteen- to 34-year-olds (n = 113) ranked Education Access and Quality 9th. Thirty-five- to 64-year-olds (n = 652) ranked Education Access and Quality 17th. Respondents age 65 years and older ranked Education Access and Quality 13th. Further variations were demonstrated between White respondents (n = 867) and respondents of color (n = 63), as White people ranked Education Access and Quality 16th and people of color ranked Education Access and Quality 11th.

Variations in rankings were also found based on the profession of the respondent. Practitioners in education (n = 129), government and public administration (n = 56), health care (n = 602), human services (n = 96), and other fields (e.g., agriculture, business management and administration, housing, etc.) (n = 107) ranked Education Access and Quality 9th, 27th, 21st, 11th, and 15th respectively.

Finally, rural stakeholders in critical access hospitals (n = 162), federally qualified health
centers (n = 56), rural health clinics (n = 281), rural hospitals (n = 213), and rural public health agencies (n = 89) ranked Education Access and Quality 23rd, 20th, 25th, 15th, and 21st respectively.17

**PREVALENCE AND DISPARITIES IN RURAL AREAS**

This section identifies and assesses the statistics, data, and trends between rural and nonrural schools to understand the contextual disparities in high school graduation rates, number of high school graduates in college the October after graduating, and the rate of proficiency in reading and math at the 4th and 8th grade levels.

Rural high school graduation rates range from 76.4% in New Mexico to 94.2% in Connecticut with the estimated average being 88.7%, which is four percentage points higher than the national average for all locales.2 It is important to note, however, that both urban and rural schools have had declines in graduation rates between the 1980s and 2000s.18 Factors that result in successful high school graduation in rural areas include socioeconomic status and academic progress through the 9th grade, which illustrate the interrelationship between graduation rates, academic achievement, and socioeconomic status.19,20 However, rural schools experience higher rates of poverty compared to their suburban peers.15,18 The U.S. Department of Health and Human Services creates benchmarks to define poverty based on the following factors: persons per household, pre-tax income, and locale (i.e., the 48 contiguous states, the District of Columbia, Alaska, and Hawaii).21,22 In 2023, for example, a four-person household within the 48 contiguous states/District of Columbia has a poverty threshold of $30,000.22 The rate of rural poverty is problematic and pervasive.

Poverty negatively impacts per-pupil funding since local funding sources (i.e., property taxes) are lower in these school districts compared to wealthier districts.23 The disparity in funding sources creates inequities between districts.23 Student enrollment drives school funding too.24 Rural schools receive less funding than their urban peers by 20-50% because of their relatively low student enrollment numbers.24 The disparity of funding harms rural schools; as an example, the funding disparity between rural and urban schools results in lower teacher salaries in rural schools compared to their urban counterparts.4,15 This impacts rural teacher recruiting and retention.4 Consequently, schools are unable to fill vacancies leading to fewer course offerings and teacher shortages in hard-to-fill vacancies like STEM (science, technology, engineering, math) and ELL (English language learners) areas.1

Furthermore, mental health disorders negatively impact high school graduation rates.25 Compared to urban students, rural students have higher rates of suicide and display more mental health symptoms.26,27 Inadequate funding and access to mental health professionals prevent rural schools from better addressing the mental health needs of their students.28

Rural schools perform marginally better than nonrural schools on the National Assessment of Educational Progress (NAEP), which measures student proficiency in reading and math at the 4th and 8th grade levels, by 0.018 standard deviations.2 However, rural students have a lower rate of improvement compared to the national mean for the same set of NAEP exams.2 Interestingly, rural students perform better than nonrural students on reading and math state tests initially, in kindergarten, but fall behind nonrural students by the 8th grade.3 Learning rates during non-summer months are similar within rural and nonrural contexts, but rural students experience larger learning losses during the summer months than nonrural students. This suggests the need to allocate resources during the summer months in forms of academic enrichments, interventions, and programs to improve reading and math assessment scores.3 Figure 1 demonstrates the widening math and reading achievement gap between rural and nonrural school contexts. Please note that the values refer to the differences in standard deviation between rural and nonrural students; a positive difference favors rural students, and a negative difference favors nonrural students.3 Figure 2 compares the rate of learning during the summer and non-summer months for rural and nonrural school contexts.

To maximize funding and improve teacher recruitment, an increasing number of rural...
districts are opting to go to a four-day work week schedule, which may influence student performance in math and reading test scores. Rural schools make up 90% of the school districts adopting a 4-day work week schedule. Math and reading achievement scores in grades 4 and 8 are lower in 4-day work week schools compared to 5-day work week schools. However, when comparing the weekly hours in school, the “middle” and “high” time 4-day work week schools (i.e., 31.03 and 32.14 weekly hours respectively) had no significant differences in 4th and 8th grade math and reading achievement scores compared to 5-day work week schools. The correlation between 4th and 8th grade reading and math achievement scores on tests relates more to the hours per week in school rather than the days per week in school.

Students who attend rural schools have lower college enrollment rates in the first fall after high school graduation than their suburban or urban peers though the gap between them is narrowing. Rural students also delay their college attendance more than nonrural students. These gaps grow when considering differences in socioeconomic status. College recruiters may neglect to engage in rural schools due to their small student enrollments and remote nature. Further, rural students may travel long distances to colleges for preliminary visits as there are typically fewer colleges nearby their homes compared to their urban peers. The limited course offerings and programs, as mentioned earlier, make the transition into college more difficult due to the lack of rigorous courses that emulate the expectations of college coursework. Students can connect with higher education institutions and earn post-secondary credits online (which may increase college attendance). However, there is a digital divide between rural and nonrural communities as fewer families have access to technology in rural communities compared to nonrural communities. School budgets limit the addition of technology into the classroom, which illustrates the connection between funding, technological resources, and college enrollment rates. Finally, there is a relationship between 8th grade student achievement and rates of initial college enrollment and attendance.
Therefore, improving student achievement in reading and math in the 8th grade, as this chapter discusses, also improves the rate of initial college enrollment.38

VARIATIONS BY RACE AND ETHNICITY

Poverty is the single best predictor of student achievement.39 The rural Black poverty rate is 32%.7 The rural Native American poverty rate is 31%.7 The rural Hispanic poverty rate is 24.5%.7 The rural White poverty rate is 13.5%, and the urban resident poverty rate is 12.9%.7 These statistics demonstrate a problematic poverty gap between White students and students of color, which we need to address.

To specifically expand upon the consequences of poverty for students of color, the higher rates of poverty result in differences within student achievement as students of color, specifically Hispanic and Black students, underperform at higher rates on standardized tests compared to their White counterparts; this may go unnoticed due to the small population of students of color in predominantly White rural areas.1,7,15 However, Black and Hispanic students perform closer to their White peers compared to their nonrural schools as demonstrated in Figures 3a and 3b.3

While students of color continue to increase in educational attainment, there remains a persistent disparity in educational attainment between White students and students of color in rural communities as demonstrated by Figure 4.8

VARIATIONS BY REGION

Student achievement scores in grade 3 and learning rates between grades 3-8 demonstrate the variation of educational access and quality in different U.S. regions.40 For example, “In New England, the average rural student is performing one grade level higher than the national average for all students; the opposite is true for the West Coast, where the average rural student is performing one grade level below the national average. Rural districts in the South and West U.S. regions tend to have low test scores.”40 Further, more geographically isolated rural regions have lower 3rd grade student achievement scores and learning rates compared to their less isolated rural peers. Interestingly, when accounting for socioeconomic status, the slower learning rates
are attributable to fewer available resources. Barriers, such as economic deprivation, regional policies, racism, fewer opportunities/resources for differentiated instruction, and difficulties employing teachers with high levels of education, also explain the differences with student achievement in more isolated regions. Finally, different states have different rates of poverty, which influence student achievement as previously discussed. Figure 5 presents the percentage of students by state eligible for free or reduced lunch during the 2013-2014 school year; these statistics illustrate the different rates of poverty for each state.
Thus, different rural regions have different educational achievement and learning rates because of their unique regional conditions. This chapter provides two examples of the differences between rural regions.

The first example is a case study of an Appalachian school, which experiences a high rate of poverty and lags in high school and college graduation rates when compared to the national average. Specifically, the lack of parental involvement, poverty, failed practices of grade retention by districts, lack of role models, disconnection between home and school expectations, lack of educational resources to meet students’ basic needs, and perception of education being inconsequential in daily lives are barriers to high school graduation within this case setting. For students that wanted to attend college, they either failed college entrance requirements or were required to take remedial math and reading courses. The latter resulted in more barriers to earn a college degree, which could motivate student attrition in college.

Conversely, Illinois has more rural students than the national average but performs better than their national and rural counterparts. Low racial diversity, low poverty rates, and stable residences characterize rural schools in Illinois. They perform better than the national and rural averages on NAEP reading and math tests in grades 4 and 8, despite high transportation costs, inequitable school funding, and low teacher salaries relative to the rest of the U.S.

**BARRIERS**

This section summarizes and builds upon the constraints found in rural schools that inhibit the growth of the following metrics: high school graduation rates, high school graduates in college the October after graduating, and proficiency in reading/math skills at the 4th and 8th grade levels. Schools in rural communities face challenges in recruiting and retaining highly qualified teachers including specialized areas, such as ELL and STEM. To fill high-need roles, schools hire less qualified or new teachers that can negatively impact student achievement and attainment. Teachers in rural schools have limited access to professional development. Furthermore, administration must take on multiple roles and capacities that would be delegated to other professionals in larger schools.

**Figure 4. Education Attainment Disparities between White Students and Students of Color in Rural Communities**

<table>
<thead>
<tr>
<th>Year</th>
<th>White</th>
<th>Black or African American</th>
<th>American Indian or Native Alaskan</th>
<th>Hispanic, any race</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>16</td>
<td>7</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>2018</td>
<td>21</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

Bar: Bachelor’s Degree, Orange: High school, some college, or associate’s degree, Blue: Below high school
Rural schools have less funds to address student and school needs, which impact the decision-making and delegation of resources in the school. Another barrier is the lack of attention rural schools attract in research and state/national policy discourses, which minimize the published solutions, guidelines, or recommendations that schools can utilize to address barriers or needs.

Rural students and/or families have limited access to advanced coursework and digital resources, live further from colleges and other amenities compared to nonrural settings, and experience both higher rates of poverty and deep poverty (i.e., income falling below half of the poverty line). These factors negatively influence academic achievement and attainment. Further, students of color typically experience higher rates of poverty, which influence their academic achievement and educational attainment. Finally, rural students present more mental health issues, including higher rates of suicide, than their urban peers but also have fewer resources to address their mental health needs.

Globally, student achievement and attainment declined during the COVID-19 pandemic especially in low-income areas. Rural schools fill a larger role in students’ lives within their communities, and during COVID-19, these schools, for example, provided and transported meals to local families, navigated the tension between conducting school within remote or in-person learning environments, and designed supports for students’ mental health needs. Lower socioeconomic students were more severely affected during COVID-19 (e.g., learning loss, fewer remote resources, etc.). Additionally, people experienced more mental health needs during COVID-19; however, rural people had fewer accessible remote resources to address their needs, such as telehealth, due to the digital gap within rural and nonrural communities. Due to rural communities’ high concentrations of poverty, the problems and barriers during COVID-19 may continue to widen the educational gap for years following the pandemic.

PROPOSED INTERVENTIONS

Despite pervasive and systemic issues in rural schools, rural communities have more agency in creating positive changes due to the larger influence individuals, schools, and community stakeholders have regarding decision-making in low population areas. This section offers solutions and interventions to address the needs of rural schools and elevate the educational opportunities and outcomes for rural students.
Improvement in teacher recruitment and retention can help elevate student achievement. Strategies to improve teacher recruitment and retention in rural schools include:

- active recruitment (e.g., administrators attending college fairs, word of mouth, personal contacts, grassroot efforts, highlighting rural advantages like smaller class sizes, closer networks of support, teacher autonomy);
- context-specific training;
- hiring local teachers;
- incentives for retention;
- collaboration between rural schools and universities;
- administrative/ peer mentorship and support;
- induction programs/ supports (e.g., beginners’ seminars, collaborations with colleagues and administrators, teacher aides, reduced course load).

Instructional strategies to improve math and reading achievement scores in grades 7-12 include project-based learning, small group instruction, and progress monitoring.

For grades 4-12, strategies to improve literacy skills include active monitoring, graphic organizers, questioning, summarizing, and paraphrasing. Academic performance in math and reading can be elevated through instructional activities that implement student self-reflection components (i.e., students develop awareness of their current knowledge and create goals to address academic deficits).

Providing access to guidance counselors and financial aid information can make college more attainable for students in poverty. Further, the use of blended or online learning can provide opportunities for dual credit or advanced placement courses to help provide more collegiate access for rural students.

To improve professional development within a rural context, rural school leaders should situate the learning goals of the session within their context (e.g., cultural dynamics and meaning, everyday life), develop and maintain open and sustained dialogue (e.g., professional learning communities, collaboration between teachers and school leadership), and promote self-reflection (e.g., data-based evaluation, reflective inquiry). Together, these features can serve to improve the instructional capacity of teachers, which may result in better student learning and achievement outcomes. Putting teachers into school improvement or leadership roles can help build teacher agency, afford teachers a voice in school changes, foster collaboration and shared decision-making, help address school needs, and build teachers’ sense of support. The use of these professionally-supported strategies may help improve school-based outcomes, such as educational attainment.

Rural schools need to be creative in managing their costs since they have fewer funds than urban schools to address their needs. Navigating student transportation options is one such avenue to reduce total costs. Advocating for more public transportation options and routes, encouraging pre-existing public transportation vehicles to stop by schools throughout the day, and recruiting volunteers to drive buses can reduce school costs associated with student transportation to and from school.

To improve the structural inequities faced by minoritized racial and ethnic groups, school leaders must:

- listen to local experts, including experts of color;
- address the unique social, political, historical, and economic challenges of the region;
- advocate for resource distribution toward the most needed populations;
- collaborate with organizations that combat poverty;
- organize leadership and representation for all racial and ethnic constituents in the community;
- advocate for rural organizations that support communities of color;
- consider indicators of success that focus on the unique inequities in the region.

School-based health centers focusing on mental health have a positive impact on graduation rates. Features of effective school-based health centers include staff and student trainings on identifying signs of mental health problems, referral systems to receive help, strategies for crisis intervention, and outlets to receive mental
health assistance. To further address issues of mental health, rural schools must:

- raise awareness of mental health issues in the school and community;
- use universal screenings to identify and treat students with early indicators of mental health issues;
- refrain from the use of punitive measures (e.g., Zero Tolerance);
- provide an option for mental health screening/treatment as an alternative to punitive measures;
- implement systematic student support programs, like the Multi-Tiered System of Supports framework, to involve practitioners that collaboratively target and resolve the academic, social, and emotional needs of the school’s most vulnerable students.

Rural schools historically are underrepresented in research and policy. Thus, this chapter recommends advocating for resource equalization (e.g., improved funding) as the continued investment into the discussed barriers improves the conditions associated with educational attainment and student achievement.

**COMMUNITY MODELS KNOWN TO WORK**

This section presents three promising community models whose use may improve the constituents and/or metrics associated with K-12 student achievement, graduation rates, and/or initial college attendance after high school graduation.

**Maslow’s Hierarchy to Support Struggling Schools**

Fairway Elementary School in Kapp County is in the South-Central region of the U.S. Kapp County is one of the 100 poorest counties in the U.S. The school underwent a turnaround with academic performance between the years of 2008-2016. School leadership built upon Maslow’s Hierarchy of Needs framework as demonstrated by Figure 6. Their conceptual framework aims to rank and support the most essential student needs. The lowest level of the pyramid represents the most essential needs; the next lowest level presents the next set of the most essential needs, and so on.

To address the specific and essential needs of their students, the school leaders also conceptualized the Educational Intervention System, which aims to:

- involve all stakeholders in diagnosing issues and implementing classroom interventions;
- provide schoolwide intervention groups to improve the academic, emotional, or social deficits;
- create one-on-one engagement opportunities;
- tackle community and familial problems;
- improve school climate.

In 2008, they were in the bottom 10th percentile in academic performance in their state. By 2016, the school ranked in the 90th percentile in academic performance within their state.

**Professional Learning Communities**

Increasing the number of collaborative interactions between educators improves student achievement. One model to integrate more teacher interactions is through professional learning communities (PLC). This model involves groups of teachers who collaborate to identify student problems and test solutions. A rural Texas elementary school implemented a PLC system to improve instructional and institutional practices. Having a PLC system in the school provided insight into problematic teaching practices that inhibited student achievement. They conceptualized an action plan to reduce the deficits.

**Summer Literacy Academy**

To mitigate summer learning loss, a Title I rural school district in Minnesota implemented the Summer Literacy Academy to improve student literacy skills for students in grades 4-7. In groups of 10-12 students, the classes engaged in research-based literacy pedagogy (e.g., teacher read-alouds with writing, small group shared reading, independent reading with teacher conferencing, readers’ theater) over the course of four weeks. Each week introduced a new genre (i.e., fiction, nonfiction, poetry, and biography). To ensure equity, the program provided transportation and meals (i.e., breakfast and lunch) to students. Students received two additional books upon the conclusion of the program to further promote reading outside of the school context. Each grade level in the
Summer Literacy Academy either experienced learning gain or smaller amounts of learning loss in literacy compared to previous student cohorts.  

SUMMARY AND CONCLUSION

There are encouraging trends in rural schools when compared to nonrural schools. For example, rural schools outperform urban schools in graduation rates. They outperform nonrural schools in the NAEP 4th and 8th grade math and reading achievement test scores.

However, other trends are less encouraging, such as higher poverty rates in rural schools compared to suburban schools, fewer students attending college the first October after high school graduation, fewer course offerings and interactions with colleges, larger learning losses during the summer months compared to nonrural schools as a result of fewer summer learning opportunities, higher rates of mental health crises compared to their urban counterparts, and fewer opportunities to access technology when compared to nonrural schools. There are disparities with students of color compared to White students in rural regions as students of color experience higher rates of poverty, lower educational attainment, and lower student achievement compared to rural White students.

Finally, the South and West regions in the U.S. tend to have higher rates of rural poverty compared to the other U.S. regions, which compromises educational attainment and student achievement.

Rural barriers, such as isolation, high rates of poverty, and fewer funds to recruit/retain quality teachers and address the school's deficits, create difficulties to reverse the problematic trends in student achievement and attainment. The interventions and community models aim to overcome these barriers to ensure that our rural students have better educational access and quality. In turn, these improvements may result in a healthier rural community.

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Related Chapters:
Chapter 18. Rural Health Issues in Child and Adolescent Development

Suggested Chapter Citation:
HEALTH INSURANCE FOR RURAL AMERICANS

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SCOPE OF THE PROBLEM

- Access to health insurance has improved over the last decade, especially in the southeastern United States, but the Healthy People 2020 goal to increase the proportion of individuals with health insurance coverage was not met.

- More than 27 million people in the U.S. remained uninsured in 2022. Compared to 2012, this reflects a decrease in the number of uninsured by 46 million. The introduction of the Affordable Care Act in 2014, alone, has been credited with a decrease of 30 million uninsured individuals by 2020.

- The uninsurance rate remains elevated, particularly for rural populations, especially in the 10 states that have not expanded Medicaid.

- While disparities in health insurance coverage have declined for Hispanic and Black individuals compared to White individuals, these populations remain less likely to have health insurance coverage.

The Affordable Care Act (ACA) passed in 2010 and its major components implemented in 2014 represent the largest change in the health insurance market since the inception of Medicaid and Medicare. The primary goal of the ACA was to reduce the number and proportion of uninsured individuals through the creation of individual health insurance marketplaces, a mandate to obtain health insurance coverage, and the expansion of Medicaid coverage for individuals with incomes up to 138% of the federal poverty level (FPL). However, not all states expanded Medicaid. Starting in 2014, 25 states and the District of Columbia expanded Medicaid coverage, and 13 states expanded at a later date, leaving only 10 states who had not expanded Medicaid coverage by 2023. These coverage expansions took effect in 2014, but earlier efforts such as the expansion of dependent coverage, which allowed individuals between 19 and 26 years of age to remain on their parents’ health insurance plans, and early Medicaid expansions in six states already impacted the uninsurance rate in 2011 and beyond.

It is estimated that the ACA decreased the uninsurance rate by twelve percentage points and provided health insurance coverage to about 15 million individuals below the age of 65 (Figure 1). While estimates vary, the individual marketplace has been credited with about half of the increase in health coverage. The dependent child coverage provision has also been credited with increased insurance for young adults. In addition, it is estimated that of the approximately 52 million rural residents in 2015, 4.5 million gained coverage through the ACA. However, efforts to reduce the number of rural uninsured persons remain important, as 12% of rural residents remain uninsured.

The growth in health insurance coverage led to gains in access to primary care and further improvements in quality of care, given the requirement of marketplace plans to cover essential health benefits (as defined by each state). A growing body of studies have shown that the ACA improved access to primary care. For example, a study by Wherry and Miller (2016) shows that ACA Medicaid expansion led to an increase in the probability of having an office visit. As of 2021, about 88% of individuals report having access to primary care, though prevailing disparities between rural and urban areas still persist.

The coverage gains also led to higher rates of dental insurance coverage, as more-than-emergency dental care is often included in...
Medicaid benefits, and can also be purchased on the marketplace concurrently with medical plans. Starting in 2014, dental coverage rates increased, as did the share of individuals who had a dental visit. While it is likely that these benefits also improved access to dental care and outcomes for rural residents, to date, there is limited evidence on how rural residents were affected.

Challenges to accessing affordable insurance and healthcare remain. Medicaid and marketplace health plans often include only small provider networks, leading to longer commutes for individuals seeking care, especially for specialty care. At the same time, many rural areas experience few health plan options, as insurers left the marketplace in many rural areas starting in 2016, thus limiting choice for consumers and competition among insurers. This could be attributed to the fact that many rural areas have their own individual marketplace rating area separate from other more populous areas. Rating areas are geographic areas that define consumer boundaries in which insurers can compete for business. To improve access to marketplace plans, some states, such as Texas, have begun to aggregate rural rating areas into urban rating areas starting in 2023. Increasing the size of the potential market may lead to a broader risk pool while providing more health plan options to rural individuals.

**RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES**

**Healthy People 2030 Objectives**

Access to health insurance is critical to monitor health status and to obtain necessary medical care to treat acute and chronic diseases. The high cost of healthcare has encouraged people without health insurance to forego or delay preventive services and primary care. They often seek care in the emergency department or in locations where charity care is available. This suboptimal care-seeking behavior has dramatic consequences and produces inadequate disease management, poor health, and a higher risk of preventable morbidity.

Through its Healthy People program, the U.S. Department of Health and Human Services establishes national goals and objectives, every decade, to improve the health of all Americans. The Healthy People 2030 objectives for the topic of Health Insurance, that will be addressed in this chapter, are:

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**Figure 1. Display Trends in Health Insurance Coverage from 2010-2022, National Health Interview Survey**

Insured Share of U.S. Nonelderly (%), 2010-2022

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---|---|---|---|---|---|---|---|---|---|---|---|---
81.8 | 82.7 | 83.1 | 83.4 | 86.7 | 89.5 | 89.6 | 89.3 | 88.9 | 87.9 | 88.5 | 89 | 90.1

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248 Rural Healthy People 2030
Affordable Care Act Continues to Address Disparities in Health Insurance Coverage, Dental Insurance, and Primary Care Access

The ACA remains one of the most influential laws to increase insurance coverage rates since the introduction of Medicaid and Medicare in 1965. Nevertheless, 27.5 million individuals remain uninsured, and it is estimated that more than 3.5 million uninsured individuals would receive coverage if the remaining states expanded Medicaid for those making less than 138% of the FPL. Future state Medicaid expansions could particularly enhance coverage gains for rural residents, as the remaining states that chose not to expand Medicaid to-date have disproportionately large rural populations.

Based on existing evidence, expanding health insurance coverage can lead to increases in primary care access. Challenges remain, including a potential lack of primary care providers that accept new patients and getting appointments in a timely manner. Expanding Medicaid coverage has shown to increase primary care access, even for newly covered individuals seeking an initial appointment. The growth in access has been aided by the higher Medicaid reimbursement rates introduced with the ACA. At the same time, the cost of primary care, especially in a healthcare market in which hospitals are vertically integrating primary care practices, has increased the out-of-pocket cost for patients. Thus, it is imperative to view access to primary care concerns through the lens of growing cost pressures.

At the same time, dental coverage rates remain relatively low compared to medical insurance rates - about 70% of individuals have either private or public dental coverage while medical insurance rates are hovering around 90%. While the ACA provides opportunities to purchase dental insurance (combined with medical insurance) on the marketplace, only about 9.8 million individuals gained dental insurance coverage. Dental healthcare needs remain especially high among seniors. A report by the Urban Institute suggests that only 27% of Medicare beneficiaries’ dental costs are covered by insurance. As such, lawmakers have proposed to expand dental coverage for all Medicare
beneficiaries. There is evidence indicating that access to dental care has disproportionately improved in states that expanded Medicaid and offered more generous dental benefits in Medicaid, compared to those that did not.\textsuperscript{60-67} In addition, there is evidence suggesting that dental-related emergency department visits decreased only in Medicaid expansion states with more generous Medicaid dental benefits, while emergency department visits rose in both expansion states without dental benefits and non-expansion states, indicating that Medicaid expansion’s impact on access to dental care is contingent on the provision of adult dental benefits.\textsuperscript{68}

**RURAL HEALTHY PEOPLE 2030 SURVEY**

In the Rural Healthy People 2030 survey, conducted in 2021-22 by Texas A&M University, health insurance was ranked as a top 20 health priority by rural stakeholders.\textsuperscript{69} Access to regular quality medical and specialty care, such as addiction and mental health care services, were identified as the most important health priorities in all census regions. This is not surprising given the opioid and drug epidemic in the U.S.\textsuperscript{70}

Further, access to healthcare remains a top issue across demographic groups and fields of employment, reflecting the overall perception that healthcare access is not adequate. As such, it is important for stakeholders, insurers, and policymakers to focus on providing insurance products that provide broad access to care.

**PREVALENCE AND DISPARITIES IN RURAL AREAS**

Urban-rural disparities in health insurance coverage have long been documented in the U.S.\textsuperscript{71,72} The ACA provided uniform access to insurance for working-age adults making between 100 to 400\% of the FPL, thereby reducing the non-elderly rural uninsurance rate from 24\% in 2010 to 16\% by 2019.\textsuperscript{11} However, rural residents generally have lower insurance rates compared to urban residents (Figure 2), with a growing insurance disparity from highly urbanized areas to very rural areas. A 2014 Kaiser Family Foundation report outlines a number of important reasons for the disparity in insurance coverage.\textsuperscript{73} A reason for coverage disparity can stem from the fact that rural populations tend to be less likely to have employer-sponsored health coverage.\textsuperscript{73} Another driving force is the lack of Medicaid coverage for low-income individuals in

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**Figure 2. Trends in Health Insurance for Urban and Rural Areas\textsuperscript{75}**

![Figure 2. Trends in Health Insurance for Urban and Rural Areas](image_url)
non-Medicaid expansion states. The proportion of individuals qualifying for Medicaid coverage is large, as rural areas tend to have lower wages than urban areas. About 30% of uninsured individuals in rural areas may be eligible for Medicaid or CHIP, and 37% of uninsured rural individuals are within the income range to be eligible for premium tax credits in the marketplaces compared to 32% of metropolitan uninsured individuals. As of 2016, in non-Medicaid expansion states the rural uninsurance rate stands at 32%, compared to 16% in rural areas of Medicaid expansion states. Nevertheless, the uninsured rate for low-income adults in rural areas and small towns dropped 19% in Medicaid expansion states and 6% in non-expansion states between 2009 and 2016.

Disparities between urban and rural dental insurance coverage rates are large. This is demonstrated in Figure 3 where 2019 data on adults with a dental visit in the past 12 months are presented by urbanicity and gender. More recently, a study by Luo et al. (2022) showed that 54% of urban residents had dental coverage, compared to only 35% in the most rural areas. General dental visits and preventive procedures displayed a smaller gap for urban and rural areas. Urban residents were more likely to have preventive procedures than rural residents, but total dental visits were similar across geography. At the same time, large statewide differences exist in the number of dental providers that accept Medicaid patients, which disproportionately negatively affects lower income and rural areas.

Access to primary care is higher for urban residents than rural residents. Estimates suggest that about 81% of urban individuals have a regular source of care compared to 74% of rural individuals. This disparity is partially driven by lack of primary care providers in rural areas. Nevertheless, the density of primary care physicians increased by 20.8% in urban counties, and 14.3% in rural counties from 2009 to 2017. The disparity in access remains problematic as rural residents have a higher prevalence of stroke, coronary heart disease, and mortality. Disparities in access to care could have been worse with the growing number of rural hospital closures, but rural residents benefit from the existence of rural health centers and federally qualified health centers (FQHCs) to provide primary care.

**VARIATION BY RURAL REGIONS**

Health insurance and dental coverage rates vary across the U.S. Generally, the South has the highest uninsurance rate, while the Northeast and the Midwest have the highest coverage rates (Figures 4 and 5). The proportion of individuals with low income is higher in the South, which can help to explain lower coverage rates. Figure 5 shows that regional percentages of dental coverage ranged from 45.6% to 57.1%, with individuals in the South having significantly lower coverage compared to other regions.

![Figure 3. Dental Coverage for Rural vs Urban Areas across U.S.](image-url)
lower coverage rates than the U.S. average. After the implementation of the ACA marketplace and Medicaid expansions, insurance and dental coverage rates increased across all four geographic census regions, though somewhat stronger in areas with a history of low coverage rates. The same can be said about primary care access (Figure 6).

Within each census region, rural residents are more likely to be uninsured than urban residents and less likely to have a primary care provider. The rural-urban disparities within census regions became smaller after the ACA.

Several factors can contribute to the difference in the remaining coverage rates, such as access to employer-sponsored health insurance, systematic differences in employment opportunities, and the aging of the rural population.

VARIATION BY RACE AND ETHNICITY

Generally, non-White residents are more likely to be uninsured compared to White residents. White and Asian people have the highest insurance coverage rates, 94% and 93%, respectively. American Indian and Alaska Natives have the highest uninsurance rate with 21% being

![Figure 4. Health Insurance Coverage and Source of Nonelderly for Four Census Regions](image)

![Figure 5. Percentage of Adults 18-64 who had Dental Care Coverage between 2014 and 2017](image)
uninsured. When comparing ethnic groups, Hispanic people have the lowest rate of insurance coverage in the U.S. (79%). Uninsurance rates were also similarly higher in rural areas compared to urban areas for minorities. However, the gap in insurance rates between White and non-White populations and between non-Hispanic and Hispanic ethnicity has decreased after the ACA (Figure 7). This was the result of a large increase in insurance rates for all non-White residents.

Dental coverage disparities by race and ethnicity are also prevalent. Racial and ethnic disparities in dental care use have persisted for decades. In 2017-18, 54.8% of White seniors visited a dentist; but only 40.5% of Asians, 31.8% of Hispanics, and 28.8% of Black seniors. However, recent ACA Medicaid expansions that included coverage of dental services for adults have helped reduce these disparities. Figure 8 shows narrowed racial and ethnic disparities in dental care visits and use of preventive and treatment services after the ACA.

Disparities in access to primary care by race and ethnicity are also well documented (Figure 9). A report by the Centers for Disease Control and
Prevention, displaying trends in health care access and use from 2002-2015, reported that Hispanics were the least likely to have a primary care provider (61.5%), followed by American Indian and Alaska Native (63.7%). Low primary care access translated into Hispanics reporting a higher rate of foregone medical needs due to cost. Given the growth in the non-White proportion of rural residents across the U.S., one can expect that access to care remains a challenge for Blacks, American Indians, Native Americans, and Hispanics.

**IMPACT ON MORTALITY & MORBIDITY**

Both the young and healthy (generally under the age of 34), and individuals with morbidities, have historically seen higher rates of uninsurance. The ACA provision to allow those under the age

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**Figure 8. Dental Care Access by Race and Ethnicity Trend from 2005-2018**

![Graphs showing percentage with a dental visit in the past year for children, adults, and seniors by race/ethnicity from 2005-2018.](image)
of 26 to remain on their parents’ plan, and the marketplace-guaranteed issue mandate, provided many young individuals and those with chronic disease access to insurance. The lack of health insurance can have many health consequences that materialize over short- or long-term time periods. At the same time, growth in healthcare costs led employers to require larger employee contributions for health plan premiums. Lower preventative and primary care physician visits have been documented for the uninsured compared to the insured. Growing access concerns for rural residents, especially in a healthcare system in which rural hospitals and health care systems are commonly closing, leads to an especially worrisome scenario. Adequate preventative care can lead to early detection of disease that can preserve health and postpone negative health consequences. Additionally, lack of outpatient access can lead to inadequate disease management, which increases the chance of lower quality of life, hospitalization, and death. An analysis of 2016 state-level data shows, except for three states in the U.S. (Montana, Wyoming, and Colorado), that rural areas had a higher mortality rate than urban areas. However, these rates varied significantly across different states. The primary causes of this higher mortality rate in rural areas at the state level were lack of health insurance, socioeconomic deprivation, and a shortage of physicians.

Further, the value of insurance has been well documented in a recent randomized trial by Goldin et al. Within this trial, information pamphlets were randomly sent to uninsured individuals who qualified for a free health plan on the ACA marketplace. The researchers found that this outreach led to increased insurance coverage and reduced mortality among White individuals aged 45 to 54. Thus, insurance coverage can save lives in the near future. These findings may imply that similar outreach efforts to rural residents, who exhibit high healthcare needs, may lead to similar results.

BARRIERS

The ACA improved access and lowered cost barriers for insurance enrollment. For the first time, individuals without access to employer-sponsored health insurance were able to purchase...
health plans that are highly subsidized by the federal government. Beginning with the 2021 calendar year, subsidies for these plans were expanded to levels not seen before. Specifically, individuals making less than 150% of the FPL qualified for a free health plan, and out-of-pocket premium contributions were evenly capped at 8.5% for the highest income households. As such, one of the largest access barriers to insurance, the cost of health plans, has been substantially reduced for urban and rural residents. At the same time, access to health insurance due to unemployment or job loss has been

Figure 10. State Mortality Rates

Deaths per 100,000
- Fewer than 730
- 730-65
- 766-823
- 824-930
- More than 930

Deaths per 100,000
- Fewer than 730
- 730-65
- 766-823
- 824-930
- More than 930

No rural counties
eliminated, as individuals can qualify for the ACA marketplace plans following changes in job status. Barriers to health insurance coverage remain for parents and single low-income individuals, especially those making less than 100% of FPL. In non-Medicaid expansion states they do not qualify for ACA marketplace subsidies, therefore making insurance coverage unaffordable on the exchange.

Further, low-income individuals' employment generally does not offer health insurance or the plans are less generous. This is the case due to part-time employment, self-employment, or employment at a small company, which are exempt from providing health coverage to employees. Even when offered the same health plan, low-income individuals may underutilize care. Rural residents are generally less likely to be employed full time and more likely to be employed by small employers, thereby automatically limiting access to health coverage from public programs, such as Medicaid, or the ACA marketplace.

Competing barriers to health coverage can also be attributed to language barriers, educational attainment, health literacy, and trouble navigating the health insurance enrollment process. Research has also reported that these barriers are especially prevalent among rural residents when compared to urban residents. At the same time, the benefit of buying health insurance for rural residents may be large, given the high cost of healthcare services and the low disposable income of rural residents.

The growing share of out-of-pocket expenses for healthcare services is a growing problem for individuals. High-deductible health plans have been growing in popularity over the last 15 years. While they offer lower premiums, they are associated with substantially higher out-of-pocket costs. As such, a growing literature has shown that these health plans lead to lower healthcare utilization, even in instances where healthcare services are fully covered by the health plan without out-of-pocket cost to the patient.

The growth in coverage led to increased access to primary care; however, distance and health plan network limitations remain barriers. This is especially true for rural residents, who have higher likelihood of reporting that they have foregone care due to provider distance or lack of provider availability. Among adults ages 50 to 64, 15% living in rural areas had to forgo health care due to cost versus 13% of those living in urban areas. While distance can be overcome with time commitment and adequate transportation, many rural residents report that they do not, in fact, have reliable transportation available to them.

Although the growth in telemedicine can alleviate needs for travel, a lack of broadband access in rural areas has slowed the growth of telmedicine use. Specifically, 39% of the rural population (compared to 4% of the urban population) do not have access to reliable internet and, therefore, cannot utilize the opportunity to get timely primary care through an electronic medium.

Barriers for dental care remain large for those without access to employer-sponsored dental plans. The provision of adult dental benefits in Medicaid is optional, and only a few states offer comprehensive and generous dental benefits to Medicaid enrollees.

In summary, affordability and limited benefits can all contribute to making health coverage less appealing for individuals. High premiums or deductibles can make health plans unaffordable for many people, particularly those with lower incomes. Plans with limited benefits may not adequately cover the healthcare needs of individuals, leading them to seek care elsewhere or forego necessary care altogether. These factors can result in lower rates of health and dental coverage, lower primary care access, and may negatively impact health outcomes in the long term.

**PROVEN SOLUTIONS OR INTERVENTIONS**

There are several important suggestions aimed at improving health insurance coverage rates. First, the largest growth in insurance coverage was observed for states which expanded Medicaid. As such, expanding Medicaid should yield substantial growth in health insurance enrollment among low-income and rural populations. Second, outreach programs that provide awareness of existing health insurance resources have been shown to be effective in enrolling individuals
in Medicaid and marketplace health plans. For example, the ACA navigator program has been linked with increased enrollment in marketplace coverage. Navigators are individuals affiliated with organizations that help consumers to review personalized health insurance options and navigate the enrollment process (including the completion of eligibility and enrollment forms).

Third, television and other advertisements of insurance plans available to individuals have been associated with increased enrollment. Lastly, the largest and most important aspect to increasing enrollment has been the price of the health plan. The recent expansion of health plan subsidies for marketplace plans has led to an increase in coverage rates, especially in rural areas which have the highest rates of uninsurance. Thus, maintaining affordable premiums remains an important solution to enable individuals to purchase health insurance coverage.

Improving access to primary care has been a longstanding policy priority for states and the federal government. Urban access to primary care is less of a concern, as the majority of health care providers tend to gravitate towards urban centers. The establishment and growth of rural health clinics and FQHCs demonstrates an effort to provide timely and high-quality healthcare to rural residents. Even in the perceived presence of adequate primary care access, network limitations may lead to limited access to specialty care. As such, it is important to require insurers to provide health plans with enough in-network providers that allow patients to seek timely care.

An immediate opportunity to improve access to primary care, especially for rural residents, is the growing adoption of telemedicine by providers. Telemedicine, the use of electronic devices, can be used to deliver health care services and transmit medical information between providers and patients. The benefit of telemedicine is that it reduces the distance burden to receive care and improves the opportunity to provide care for acute conditions without delay due to travel. Telemedicine allows hospitals and primary care providers to expand the scope of their services and potentially increase the number of patients seen. Telemedicine seems especially promising for rural residents, though barriers to telemedicine due to a lack of access to broadband services remain widespread.

Other promising avenues to improve access to primary care include improving existing channels of primary care delivery. The patient-centered medical home (PCMH) model relies on the idea of strengthening practice capabilities to expand access to care and delivering high quality primary care through an integrated care delivery model that focuses on improved care coordination, chronic condition management, and the expansion and use of health information technology. Evidence suggests that certain capabilities of the PCMH model are especially well suited to improve primary care, while also reducing overall healthcare spending.

Reducing licensure requirements is also a potential avenue to increase access to healthcare professionals. The traditional model of requiring a physician to be responsible for patient care limits access to primary care services. To reduce primary care shortages and resulting long appointment times, the role of nurse practitioners and physician assistants has been expanded substantially through changes in state laws. To improve their scope and autonomy, states have passed legislation to reduce licensing restrictions, allowing nurse practitioners and physician assistants to practice with less physician oversight.

Solutions to increase dental coverage rates and access to dental care include improved outreach and communication about subsidized preventive oral care available for low-income individuals and rural areas. In some states, only emergency dental benefits are available for those covered by Medicaid. This can lead to suboptimal care management and increase the total healthcare cost for oral care long term, as preventative treatment could have avoided the escalation of acute care needs. Therefore, states should consider the inclusion of more generous dental benefits in Medicaid plans. Finally, the limited number of dentists who accept Medicaid enrollees can be addressed in part by increasing Medicaid payment rates. For Medicare members, expanding...
affordable options to purchase dental coverage may come from federal policy considerations. Options could include expanding Medicare to provide dental coverage plans in a similar fashion to the expansion of prescription coverage, i.e., Medicare Part D.

SUMMARY AND CONCLUSIONS

The ACA expansion increased access to health insurance and led to the historically lowest rate of uninsured people in the United States. However, access issues remain, especially in states that did not expand Medicaid and which have much larger rural populations. Thus, many low-income and rural residents still face insurance access/uptake/enrollment issues. At the same time, improving access to primary care remains a challenge, especially for rural communities, as the number of primary care providers is not growing fast enough to provide access to urban and rural residents. New technologies and state licensure law changes have expanded the opportunity to improve access to care; however, whether these changes will meaningfully increase primary care access remains unknown. Finally, dental coverage rates are relatively low compared to health insurance rates, but dental needs remain high.

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Related Chapters:
Chapter 3. Rural Healthcare Access and Quality
Chapter 15. An Examination of the Workforce in Rural America
Chapter 19. Hospital and Emergency Services in Rural Areas

Suggested Chapter Citation:
RURAL HEALTH ISSUES IN CHILD AND ADOLESCENT DEVELOPMENT

By Kelly Wilson, PhD, MCHES®

SCOPE OF THE PROBLEM

- Rural youths have more missed days of school because of illness, including chronic illness, than their urban counterparts. Those with developmental delays are twice as likely than their urban peers to be chronically absent. Children and adolescents with mental health conditions, such as anxiety or depression, miss more school.

- Rural children and adolescents encounter unique barriers to healthcare, which may limit their ability to identify a medical home or access services regularly or on time.

- Depression, behavior problems, and anxiety are prevalent in rural children aged 3-17 compared to children from urban locations.

- Adverse childhood experiences are prevalent in rural communities, yet care coordination, social support services, and access to healthcare are limited.

- Rural children and adolescents are more likely to experience hunger and live in low-income households compared to their urban counterparts. Children and adolescents living in poverty are more likely to experience poor health problems as adults, confront difficulties in school, and live in impoverished neighborhoods.

- In rural dwellings, children are more likely to have an incarcerated parent, and rural adolescents are more likely to live with someone who smokes and live in low-income households, compared to those in urban areas.

- Children and adolescents in rural areas experience higher rates of overweight and obesity, are at greater risk for misuse of tobacco, alcohol, and opioids, and have higher suicide rates compared to those in urban areas.

The growth and development of children and adolescents represents a critical stage in life for achieving human potential. During these developmental phases of life, young people gain physical, cognitive, emotional, and social skills that serve as a foundation for influencing their health and well-being. Physical and social development affect the safety and health of this group, which reflects future challenges to society and our communities.

Receiving timely and regular healthcare services and developmental screening is key to identifying a child’s health problems early, as well as creating opportunities to treat and promote positive health behaviors. Adolescents may experience developmental challenges that affect their physical and mental health and are also at risk of preventable health problems. Addressing developmental concerns and promoting positive health behaviors can help children and adolescents stay safe and healthy and provide a pathway for a population of healthier adults.

The health behaviors, social supports, conditions, and systems in rural communities influence the development of children and adolescents, as well as their health-related quality of life. Young people living in rural communities are affected by multiple factors, including their health status, family income and poverty levels, housing, school, neighborhood environments, and access to developmental screening and health services. The U.S. Department of Health and Human Services'
Healthy People 2030 emphasis on children and adolescents supports the need to improve opportunities for the development and well-being of children and adolescents in the rural United States.\(^9\)

**RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES**

Childhood and adolescence represent critical periods of a person’s development and growth.\(^{20}\) The federal government’s Healthy People 2030 goal to “promote healthy development for children and adolescents” recognizes the need to focus on promoting physical, mental, emotional, and behavioral development.\(^9\) Solutions for improving child and adolescent health include responding to problems and challenges early so children and adolescents can receive the support and resources they need as they develop. Specific objectives of Healthy People 2030, related to child and adolescent development and important for rural health, are addressed in this chapter:

**School Objectives**\(^9\)
- AH-D01: Increase the proportion of trauma-informed early childcare settings and elementary and secondary schools
- EMC-D06: Increase the proportion of children and adolescents who get preventive mental health care in school
- EH-D01: Increase the proportion of schools with policies and practices that promote health and safety
- AH-R06: Increase the proportion of schools requiring students to take at least 2 health education courses from grade 6 to 12
- AH-R09: Increase the proportion of public schools with a counselor, social worker, and psychologist

**Social and Community Context Objectives**\(^9\)
- EMC-D07: Increase the proportion of children and adolescents who show resilience to challenges and stress
- SDOH-05: Reduce the proportion of children with a parent or guardian who has served time in jail
- IVP-D03: Reduce the number of young adults who report 3 or more adverse childhood experiences

**Health Care Objectives**\(^9\)
- MICH-17: Increase the proportion of children who receive a developmental screening
- MICH-19: Increase the proportion of children and adolescents who receive care in a medical home

To avoid duplication of objectives in other related chapters, this literature review does not cover the full scope of Healthy People 2030 Child and Adolescent Development objectives. Rather, it focuses on a limited subset that includes objectives influencing children and adolescent development in school, social and community context, and healthcare.

**RURAL HEALTHY PEOPLE 2030 SURVEY**

Healthy People 2030 focuses on promoting healthy physical, mental, emotional, and behavioral development in children and adolescents. The emergence of this Healthy People 2030 goal to promote healthy development for children and adolescents as a ranked rural health priority area signifies the importance of young people in rural America. Of nearly 1,300 rural stakeholders recently surveyed, one-fifth (20.6%) ranked this Healthy People goal as a top ten priority for rural America, ranking it as the 18th highest overall rural health priority. The Healthy People special-population categories of “Children” and “Adolescents” also emerged in the rural stakeholder survey as the second and third (54.3% and 40.9%, respectively) priority populations, behind “Older Adults” (70.1%).\(^\text{21}\)

A prior collection of rural health priority literature reviews, known as *Rural Healthy People 2020*, did not reveal child and adolescent development as a top 20 priority.\(^\text{22}\) Therefore, this recent ranking as the 18th most important rural health priority represents a growing rural public health concern and a challenge for the next generation of public health professionals.

**PREVALENCE IN RURAL AREAS**

Children and adolescents in the U.S. represent an important, and increasingly diverse, population with significant variance across social determinants of health (SDOH) status,
especially in relation to their race/ethnicity, socioeconomic status, and geography. About 13.4 million children and adolescents under 18 years old (22.1%) live in rural America. Living in rural areas impacts young people’s health outlook and transitions from childhood to adolescence to young adulthood. Young people living in rural communities are at risk for, and have a greater prevalence of, adverse childhood experiences (ACEs). Rural children and adolescents may be more likely to witness violence or have a family member attempt or die by suicide. They are also more likely to grow up in a household with substance misuse, mental health conditions, or instability problems. These ACEs are linked to children and adolescents developing chronic health problems, mental illness, and substance use by the time they transition to adulthood.

Children and adolescents in rural areas experience worse health outcomes than their urban counterparts. They are more likely to be overweight or obese. The percentage of children with diagnosed mental, behavioral, and developmental disorders (MBDD) is consistently higher in rural areas, with 18.6% of children reporting an MBDD compared to 15.2% of urban children. Beginning in early childhood, MBDDs such as anxiety, attention-deficit/hyperactivity disorder (ADHD), and language problems, can affect lifelong health and well-being. Adolescents in rural areas are more likely to misuse opioids and have higher suicide rates compared to urban youth. In addition, adolescents in rural areas are four times more likely to be the victim of a violent crime, including rape, sexual assault, robbery, and aggravated or simple assault.

CHILD AND ADOLESCENT DEVELOPMENT BARRIERS AND GAPS

Significant barriers exist related to child and adolescent development in rural areas. Gaps in educational and healthcare opportunities influence their access to, experience with, and timeliness of services. Barriers to quality educational services create a literacy gap between rural and urban youth. Rural situations impact youth access to screening, which delays the onset and timeliness of services needed during childhood. For example, a screening gap exists for behavioral health, vision, and hearing, keeping low socioeconomic families with financial constraints further separated from screening services. Lack of screening and access to care constrain children and adolescents from receiving mental health treatment, compared to metropolitan and urban areas.

The geographic and cultural context in which rural children and adolescents reside cannot be unlinked from the barriers and gaps they experience related to their development. One neighborhood factor is that rural communities tend to be comprised of families with housing that are long distances from school buildings, resulting in higher transportation costs for the schools and longer commute times for the students. Similarly, rural communities experience healthcare gaps due to a lack of rural primary care providers, behavioral health providers, health clinics, and community services. For children and adolescents, this may result in missing more days of school because of illness or the inability to access healthcare services.

RURAL DISPARITIES INFLUENCING CHILD AND ADOLESCENT DEVELOPMENT

Structural constraints, discrimination, and victimization are factors present in rural communities that influence family dynamics and thus, rural child and adolescent development. Black, Latinx, and LGBTQ populations in rural areas are at even greater risk for experiencing both discrimination and the aforementioned factors that impact rural young people and how they learn, grow, and develop. Further, the ability of young people to adapt to racial and ethnic socialization or cultural isolation may influence how children and adolescents are communicated and interacted with, influencing their belongingness and skills to deal with the realities of racism and discrimination. Given that one in four (25%) rural students are not White, disparities for young people based on race and ethnicity are relevant to their growth and development.

Poverty in rural communities stems from limited access to education and healthcare, quality community and public infrastructure, employment, social class segregation as well
as the commercial market. Many factors contribute to the cycle of poverty experienced within rural communities, ranging from educational attainment and labor/workforce participation. Constrained work opportunities and unemployment impacts children and adolescents from a family, household, and socio-economic perspective. Levels of unemployment and lack of job growth are tied to educational attainment represented by lack of diploma and high school completion.

Populations living in rural communities are more likely to experience contact with the legal system, time in jail, experience suicidality, use drugs illegally, and experience early parenthood among other outcomes that impact families and the children and adolescents around them. These illegal or problematic behaviors decrease children and adolescents’ protective factors and the opportunities to form healthy relationships with adults in rural communities. As a result, rural health initiatives stand to benefit from focusing on programs that aim to mitigate these factors in the lives of rural children and adolescents.

**INTERSECTION OF CHILD AND ADOLESCENT DEVELOPMENT, SOCIAL DETERMINANTS, AND RURAL HEALTH**

**Education**

The setting most accessed by rural children and adolescents is schools. Schools play a significant role in supporting healthy development and promoting the safety of students. Policies provide a foundation to expect and promote a healthy and safe school environment, and to ensure student access to developmental programs and services in the school setting. Intentional policies support school stakeholders and student development to notably improve literacy, health behaviors, and educational attainment. Teachers and school stakeholders impact rural young people’s access to education and quality of programs by providing a variety of resources, opportunities and interventions that improve math skills, literacy, behavioral health, and physical health. For example, reading and math programs for children and adolescents impact literacy skills and increase graduation rates.

From a rural health perspective, School Health Advisory Councils (SHAC), which include a variety of members, work to promote a healthy and safe school environment that also supports child and adolescent development. The SHAC members represent the community and provide insight into relevant policies and practices that influence school health and child and adolescent development. This council often has input from students, parents, teachers, and school administrators to identify barriers and solutions to improving the health and well-being of students. This provides local community input on education and health interventions determined to fit community needs and address the development of lifelong skills among children and adolescents.

Ideally, to address the health and development of young people, rural schools should also provide nutritious meals, encourage physical activity, contribute to healthy social-emotional development, and strive to maintain a safe physical environment where students can learn. These initiatives facilitate an environment for students to become better learners, achieve academically, and maintain lifelong health benefits. Despite efforts at both state and federal levels to address nutritional needs through the federal school lunch program, overweight and obesity rates for rural youth continue to remain significantly higher than their urban counterparts. Support for school programs and interventions to promote positive health behaviors and lessen negative health behaviors assists in reducing impacts caused by food deserts and overeating.

Health education in both elementary and secondary schools can improve health and well-being and lead to the development of essential life skills. By offering formal, structured health education lessons and courses from early childhood through secondary, young people are engaged in multiple opportunities to impact their learning and health. Health education reinforces health messages relevant for young people, but also should be tailored to meet the needs of rural students, especially as they age and developmentally progress through secondary school. At least two health education courses and planned learning experiences during 6th-12th grade provide the opportunity for young...
people to develop and build the skills they need to make healthy decisions, achieve literacy, adopt healthy behaviors, and promote health within their community. By the time students reach high school, adolescents should engage in skill-building educational activities that help them develop life and transferable skills (e.g., communication, decision making).

Rural schools also impact the health of their students when they serve as a location for providing students with healthcare. Access to healthcare is a significant barrier for rural families and School Based Health Clinics (SBHCs) ensure access to first aid, emergency care, assessment, and the management of chronic conditions. When the provision of care at an SBHC does not meet child or adolescent needs, services are then designed to ensure referrals to other medical homes. Having an SBHC in rural and low-resourced communities increases the ability of young people and their families to address health and chronic conditions and respond to social stressors like the economic or geographic barriers.

Schools can also serve as a location for providing students with counseling and behavioral health services and are the most common location for children to receive mental health services. The prevention and intervention services provided through school-based counseling, psychological, and social services support the mental, behavioral, and social-emotional development of children and adolescents and promote their success in the learning process. Services supporting both child and adolescent development include health screening and assessments, interventions, and referrals to school and community support services. School-employed professionals ensure that young people can receive early and timely screenings and treatment, which will reinforce development and learning for young people.

**Neighborhood Support, Social and Community Engagement**

A healthy and safe community or neighborhood environment promotes a healthier child and adolescent development. Although the census defines a community by population count, others will describe the rural community not only by population, but also by housing density and the community’s sense of identity and values. The environment of a community and its members influences development and allows parents and families time and opportunity to focus on developmental factors for their children like education, parental employment, and family health. The rural community provides context for inequities attributed to their economic, historical, and social environments.

Unique barriers attributable to residing in certain underserved rural communities may lead to a variety of disparities. For example, community members’ access to mental health providers and the way people are treated based on racial or sexual orientation discrimination creates challenges for rural children and adolescents. Parents of children with mental, behavioral, and developmental disorders in rural communities more often experience financial difficulties, report monetary consequences, and rate their own mental health or their partner’s mental health as “fair” or “poor.” Rural communities also experience infrastructure and transportation challenges including public areas with poor conditions and transportation challenges. Rural young people often live in a neighborhood without amenities that are more common in urban areas such as community parks, recreation centers, and libraries. Transportation, and distance to travel influences parents’ ability to drive their dependent children to and attend healthcare appointments. These challenges make it harder for families to provide their children with opportunities to gain experience, grow, learn, and thrive.

The effect of social and economic positions within rural cultures and communities influences young people from childhood to adolescence and adolescence to young adulthood. The unique combinations of social status and living as a family or in a community that experiences the cycle of poverty can increase risk factors for young people. Children and adolescents living in poverty are more likely to be at risk for certain behaviors that are already more prevalent in rural communities (e.g., heavy drinking, drug use, marijuana use, cigarette smoking, opioid use). Rural children and adolescents living...
in poverty are more likely to experience and confront difficulties in school and develop into adults that experience poor health problems and live in impoverished neighborhoods.

Children and adolescents’ environment, especially their home environment, can undermine their health and safety and cause threats that urban youth may not face, such as lack of police or fire protection. Rural children and adolescents are often at risk for conditions that challenge their sense of safety, stability, and bonding; therefore, placing them at risk and greater prevalence for ACEs. Rural children and adolescents may be more likely to witness violence, have incarcerated parents/guardians, or have a family member attempt or die by suicide. Rural communities may be comprised of households with substance misuse, mental health, or instability problems. Their ACEs are linked to children and adolescents developing chronic health problems, mental illness, and substance use by the time they transition to adulthood.

**Health and Health Care**

Rural children and adolescents are more likely to experience a healthcare access challenge in finding and accessing appropriate healthcare providers, behavioral health resources, and community services. These services are scarce in rural communities because of a shortage of providers, financial constraints, lack of internet access, and transportation challenges. These gaps can lead to lack of a medical home and less usage of primary care, clinical, and prevention services.

Moreover, mental and behavioral health services, including developmental screening programs, are notably limited in rural areas. Mental and behavioral health often begin in early childhood and peak at adolescence and into young adulthood, yet the challenges can affect lifelong health and wellness. Finally, in addition to children and adolescents with mental, behavioral, and developmental disorders benefiting from better access to mental and behavioral healthcare, programs that support parents and caregivers would improve the rural healthcare gap.

Collaboration among healthcare systems, primary care clinicians, early childhood learning programs, and family/caregiver support programs may offset the challenges faced by children and adolescents in rural areas. Given the shortage of providers, integrated care between behavioral health and primary care can break down barriers. Opportunities for telehealth and telemedicine, or virtual healthcare clinics, are on the rise. Communities with broadband may offer virtual care as a potential solution for families establishing medical homes, thereby decreasing the travel back and forth on rural roads to clinic visits. Additionally, through collaborative care, healthcare providers can track children’s physical, mental, emotional, and behavioral development through screenings and preventive care services.

**PRACTICE CONSIDERATIONS FOR RURAL CHILD AND ADOLESCENT DEVELOPMENT**

Child and adolescent development affect a person’s lifelong health and well-being. When the behaviors and factors that affect health and well-being later in life are ignored, children and adolescents’ risk of not being safe or healthy increases. Unaddressed, young people become at risk for preventable health problems including substance use disorders, unplanned pregnancy, and violence. Rural health initiatives should decrease access gaps for children and adolescents to ensure they grow up in a safe and nurturing environment; have opportunities to experience their full education potential; and can access health screening, services, and treatment necessary to reach their full potential.

Children and adolescents who experience ACEs may have a range of negative impacts. Most ACE interventions will focus on therapy and support interventions that mitigate harm and address social pathways. Additional mediation that can support rural young people is for schools, community organizations, and providers to utilize trauma-informed approaches. Although there is a lack of appropriate resources and research tailored to trauma-informed approaches and social-emotional learning for rural communities, rural community leaders and stakeholders can assist children and adolescents in developing skills in resiliency in order to meet challenges and stressors and to mitigate issues impacted by ACEs.
Community engagement and enrichment opportunities offer protective conditions for rural children and adolescents to engage in their neighborhoods. Partnering with community stakeholders can support social connections and overall neighborhood experiences that support children and adolescents in their development. Community-level interventions normally incorporate families into the program and can help develop young people and keep them safe and healthy.

PROVEN SOLUTIONS AND INTERVENTIONS

Federal, state and local investments in child and adolescent development bring significant and long-lasting benefits for rural young people, families and communities. Although programs addressing health disparities that are tailored for rural populations are scarce, communities can engage and invest in programs and interventions to keep their children and adolescents safe and healthy.

School Based Health Centers

School Based Health Centers are a proven solution to rural child and adolescent development disparities that impact educational and health outcomes. Rural communities are recommended to start and maintain SBHCs to provide health services to students in pre-K through grade 12, but can also serve others including school staff, family members, and community members. To operate, SBHCs develop policies and practices that promote health and safety, reduce gaps in education, and improve health equity. These SBHCs must provide school-based (on-site) or school-linked (off-site) primary health care and make community-informed decisions about when services are available. Single clinicians can provide primary care or healthcare teams can collaborate to provide more complex services such as developmental screening, mental health care, social services, dentistry, and health education.

Whole School, Whole Child, Whole Community Model

The Whole School, Whole Child, Whole Community (WSCC) model is a framework for addressing health in schools that can meet the unique needs of rural communities. The model focuses on the child or adolescent student and emphasizes the need for collaboration between schools, communities, and healthcare stakeholders to align resources, which are hard to access in rural settings, that support the whole child. Focused on multiple components, schools and rural communities can emphasize different services which meet their needs. Services may include: integrating school health services; identifying how to integrate nutritious meals; encouraging physical activity; and focusing on healthy social-emotional development through counseling, psychological, and social services. The WSCC strives to maintain a safe, youth-friendly physical environment with community input to address rural needs.

Screening for Anxiety, Depression and Suicide

The U.S. Preventive Services Task Force (USPSTF) recommends screening for anxiety in children and adolescents ages eight to 18 years, and for major depressive disorder (MDD) in adolescents ages 12 to 18 years, even for those who are not showing recognized signs or symptoms of anxiety and depression. Anxiety disorders in childhood and adolescents are associated with an increased likelihood of a future anxiety disorder or even depression - a leading cause of disability in the U.S. Children and adolescents with depression often have functional impairments in their performance at school or work, as well as in their interactions with families and peers. Depression can negatively impact development in affected youth. Screening, as part of child and adolescent health services, allows the opportunity for providers to detect issues early and help rural youth seek treatment that may prove scarce in their communities.

SUMMARY AND CONCLUSION

It is noteworthy that the national Rural Healthy People 2030 survey respondents evaluated the inclusion of “Child and Adolescent Development” as an important and focused health area, highlighting the attention given to this population. This review demonstrates the need to consider rural children and adolescents as a priority population with a need for tailored, prioritized educational opportunities, community-focused programming, and health services. Children and adolescents have always
been a part of the rural landscape; however, they have greater health and developmental risks and experience social and health risks at higher levels compared to their urban counterparts. We underscore the importance of education and literacy development, and access to healthcare and mental health screening and treatment, as areas for focused attention to influence the health and development of rural young people.

Efforts to monitor the health and development and other interrelated trends among the child and adolescent population over time will improve health outcomes for both urban and rural children and adolescents. Monitoring the implementation and reach of evidence-based programs delivered in rural areas will help us better understand whether these resources are meaningful to, and utilized by, rural children and adolescents. Further, there is a great need to understand the array of implications for young people with multiple risk factors in rural areas, especially as this population grows into the young adult and adult age group.

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**Related Chapters:**
- Chapter 4. Obesity and Physical Activity in Rural Settings
- Chapter 8. Preventive Care for Rural Populations and Providers: Routine Screenings, Prenatal Care, and Oral Health
- Chapter 16. Rural Education Access and Quality

**Suggested Chapter Citation:**
HOSPITAL AND EMERGENCY SERVICES IN RURAL AREAS

By Murray J. Côté, PhD, and Aakriti Shrestha, MPH

SCOPE OF THE PROBLEM

- A recent survey of rural stakeholders identified “Hospital and Emergency Services” as the 19th leading rural health priority for 2030.

- While the Healthy People 2020 goal for “reducing the proportion of people who can’t get medical care when they need it” has not been met, it has improved to 7% in 2021 since the 2019 baseline of 8.5%.

- Between 2015 and 2019, 59% of U.S. community hospitals that closed were rural hospitals.

- Visits to rural emergency departments increased more than 50% between 2005 and 2016.

- The Healthy People 2020 goal to reduce hospital-based infections (i.e., Clostridioides difficile) has been met.

- Innovations in rural health services delivery could include aligning medical screening examinations with affiliated rural health clinics, designating rural emergency hospitals, and expanding telehealth.

The Healthy People 2030 overarching goal for Hospital and Emergency Services is to “prevent hospital visits and improve emergency department and hospital care.” This chapter addresses four critical elements of hospital and emergency services, in a rural context, with contrasts made to nonrural (i.e., urban) hospital and emergency services as appropriate. We will first discuss accessible and preventable hospital and emergency department visits with a focus on the impact of rural hospital closures. Second, emergency department quality of care will be addressed, with a particular emphasis on emergency department wait times. The third focus area is rural inpatient hospital care, which includes efforts to reduce hospital-acquired infectious diseases as well as increase the role of health information technology. Lastly, follow-up services, particularly referrals for substance use treatment, will be examined.

A national survey of rural stakeholders found that the Healthy People 2030 category of Hospital and Emergency Services ranked as the 19th most important rural health priority. Respondents from the four U.S. census regions ranked the topic similarly – from 16th in the South to 20th in the West. Likewise, respondents ranked the topic similarly, regardless of whether their state had or had not adopted Medicaid expansion. Not surprisingly, rural health stakeholders aged 65 years and older ranked hospital and emergency services as their 7th leading rural health concern, compared to 35 to 64 year-olds (19th) and 18 to 34 year-olds (21st). Of note, in Rural Healthy People 2020, Hospital and Emergency Services was not offered as an individual category to be ranked, but was combined within the Healthcare Access and Quality category which then ranked as the number one priority for rural respondents.

Specific to Healthy People 2030, the material in this chapter is relevant to the following goals important to hospital and emergency services:

- AHS-04 Reduce the proportion of people who can’t get medical care when they need it
- AHS-09 Reduce the proportion of emergency department visits with a longer wait time than recommended
- HAI-01 Reduce C.diff infections that people get in the hospital
- HAI-02 Reduce MRSA bloodstream infections that people get in the hospital\textsuperscript{10}
- HC/HIT-D06 Increase the proportion of hospitals with access to necessary electronic information\textsuperscript{11}
- SU-D02 Increase the proportion of people who get a referral for substance use treatment after an emergency department visit\textsuperscript{12}

**PART 1. PREVENTABLE AND ACCESSIBLE HOSPITAL AND EMERGENCY SERVICES**

**AHS-04 Reduce the proportion of people who can’t get medical care when they need it**\textsuperscript{2}

To place this chapter in context, it is important to describe the relationship between emergency services and hospital services. The American College of Emergency Physicians defines emergency services as “any health care service provided to evaluate and/or treat any medical condition such that a prudent layperson possessing an average knowledge of medicine and health, believes that immediate unscheduled medical care is required.” These emergency services are often provided in emergency departments within hospitals across the country. According to the Center for Disease Control’s (CDC) National Center for Health Statistics, there were an estimated 145 million emergency department visits in 2016. Following 2016, there was a decrease until 2019 when emergency department visits reached an estimated 151 million annual visits, with a decrease in 2020 (likely due to the COVID-19 pandemic) and subsequent rise in visits to an estimated 140 million in 2021.\textsuperscript{11} With this volume of annual visits, it is crucial that people who need care can access emergency services easily and with limited wait times as emergency department visits can also result in hospital admissions.

Many emergency department visits are preventable. Data from HCUP identified the leading cause of emergency department visits in 2018 (prior to COVID-19) as injuries and poisonings, with twice as many of those patients being treated and released as were admitted to the hospital.\textsuperscript{15} The most common diagnoses recorded for 2018 emergency department visits resulting in hospital admission were reported to be ailments related to the circulatory, digestive, and respiratory systems (18.0%, 13.3%, and 11.9%, respectively).\textsuperscript{15}

While prevention is a purposeful goal, concrete action is needed to reduce both the misuse (i.e., inappropriate use of the emergency department) and overuse (i.e., habitual use of the emergency department as the principal source of care) of emergency hospital services. It has been reported that vulnerable populations – as defined by socioeconomic characteristics – make more preventable visits to emergency rooms than others.\textsuperscript{16} The social determinants of health that may influence frequency of preventable emergency department visits include lower income, lesser educational attainment, unemployment, lack of health insurance, and lack of access to transportation and/or internet service.\textsuperscript{16} As suggested in Healthy People 2030, strategies to prevent unnecessary emergency department visits may need to include connecting people to a primary care provider and promoting healthy lifestyles and behaviors.\textsuperscript{6} This is particularly applicable for vulnerable populations.

Concerningly, access to emergency services in rural areas is limited compared to urban areas, and has worsened as the rate of rural hospital closures has increased.\textsuperscript{17} This is adding undue pressure on remaining rural and nearby hospitals, and their communities, with rural residents driving further to access important health services than their urban counterparts.\textsuperscript{18} While the future of rural-based hospital and emergency services remains challenging, there are opportunities to mitigate and even improve access to these services.

The Office of the Inspector General of the U.S. Department of Health and Human Services (DHHS) defines a hospital closure as, “a facility that stopped providing general, short term, acute inpatient care.”\textsuperscript{17} This definition can be further refined into converted closures (i.e., closure of the hospital’s inpatient care unit only) or complete closures (i.e., the hospital no longer provides any services whatsoever).\textsuperscript{19} Both instances negatively impact access to health services in affected communities.

Currently, approximately 46 million people nationwide (i.e., 14% of the U.S. population) live in rural areas that have a significant shortage
Since 2010, there have been more than 77 complete rural hospital closures. Reasons for these closures include declining patient volumes, low reimbursement, staffing shortages, and regulatory barriers. According to researchers at the Cecil G. Sheps Center for Health Services these closures have been increasing since the 2008-2009 recession. There are likely multiple contributing factors including: failure to recover from the recession; population demographic trends; market trends (e.g., increased rates of mergers and/or affiliations); decreased demand for inpatient services; and new models of care, such as accountable care organizations. Long-standing trends, such as generally poorer financial performance in the South, may contribute to closure rates. Along with these trends being seen as possible contributing factors to hospital closures, researchers have also suggested the possible effect of the Affordable Care Act (i.e., Obamacare) and its correlation with a state’s decision on whether or not to expand Medicaid.

These closures increase the burden on both remaining hospitals and those patients who are seeking care. As noted earlier, rural health settings are chronically understaffed which negatively impacts wait times and treatment of patients. Rural patients also have significant travel barriers. The typical rural resident travels an average of 17.8 miles to access medical care, as compared to urban residents who travel 8.1 miles on average.

The proportion of people who cannot get medical care when they need it has gradually improved from the 2019 baseline of 8.5% to 7% in 2021, but remains above the Healthy People 2030 target of 5.9%. According to the Healthy People 2030 website, the most recent data (2021) shows that the proportion of people who can’t get medical care due to cost is 6.7% for metropolitan populations, compared to 8.7% for nonmetropolitan (i.e., rural) populations. Research shows that there are several reasons for the limited access to emergency medical services, especially in rural areas. These include rural hospitals reducing or eliminating services, and/or closing the hospital entirely, both of which increase travel distance to emergency care.

PART 2. QUALITY OF CARE FOR EMERGENCY DEPARTMENTS AND HOSPITALS

AHS-09 Reduce the proportion of emergency department visits with a longer wait time than recommended

Lengthy emergency department wait times indicate overcrowding as the demand for services (i.e., arrivals to an emergency department) exceeds the capability of the facility to provide services (e.g., number and type of medical providers, number of beds). According to the CDC, the wait time for an emergency department visit varies by the volume of annual emergency department visits.

Wait times, however, are not the sole determinant of emergency department quality of care. Emergency departments may reach capacity and quality of care may suffer as patients experience boarding (i.e., holding patients in the emergency department because an inpatient bed is unavailable) or diversion of their ambulance from one hospital to another. The Agency for Healthcare Research and Quality (AHRQ) has reported that, “nearly half of emergency departments report operating at or above capacity, and nine out of 10 hospitals report holding or boarding admitted patients in the emergency department while they await inpatient beds.” Furthermore, this overcrowding is such an issue that it is estimated that half a million ambulances are diverted each year from the closest hospital to find one that has available space.

Because of wide variability among hospitals and their associated wait times for care in the emergency department, the concept of average wait time must be qualified. Smalley et al. (2021), suggests there are other factors that should be considered including the quality of care provided, the behavior of patients in the emergency department (i.e., do they wait for care or leave before being seen), and the breadth of services available at the emergency department and its hospital, including access to emergency services such as ambulances. Related, where wait time has been measured, shorter wait times can be attributed to population density (i.e., lower population density implies fewer people visit...
the emergency department), and the availability of alternative care venues such as urgent care facilities and primary care doctors.\textsuperscript{35} Another unfortunate reason some states have shorter emergency department wait times is associated with higher rates of uninsured residents.\textsuperscript{36}

While a hospital cannot deny patients life-saving treatment if they do not have health insurance, some patients may avoid going to the hospital until absolutely necessary to avoid costly bills.\textsuperscript{2}

\section*{PART 3. INPATIENT HOSPITAL CARE}

**HAI-01 Reduce C.\textit{diff} infections that people get in the hospital**

**HAI-02 Reduce MRSA bloodstream infections that people get in the hospital**

\textit{Clostridioides difficile} (\textit{C.\textit{diff}}) is a bacteria that causes severe, often life-threatening diarrhea.\textsuperscript{37} Susceptibility to \textit{C.\textit{diff}} is usually a side-effect of taking antibiotics. In 2017, there were roughly 223,900 cases of \textit{C.\textit{diff}} among hospitalized patients and, subsequently, 12,800 deaths in the U.S.\textsuperscript{38} Despite the prevalence of \textit{C.\textit{diff}} cases in 2017, rates of \textit{C.\textit{diff}} have actually decreased beginning in 2015.\textsuperscript{38} When looking at 2016 \textit{C.\textit{diff}} cases by rurality, it was reported that rural hospitals had a lower prevalence of \textit{C.\textit{diff}} per 1,000 hospital discharges than urban hospitals.\textsuperscript{39} Rural hospitals experienced a smaller decrease in \textit{C.\textit{diff}} prevalence (adjusted prevalence difference \textasciitilde -0.3) from 2016 to 2018, compared to both urban teaching and nonteaching hospitals (aPDs of -1.8 and -1.9, respectively).\textsuperscript{39} It should be noted that the Healthy People 2030 goal for reducing \textit{C.\textit{diff}} has already been met in 2023.\textsuperscript{5}

Along with the prevalence of \textit{C.\textit{diff}}, methicillin-resistant \textit{Staphylococcus aureus} (MRSA) is another infection-related issue impacting hospitals in the U.S. The MRSA bacteria is resistant to multiple types of antibiotics and is spread by contact with infected people or things carrying the bacteria.\textsuperscript{40,41} In the U.S., approximately 5\% of patients in hospitals carry MRSA in their nose or on their skin.\textsuperscript{41} However, the CDC reports a decrease in the estimated number of MRSA cases in hospitalized patients, from 401,000 cases in 2012 to 323,700 in 2017.\textsuperscript{38}

Various efforts have been adopted with the goal of reducing both \textit{C.\textit{diff}} and MRSA in hospitals. Proper hand hygiene, antimicrobial stewardship, and environmental decontamination have proven successful in reducing \textit{C.\textit{diff}}.\textsuperscript{42} In addition to these efforts to reduce \textit{C.\textit{diff}}, efforts have been implemented to reduce MRSA rates that go beyond the recommended hand washing, covering of wounds, and not sharing personal items.\textsuperscript{43} With Universal ICU Decolonization, the primary protocol designed to reduce MRSA in the intensive care unit, patients are not tested for MRSA when they enter the unit, rather all patients are bathed daily with a 2\% chlorhexidine cloth and receive mupirocin ointment twice a day for five days.\textsuperscript{43} With the universal ICU decolonization approach, MRSA-positive clinical cultures have been reduced by 37\% and all-cause bloodstream infection has been reduced by 44\%.\textsuperscript{43}

Despite the efforts in place to address \textit{C.\textit{diff}}, rural hospitals have reported barriers to adopting some prevention practices. For example, a survey of rural facilities in Wisconsin reported common barriers to implementing prevention practices included “insufficient resources to adequately implement recommended practices, lack of physician champion, and difficulty keeping up with new recommendations.”\textsuperscript{44} In addition to the barriers in addressing \textit{C.\textit{diff}}, rural hospitals also face barriers in addressing MRSA. In Iowa, rural hospitals reported lack of support from physicians as one of the most common reasons for not having an active surveillance for MRSA.\textsuperscript{45} Addressing these barriers is essential to ensure that rural hospitals will be able to implement effective efforts to continue reducing both \textit{C.\textit{diff}} and MRSA.

**HC/HIT-D06 Increase the proportion of hospitals with access to necessary electronic information**

The limited availability and accessibility of health information technology poses a challenge for rural hospitals and emergency services. Meaningful use is of particular concern among rural hospitals. Meaningful use can be defined as meeting the staged requirements for providers to demonstrate progressively more integrated use of electronic health records (EHRs) in order to receive incentive payments from the Center for Medicare and Medicaid Services (CMS) under the HITECH Act.\textsuperscript{46} It has been reported that small rural hospitals were 13\% more likely to skip at
least one year of meaningful use, while critical access hospitals (CAHs, <25 acute care inpatient beds) were 16.4% more likely to skip.\textsuperscript{17} Electronic health records uptake varies among rural and urban hospitals. Rural hospitals on average added three EHR functions between 2016 and 2019, compared to urban hospitals which reached almost full functionality by 2019.\textsuperscript{18}

Beginning in 2018, CMS renamed the EHR Incentive Programs to the Medicare and Medicaid Promoting Interoperability Programs (PIPs).\textsuperscript{19} The new name reflects a change in the program’s emphasis away from meaningful use of EHR requirements to a focus on interoperability and improving patient access to health information.\textsuperscript{19} Beginning in 2022, the program was renamed Medicare PIP after the Medicaid portion of the program ended.

Despite the benefits associated with health technology and EHR services, there are rural disparities present that stem from a variety of factors. According to the Government Accountability Office, rural providers are less likely to have the financial and technological resources to take part or even maintain electronic exchange capabilities.\textsuperscript{20} Furthermore, these programs require a significant investment to purchase, upgrade, and maintain equipment and software.\textsuperscript{22} In addition to financial barriers, rural hospitals may not have the available technological infrastructure, like broadband support to achieve meaningful use.\textsuperscript{22} It is also worth noting that within rural America, there is a lack of individuals working in the health information technology field, thus resulting in additional barriers to achieving adoption of health technology and associated EHR services.\textsuperscript{24}

It is crucial that efforts are in place within rural hospitals to address barriers in adopting and utilizing health information technology. Incorporating this technology has various benefits that would aid in addressing the challenges rural hospitals face. For example, health information technology is beneficial in reducing the barrier of long distances between medical providers by decreasing travel time and assisting rural hospitals in accessing remote clinicians.\textsuperscript{22} It can be inferred that travel time decreases as patients’ records become more accessible through technology. Likewise, health information technology can also aid in improving disease surveillance, compiling health data, and improving care coordination.\textsuperscript{22}

### PART 4. FOLLOW-UP SERVICES

**SUD-02 Increase the proportion of people who get a referral for substance use treatment following emergency department visit**

The issue of substance use is a serious problem in the U.S and is a growing issue for rural Americans. From 1999 to 2019, drug overdose deaths in rural counties increased from four to 19.6 per 100,000 persons.\textsuperscript{53} In 2020, the rate of drug overdose deaths was found to be 26.2 deaths per 100,000 population in rural counties.\textsuperscript{54}

Along with the growing mortality rate, there has been an escalation in emergency department visits related to opioid misuse. From 2010 to 2017 in rural areas, emergency department visits related to opioid misuse increased from 95.8 to 99.2 per 100,000 population.\textsuperscript{55} With the prevalence of substance use and overdose-associated deaths, efforts are needed to provide referrals for treatment following emergency department visits. However, to provide referrals, there are several barriers that must first be addressed, and these barriers can be specific to the parties intended to affect substance use. First, from the provider’s perspective, the primary barriers to the referral process noted in a 2018 study were: determining patient eligibility, lack of transparent treatment capacity, knowledge or understanding of options, and communication challenges between the referral source and the substance use treatment facility.\textsuperscript{58} Second, from the hospital perspective, among those hospitals that implemented emergency department-based peer services in response to the opioid epidemic their barriers included: integrating peer intervention in the emergency department culture and context, insufficient staffing to meet patient needs, logistical and legal barriers regarding patient privacy, and limited patient transportation options.\textsuperscript{56} Lastly, individuals may not communicate their substance misuse to providers because of a fear of legal penalties as well as a lack of anonymity in small communities.\textsuperscript{57} There remains considerable stigma for patients as a barrier to the referral process for substance...
use disorder (SUD) treatment. Compounding the barriers to the SUD referral process, is the shortage of rural healthcare providers and mental healthcare services.

One way to potentially increase substance use treatment referrals is through the implementation of new information technologies. It has been found that leveraging health information technology as recommended by DHHS may address across-organization barriers to treatment. An electronic platform will ultimately aid in the referral and placement of patients who are in need of treatment in a more efficient manner, and the sooner one enters treatment the likelihood of completing treatment increases. Along with improving integration, telehealth may be seen as an effective tool in substance use treatment and addressing the issue of shortages of providers. Partnering with an external telehealth hub that is continuously available is becoming more common in treatment for substance use disorder.

**POTENTIAL SOLUTIONS**

Given how challenging it is to provide healthcare in rural hospital and emergency settings, innovations in health services delivery are needed to overcome rural-based difficulties with access to emergency care, quality of care, and resource availability. Three promising approaches are: aligning medical screening examinations (MSEs) with rural health clinics (RHCs); the introduction of rural emergency hospitals (REHs) as a new provider designation established by the Consolidated Appropriations Act, 2021; and expanding the use of telehealth.

Medical screening examinations are intended to appropriately identify emergency department arrivals who can be treated in a non-emergent setting versus those arrivals who are truly emergent. These MSEs must be consistent with the Emergency Medical Treatment and Labor Act (EMTALA). Aligning the emergency department’s MSE to an on-site or affiliated outpatient clinic could improve appropriate access to care. In rural settings, there may be cultural or behavioral shifts to overcome as residents may be accustomed to always seeking care at their local hospital-based emergency department, regardless of the level of care needed. A recent successful application of this initiative was reported for a large regional health system that serves rural communities in the state of Texas.

The Consolidated Appropriations Act of 2021 began accepting applications in 2023 for REHs, a new type of health care provider. The REH designation is available to CAHs and rural acute care hospitals with 50 or fewer beds that agree to eliminate acute care inpatient services. The purpose of the new designation is to provide opportunities for these hospitals to remain open and provide essential services, including emergency, observation, and outpatient services.

In a 2019 study of emergency departments in a group of CAHs, telehealth behavioral health patients experienced a 12-minute average wait time compared to an average of 27 minutes for patients seeing a local provider. The adoption of telehealth is growing throughout the U.S. and became particularly important during the COVID-19 pandemic. Additionally, telemedicine has led to an overall decrease in mortality, inpatient length of stay, and improved patient and provider satisfaction. With the growing benefits of telehealth and telemedicine in rural communities, efforts are needed to expand broadband access along with continued financing for telehealth in these communities.

Limited access to broadband poses a barrier to many rural Americans. Programs like Universal Service Fund, Connect America Fund, and telecommunication grants provide financial support to obtain broadband access. Following the ending of the COVID-19 public health emergency designation, Medicare has continued to pay telehealth services, but starting January 1, 2024, Medicare will go back to the pre-emergency designation. Continuing funding for telehealth services and improving access to broadband internet will allow rural communities to have continued access to telehealth services. Of note, telehealth is discussed in greater detail in Chapter 3 on Rural Healthcare Access and Quality.

**SUMMARY AND CONCLUSION**

Rural America continues to face significant challenges in accessing hospital and emergency services. Through various combinations of policy and technology, considerable progress has been
made in the breadth and delivery of services in rural communities. Ironically, the barriers that persist are consequences of being associated with rural regions. The pursuit of improving rural-based hospital and emergency services is made more difficult by limited healthcare resources, low population density, and residents with limited or no health insurance who also tend to have generally poorer health status relative to those in other, primarily urban, geographic areas. Optimistically, the growing and persistent attention being paid to rural America may ultimately lead to lower disparities and fewer challenges. The recognition of the rural-urban gaps coupled with innovations in delivery, such as REHs and telehealth, represent important and significant progress.

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**Related Chapters:**
Chapter 3. Rural Healthcare Access and Quality
Chapter 15. An Examination of the Workforce in Rural America
Chapter 17. Health Insurance for Rural Americans

**Suggested Chapter Citation:**
THE ISSUE OF CHRONIC PAIN IN RURAL AMERICA

By Brandon Williamson, MD, FAAFP, and Gracie Woodland, BSPH

SCOPE OF THE PROBLEM

- Chronic pain is estimated to cost more than $550 billion dollars in direct medical costs and lost productivity annually.\(^1\,^2\)
- Rural areas have higher rates of both chronic pain and high-impact chronic pain compared to urban areas.\(^3\,^4\)
- Chronic pain carries with it a higher risk of mortality and numerous comorbidities, such as mood disorders, risk of addiction, and metabolic syndrome.\(^5\)
- Patients in rural areas are less likely to receive multi-modality intervention for chronic pain, which is the current standard of care.\(^6\)

Chronic pain is one of the most common medical conditions in the United States (U.S.) and one of the most common reasons patients seek medical care.\(^7\) In 2011, the Institute of Medicine (IOM) published a seminal statement discussing the importance of addressing chronic pain and its consequences. Pain was noted to be universal, affecting more than 100 million Americans, and costing greater than $560 million dollars annually in direct medical expenses and lost productivity.\(^1\) The IOM statement called for improved research related to pain, as well as a population-based strategy for its prevention and management.\(^1\) Chronic pain eclipses the individual annual costs of heart disease, diabetes, and cancer.\(^2\)

Chronic pain is defined as pain lasting longer than three months, the time beyond which normal tissue has healed from an initially painful event.\(^8\) Chronic pain is most commonly delineated as cancer and non-cancer related pain. Common types of non-cancer related pain include chronic low back pain, headache, and arthritis. Chronic pain can also be specified as high-impact chronic pain, which is pain that limits life or work activities on most days. The Healthy People 2030 objectives established for chronic pain target this type of limiting chronic pain.\(^9\)

Chronic pain is a pressing medical issue due not only to the direct and indirect medical costs, but also due to the personal suffering of individuals. Chronic pain may uniquely affect rural residents due to specific demographic risk factors related to geographic location (e.g., older residents, lower socioeconomic status)\(^10\) or reduced access to appropriate medical care (e.g., lack of transportation, increased travel distance, limited resources).\(^11,12\) In a recent web-based survey of rural stakeholders, 17.7% of the 1,291 respondents identified chronic pain as one of the “top 10” priorities for rural Americans.\(^13,14\) This ranked chronic pain as the 20th most important rural health priority. Related survey topics found in the top 20 rankings were mental health (1st), addiction (2nd), and drug and alcohol use (5th).

RELEVANT HEALTHY PEOPLE 2030 GOALS AND OBJECTIVES

Through its Healthy People initiatives, the U.S. Department of Health and Human Services identifies collective goals every 10 years to improve the health and well-being of Americans. Among its current priorities, Healthy People 2030 states that its overall goal for the health condition chronic pain is to “reduce chronic pain and misuse of prescription pain relievers.”\(^9\) The specific Healthy People 2030 objectives related to this chronic pain goal can be categorized into three areas: (1) reducing chronic pain and its impacts (i.e., high-impact chronic pain), including arthritis pain; (2) increasing chronic pain self-management; and (3) reducing the proportion of people who misuse (or start misusing) opioids.\(^9\)
This chapter will address chronic pain as it relates to rural Americans. Risk factors for chronic pain and arthritis are examined, and a robust historical perspective on chronic pain treatment in the U.S. concludes the chapter. (Of note, opioid use is covered more fully in Chapter 2 on addiction and Chapter 5 on drug and alcohol use.) The material provided may be relevant to the selected Healthy People 2030 objectives listed below.

- **CP-01:** Reduce the proportion of adults with chronic pain that frequently limits life or work activities
- **A-01:** Reduce the proportion of adults with arthritis who have moderate or severe joint pain
- **CP-D01:** Increase self-management of limiting chronic pain
- **SU-19:** Reduce the proportion of people who misused prescription opioids in the past year
- **SU-20:** Reduce the proportion of people who started misusing prescription opioids in the past year

### Arthritis

In rural America, arthritis is a condition that impacts approximately one in three adults.\(^{15}\) This condition is a leading cause of disability and a comorbidity to chronic pain.\(^{15,16}\) The rates of arthritis in rural areas follow previous trends showing a higher prevalence among women, older adults, smokers, adults with less education, adults who are less physically active, and adults with higher body mass indices (BMI).\(^{15}\) In rural communities, many of these risk factors are already higher than the national average.\(^{17}\)

Health-related behaviors of rural populations make them more susceptible to arthritis. The prevalence of individuals with higher than recommended BMI, and lower than recommended rates of physical activity is highest in rural areas.\(^{17,18}\) As mentioned previously, rural areas have a larger aging population than urban areas.\(^{19,20}\) Aging is a significant risk factor for arthritis as the bones, cartilage, and muscles in the body naturally wear down with time.\(^{21}\)

The occupations common to rural populations tend to be more physically demanding (e.g., farming and agriculture).\(^{22}\) The musculoskeletal system wears down drastically with manual labor.\(^{23}\) Arthritis is the result of this wear and tear and is one of the most prevalent conditions diagnosed to agriculture workers.\(^{24,25}\) One in three American farmers are affected by arthritis.\(^{26}\) Further, farmers often have a need to work well past retirement age. This is due to connections with their land and the notion that the longer they work, the longer they will be healthy.\(^{22}\) As the body naturally degrades, joint issues can happen more easily and more frequently in high intensity work environments.\(^{22}\)

Arthritis-attributable activity limitation, known as AAAL, impacts 55.3% of persons living in the most rural areas.\(^{15}\) This measure examines how arthritis impacts exercise, job performance, usual daily activities, or social activities. Not only does arthritis impact these activities, arthritis can lead to further health complications. Joint-related illnesses can decrease physical activity.\(^{27}\) Subsequently, a sedentary lifestyle due to joint issues may increase risk for cancer, heart disease, diabetes, and other serious conditions.\(^{28}\)

#### Table 1

Table 1 indicates responses to five arthritis-related questions, stratified by rural-urban residence,\(^{29}\) from the 2021 Behavioral Risk Factor Surveillance System (BRFSS).\(^{30}\) Of those BRFSS respondents living in rural areas, just over 38% reported that they have been told by a healthcare professional that they have one of five diseases – arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia (HAVARTH5) – compared to 32% of the respondents that lived in urban areas. Fewer of the rural respondents (63.25%), compared to urban respondents (67.41%), reported that a healthcare professional had suggested exercise to relieve their arthritis or joint symptoms (ARTHEXER). More urban dwellers (14.57%) reported that they had taken a class to learn about managing their arthritis than people living in rural areas (12.38%).

### Risk Factors for Chronic Pain in Specific Populations

Best viewed as its own clinical disease entity, as opposed to only a syndrome, chronic pain is a biopsychosocial disease with complex interplay between physical injury, psychological risk factors, substance use disorders, developmental
The Issue Of Chronic Pain In Rural America

Table 1. Rural-Urban Responses to Arthritis-related Questions from the 2021 BRFSS Survey

<table>
<thead>
<tr>
<th>Variable</th>
<th>% of Rural Respondents Who Said “Yes”</th>
<th>% of Urban Respondents Who Said “Yes”</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAVARTH5: Has a doctor, nurse or other health professional ever told you that you had some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?</td>
<td>38.04%</td>
<td>32.01%</td>
</tr>
<tr>
<td>ARTHEXER: Has a doctor or other health professional ever suggested physical activity or exercise to help your arthritis or joint symptoms?</td>
<td>63.25%</td>
<td>67.41%</td>
</tr>
<tr>
<td>ARTHEDU: Have you ever taken an educational course or class to teach you how to manage problems related to your arthritis or joint symptoms?</td>
<td>12.38%</td>
<td>14.57%</td>
</tr>
<tr>
<td>LMTJOIN3: Are you now limited in any way in any of your usual activities because of arthritis or joint symptoms?</td>
<td>42.61%</td>
<td>41.35%</td>
</tr>
<tr>
<td>ARTHDIS2: Do arthritis or joint symptoms now affect whether you work, the type of work you do or the amount of work you do?</td>
<td>30.51%</td>
<td>27.22%</td>
</tr>
</tbody>
</table>

Source: Original analyses of the 2021 BRFSS

experiences, and current life stressors. In terms of prevalence, population-based studies demonstrate that 11% to 40% of adults in the U.S. suffer from chronic pain,\(^4,7\) with the best estimate being 20.4% of adults, or approximately 50 million people. An estimated 8% of adults, or 19.6 million people, report high-impact chronic pain.\(^4,7\)

Chronic pain is more common in women than men (34.3% versus 26.7% according to one study)\(^31\) and seems to increase with age.\(^32-34\) In agreement with these findings, a 2020 study by Zelaya et al. demonstrated that chronic pain was highest among women, non-Hispanic White adults, and adults over age 65 years of age.\(^3\) The same study showed high-impact chronic pain was highest among women and geriatric patients.\(^3\)

Persons with lower household income have greater odds of reporting chronic pain compared to persons with higher reported income.\(^34\) In agreement, patients with financial concerns are significantly more likely to suffer from chronic pain.\(^35\) Related risk factors included: poverty, rurality, previously but not currently employed, and those with public health insurance.\(^4\)

Household wealth and socioeconomic status are inversely related to prevalence of high-impact chronic pain, regardless of race.\(^36\) People with a bachelor’s degree or higher education are less likely to report chronic pain.\(^4\)

Mental illness is also a significant risk factor for chronic pain. Those suffering from mental disorders are more likely to report chronic pain compared with the general population.\(^37\) Depression and anxiety, for example, are common psychological disorders experienced by persons with chronic pain lasting longer than one year.\(^38,39\)

RURAL-URBAN DISPARITIES

A study of North Carolina residents demonstrated a higher prevalence of chronic pain in rural patients compared with urban residents.\(^20\) Estimates of chronic pain and high-impact chronic pain have been reported to increase in prevalence as location becomes progressively more rural.\(^3\) There are multiple factors that may contribute to this increased rural prevalence. Chronic pain can be the result of employment in jobs that place workers at higher rates of both acute and overuse injuries, such as manufacturing and agriculture, which support many rural residents and communities.\(^40\) Residens in rural areas are more likely to work these or other manual labor jobs that are physically demanding, injury-prone, and therefore more likely to lead to chronic pain.\(^41\) Rural populations are, on average, older than...
urban populations, increasing the age-related risk for prevalence of chronic pain.\textsuperscript{42}

In addition, rural populations suffer from significant primary care shortages that may lead to neglected injuries and subsequent chronic pain.\textsuperscript{41} In terms of treatment for chronic pain, residents in rural areas were less likely to use nonpharmacologic strategies and multimodality therapies for chronic pain compared with urban residents.\textsuperscript{20} Of concern, rural residents are more likely to be prescribed opiates for chronic pain compared to urban counterparts.\textsuperscript{43-45}

**VARIATION BY RACE AND ETHNICITY**

Recent data suggests chronic pain and high-impact chronic pain have the highest incidence in White populations.\textsuperscript{3} In terms of management of acute pain, multiple studies conclude that there are racial disparities in care.\textsuperscript{46-48} Evidence in chronic pain is contradictory, however, with many studies suggesting disparity,\textsuperscript{49-51} some demonstrating that ethnic minorities are less likely to be prescribed opiates,\textsuperscript{49,52-54} and another study demonstrating increased prescribing for ethnic minorities.\textsuperscript{43}

Regardless of the current data, the Centers for Disease Control (CDC) notes that there are long-standing disparities in the treatment of pain for communities of color and that there is “substantial opportunity” for the improvement of care in this area.\textsuperscript{8} Further research should be undertaken related to this critical issue. New research utilizing electronic health record data would help overcome the limitations of patient-reported data\textsuperscript{47} in accordance with the National Institute of Health’s National Pain Strategy.\textsuperscript{7}

**MORBIDITY AND MORTALITY**

Patients with chronic pain suffer from multiple comorbidities. Mental health disorders, for example, are significantly more prevalent in patients with chronic pain.\textsuperscript{55} Risk of suicide is increased in patients with chronic pain.\textsuperscript{56} Besides psychiatric comorbidity, at least one large study demonstrated increased numbers of cardiovascular risk factors in patients with chronic pain.\textsuperscript{57}

Multiple studies demonstrate that various types of chronic pain are associated with increased mortality.\textsuperscript{58-63} This increased risk of mortality may be influenced by lifestyle factors associated with chronic pain, such as smoking, obesity, sedentary lifestyle, and stress.\textsuperscript{64} Functional limitations and inactivity seem to mediate the increased risk.\textsuperscript{61}

**BARRIERS TO CARE**

There are multiple barriers for the care of chronic pain in rural areas. Patients are less likely to have higher educational attainment, more likely to be of lower socioeconomic status, less likely to be insured, and may have difficulties with transportation.\textsuperscript{8} Medical services may simply not be available in some rural areas,\textsuperscript{8} and the ability to utilize nonpharmacologic therapies is often impossible.\textsuperscript{8,45} There is a lack of complementary self-management options for chronic pain in rural settings\textsuperscript{6} which further detracts from the availability of multimodality treatments.

**HISTORY OF CHRONIC PAIN TREATMENT**

In order to understand the current status of chronic pain treatment in rural America, it is important to first understand the history of chronic pain and its treatment in the U.S., especially as it relates to opioid use.\textsuperscript{65}

Multidisciplinary pain treatment has been the main tenet of chronic pain management since the mid-1900s after John Bonica, an anesthesiologist, noted that his own individual management of chronic pain was unsatisfactory and began including other specialties.\textsuperscript{65} This subsequently led to a recommendation for the establishment of interdisciplinary pain centers for management of chronic pain.\textsuperscript{66} These guidelines recommended staffing with at least two physicians, a psychologist, a physical therapist, and any additional providers needed to serve the specific needs of the local population.\textsuperscript{67}

These multidisciplinary pain clinics were deemed a success and had durable results for up to 15 years.\textsuperscript{68,72} However, due to changing reimbursements related to the requirement of current procedural terminology (CPT) codes, multidisciplinary care became markedly less lucrative than both procedural care and free-standing opioid-based clinics.\textsuperscript{65} Primarily due to the financial issues, the majority of
multidisciplinary pain centers were closed in the 1970s and 1980s.

At the same time that multidisciplinary care was decreasing, the long-standing skepticism among physicians concerning the use of opioids in chronic pain was waning. “Pain, the Fifth Vital Sign” was a campaign by the American Pain Society (APS) and called for a change around the use of opioids; the Veterans Health Administration adopted the initiative and lent credence to the campaign. Subsequently, the Joint Commission on the Accreditation of Healthcare Organizations mandated the assessment and treatment of pain in all patients as a prerequisite for receiving federal healthcare dollars.

The APS campaign was combined with several other factors that lead to increases in opioid prescribing. The Federation of State Medical Boards and the Drug Enforcement Agency issued statements to be more permissive concerning the prescription of opioids as a way to address the fifth vital sign. Two studies, both of which were inadequate to evaluate for the addictive potential of opioids, were used by industry to attempt to address the long-held concern that the use of opioids in the setting of chronic pain would lead to a substance use disorder.

Opioid prescribing and opioid use subsequently increased exponentially, with the number of Oxycontin prescriptions going from less than a million per year to over six million per year in the span of five years. Rates of opioid use disorder and opioid overdose subsequently reached epidemic proportions in the U.S. (for additional information see Chapter 2: Addiction). As attempts to curb opioid prescribing were initiated, the number of patients turning to illicit opioids further increased.

In 2016, the CDC released opioid-prescribing guidelines which had unintended consequences for patients. Many health systems, states, and pharmacies enacted new policies that limited opioid prescribing or mandated pain management specialist referral. This led to patients being rapidly tapered off of opioids, or prescriptions simply not being renewed, with significant health risks and consequences such as overdose and mental health disorders. During this time, opioid prescribing decreased significantly for both cancer- and non-cancer-related chronic pain.

In 2022, the CDC released updated guidelines for prescribing opioids for pain. The recommendations concerning chronic pain were significant and directed clinicians to maximize nonopioid and nonpharmacologic treatment options for chronic pain prior to considering opioids. When opioids are being considered, the risks of the treatment must be included in the decision, such as history of overdose, substance use disorder, sleep-disordered breathing, and risk of use concurrent with other sedating medications. The risk versus benefit to the patient should be consistently re-evaluated and if the trial of opioid does not result in the attainment of preset patient goals they should be discontinued in a tapered fashion if physiologic dependence has occurred.

It is important to note that the prescribing of opioids has significant risks. The careful selection of patients who are started on this class of medication is of paramount importance moving forward. Opioids are associated with overdose deaths, other substance use disorders, sexual dysfunction, and fractures. As the dose of these medications increases, so do the risks of overdose, development of a use disorder, and death. There is no definitively safe minimum dosage. Long-term use of opioids (>90 days) significantly increases the risk of opioid use disorder.

Besides the risks, a 2018 study demonstrated that opioids are no more efficacious than nonopioid pharmacologic options in the setting of chronic pain. Indeed, one review noted that no placebo-controlled trial had been conducted to evaluate the effectiveness of long-term opioids.

**EVIDENCE-BASED INTERVENTIONS**

Despite the clinical challenge of prescribing opioids, there are excellent multidisciplinary options for patients experiencing chronic pain.

A six-week self-management training program demonstrated good results in a rural, predominantly geriatric, Hispanic population with chronic pain. Sessions were focused on nonpharmacological interventions such as
stretching, self-monitoring, goal setting, massage, nutrition and health literacy, and exercise.\textsuperscript{84}

An additional six-week chronic disease self-management program based in rural New York was evaluated and demonstrated similar results. A cohort of more than 300 participants with chronic pain were enrolled. The participants were majority female with some college education and an average age of 65 years. The sessions focused on improving self-efficacy in pain management through physical activity, emotional regulation, and communication skills, as well as pain-specific content such as pacing, stretching, and medication usage. The intervention demonstrated durable improvements at six months in pain disability, depression, and self-efficacy.\textsuperscript{85}

A rural study in Alabama of patients with diabetes and chronic pain demonstrated improved pain self-efficacy, functional limitations, and intensity over the 12-month follow up. The cluster-randomized trial included a predominantly African American and female population that received eight telephone-delivered sessions from a peer advisor over 12 weeks. Sessions focused on healthy eating, physical activity, stress management, medication adherence, social support, and interaction with the medical system. The intervention also involved cognitive behavioral therapy directed at replacing negative thoughts.\textsuperscript{86}

The use of eHealth technology has become a worthwhile option to explore for providing alternative interventions to reach underserved populations, as well as educate and train professionals in effective chronic pain management.\textsuperscript{87}

Other self-management or nonpharmacologic interventions have been noted in the literature and recommended.\textsuperscript{88-92} As stated above, many of these interventions, such as small group therapy, cognitive behavioral therapy, physical therapy services, acupuncture, yoga, and chiropractic services are not available in many rural communities and provide actionable goals for the future of care in those settings.

CONCLUSION

Chronic pain remains a devastatingly common disease in the U.S., with higher prevalence and greater severity in rural areas. Treatment of chronic pain in rural settings presents many challenges, including patient demographics, a lack of available medical resources, a lack of multidisciplinary options, and limitations on current epidemiologic knowledge related to rurality and chronic pain.

Future directions should focus on training providers to not initiate opioid medications inappropriately and to avoid abrupt cessation in patients who have been on opioids for long periods of time without careful counseling and follow up. Availability of multimodality treatment options should be developed in rural areas and additional research related to chronic pain will help elucidate prevention strategies and care solutions effective for rural communities as a vulnerable patient population.

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doi:10.3109/09638280902874154


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Related Chapters:
Chapter 1. Mental Health and Mental Disorders: A Rural Challenge
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Suggested Chapter Citation:
Williamson B, Woodland G. The Issue of Chronic Pain in Rural America. Chapter 20 in: Ferdinand AO, Bolin JN, Callaghan T, Rochford HI, Lockman A, Johnson N, eds. Rural Healthy People 2030. College Station, TX: Texas A&M University School of Public Health, Southwest Rural Health Research Center; 2023: pages TBD