Rural Public Health Care

HOW TO RECEIVE CREDIT

- Read the enclosed course.
- Complete the questions at the end of the course.
- Return your completed Evaluation to NetCE by mail or fax, or complete online at www.NetCE.com. (If you are a physician, behavioral health professional, or Florida nurse, please return the included Answer Sheet/Evaluation.) Your postmark or facsimile date will be used as your completion date.
- Receive your Certificate(s) of Completion by mail, fax, or email.

Faculty

Mary Schmeida, RN, PhD, completed her Master of Science in Nursing degree from Kent State University in 1984. Her PhD in Political Science with a specialty tract of Public Policy Analysis and Design was completed in 2005. She has 37 years experience within the U.S. healthcare service delivery system. As a clinical nurse specialist in psychiatric-mental health nursing, she has held faculty positions at the university level and several research positions. Dr. Schmeida has presented numerous research papers in public health policy and healthcare at many conferences across the country. Her research is published in peer-reviewed journals, books, and international government reports.

Faculty Disclosure

Contributing faculty, Mary Schmeida, RN, PhD, has disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

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The division planners and director have disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

Audience

This course is designed for healthcare professionals in all practice settings with patients from rural communities.

Accreditations & Approvals

In support of improving patient care, NetCE is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

As a Jointly Accredited Organization, NetCE is approved to offer social work continuing education by the Association of Social Work Boards (ASWB) Approved Continuing Education (ACE) program. Organizations, not individual courses, are approved under this program. Regulatory boards are the final authority on courses accepted for continuing education credit.

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NetCE designates this enduring material for a maximum of 15 *AMA PRA Category 1 Credit(s)*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Successful completion of this CME activity, which includes participation in the evaluation component, enables the participant to earn up to 15 MOC points in the American Board of Internal Medicine's (ABIM) Maintenance of Certification (MOC) program. Participants will earn MOC points equivalent to the amount of CME credits claimed for the activity. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of granting ABIM MOC credit. Completion of this course constitutes permission to share the completion data with ACCME.

A complete Works Cited list begins on page 58.

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Successful completion of this CME activity, which includes participation in the evaluation component, enables the learner to earn credit toward the CME and Self-Assessment requirements of the American Board of Surgery's Continuous Certification program. It is the CME activity provider's responsibility to submit learner completion information to ACCME for the purpose of granting ABS credit.

This activity has been approved for the American Board of Anesthesiology's® (ABA) requirements for Part II: Lifelong Learning and Self-Assessment of the American Board of Anesthesiology's (ABA) redesigned Maintenance of Certification in Anesthesiology Program® (MOCA®), known as MOCA 2.0®. Please consult the ABA website, www.theABA.org, for a list of all MOCA 2.0 requirements. Maintenance of Certification in Anesthesiology Program® and MOCA® are registered certification marks of the American Board of Anesthesiology®. MOCA 2.0® is a trademark of the American Board of Anesthesiology®.

Successful completion of this CME activity, which includes participation in the activity with individual assessments of the participant and feedback to the participant, enables the participant to earn 15 MOC points in the American Board of Pediatrics' (ABP) Maintenance of Certification (MOC) program. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of granting ABP MOC credit.

This activity has been designated for 15 Lifelong Learning (Part II) credits for the American Board of Pathology Continuing Certification Program.

Through an agreement between the Accreditation Council for Continuing Medical Education and the Royal College of Physicians and Surgeons of Canada, medical practitioners participating in the Royal College MOC Program may record completion of accredited activities registered under the ACCME's "CME in Support of MOC" program in Section 3 of the Royal College's MOC Program.

NetCE designates this continuing education activity for 15 ANCC contact hours.

IPCE CREDIT™

This activity was planned by and for the healthcare team, and learners will receive 15 Interprofessional Continuing Education (IPCE) credits for learning and change.

AACN Synergy CERP Category C.

NetCE designates this activity for 15 hours ACPE credit(s). ACPE Universal Activity Numbers: JA4008164-0000-25-044-H04-P and JA4008164-0000-25-044-H04-T.

Social workers completing this intermediate-to-advanced course receive 15 Clinical continuing education credits.

NetCE designates this continuing education activity for 5 NBCC clock hours.

NetCE designates this continuing education activity for 15 CE credits.

Individual State Nursing Approvals

In addition to states that accept ANCC, NetCE is approved as a provider of continuing education in nursing by: Alabama, Provider #ABNP0353 (valid through 07/29/2025); Arkansas, Provider #50-2405; California, BRN Provider #CEP9784; California, LVN Provider #V10662; California, PT Provider #V10842; District of Columbia, Provider #50-2405; Florida, Provider #50-2405; Georgia, Provider #50-2405; Kentucky, Provider #7-0054 (valid through 12/31/2025); South Carolina, Provider #50-2405; West Virginia, RN and APRN Provider #50-2405.

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Special Approvals

This activity is designed to comply with the requirements of California Assembly Bill 1195, Cultural and Linguistic Competency, and California Assembly Bill 241, Implicit Bias.

About the Sponsor

The purpose of NetCE is to provide challenging curricula to assist healthcare professionals to raise their levels of expertise while fulfilling their continuing education requirements, thereby improving the quality of healthcare.

Our contributing faculty members have taken care to ensure that the information and recommendations are accurate and compatible with the standards generally accepted at the time of publication. The publisher disclaims any liability, loss or damage incurred as a consequence, directly or indirectly, of the use and application of any of the contents. Participants are cautioned about the potential risk of using limited knowledge when integrating new techniques into practice.

Disclosure Statement

It is the policy of NetCE not to accept commercial support. Furthermore, commercial interests are prohibited from distributing or providing access to this activity to learners.

Course Objective

The purpose of this course is to provide physicians, nurses, pharmacists, and behavioral health specialists with the knowledge and skills necessary to provide optimum care to rural residents and to advocate for the needs of this population.

Learning Objectives

Upon completion of this course, you should be able to:

1. Describe the role of the public health professional.
2. Discuss the vital functions of public health.
3. Operationally define rural and urban.
4. Identify varying determinants characterizing rural populations.
5. Describe the chronic illness, tobacco use, and cancer issues of rural populations.
6. Outline the injuries and mental and dental health issues of the rural population.
7. Analyze the access to care service issue for rural areas.
8. Discuss the characteristics and issues of the rural public health workforce.
9. Evaluate the responsiveness of emergency medical services (EMS) in rural regions.
10. Discuss the public health agency, hospital, and the community health center.
11. Describe the health issues of American Indian/Alaska Native (AI/AN) populations and the Indian Health Service (IHS).
12. Identify issues of the aged and U.S. services for the aged.
13. Outline health promotion and disease prevention for the rural population.
14. Discuss how advanced communication technology can improve care access.
15. Discuss initiatives to building rural public health workforce capacity.
16. Discuss schools and rural healthcare providers as community health educators.

Pharmacy Technician Learning Objectives

Upon completion of this course, you should be able to:

1. Identify key terms, services, and issues specific to the rural population and rural public health.
2. Describe public health concerns for specific rural populations, including older adults and American Indians/Alaska Natives.
3. Discuss initiatives and workforce-building approaches to improve rural public health care.

Sections marked with this symbol include evidence-based practice recommendations. The level of evidence and/or strength of recommendation, as provided by the evidence-based source, are also included so you may determine the validity or relevance of the information. These sections may be used in conjunction with the course material for better application to your daily practice.

INTRODUCTION

The U.S. rural population differs from the urban sector on many demographic levels, including age, employment, and access to care services. The cultural context of these communities also differs from nonrural communities and can vary across rural counties. Rural residents rank higher on measures of many chronic illnesses, obesity, and unintentional injuries than urban counterparts. In this context, public health professionals are responsive to the unique and diverse needs of the rural setting, assuming a culturally competent practice to promote health, well-being, and a better quality of life for the rural community. In strengthening the rural health system, a collaborative, multi-method approach that involves public and non-public entities is being taken in many states. As new public health infrastructures are being considered and implemented to strengthen the U.S. healthcare system, the role of the public health professional is evolving.

DEFINITIONS

This section outlines both the roles of public health professionals and the vital services of public health to create a conceptual definition of the public health professional. Different operational definitions of rural are given to illustrate that the "rural" in rural public health is not the same for all public health stakeholders and/or their work cultures. The definition of the term rural provided by the U.S. Census Bureau is a foundation.

THE PUBLIC HEALTH PROFESSIONAL

Public health professionals are an essential part of a changing care system. Newer roles are evolving as the system evolves. Advancing technology, for example, has largely already been adopted by the system, enabling rural public health professionals working in remote areas to connect electronically with other providers from across miles and to more efficiently do surveillance on public health crises, such as the opioid drug crisis. Technology competence is important, as technology changes

are dramatic and rapid. The use of technology in healthcare delivery can assist healthcare systems, organizations, and providers in expanding access to and improving the quality, safety, and effectiveness of rural healthcare [1].

Abbreviated, the duties performed by public health professionals include investigating, surveillance/monitoring, diagnosing, and evaluating community health issues (e.g., environmental health hazards); mobilizing partnerships to resolve issues; promoting a competent workforce; promoting quality services and safety ideals; advocating for population health; enforcing policy and program goals; creating policy; and implementing and evaluating health and social policies related to population health needs [2]. The assessment skills of public health professionals, in addition to their primary prevention focus and system-level perspectives, can influence community health, needs, and assets; diagnose and address health hazards and root causes; and facilitate data sharing and collaboration with partners, including multisector partners [3].

Differing from acute care practice, the public health professional aims to improve population health through prevention efforts and education and by attending to multiple determinants of health [3]. With a multi-level view of health, public health action occurs through community applications of theory, evidence, and a commitment to health equity [3]. The Health Resources and Services Administration defines population health as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group. In this concept, the population as a whole is viewed as the patient" [4]. Public health is the practice of promoting and protecting the health of populations using knowledge and evidence-based research to promote health and prevent disease and disability [3]. Public health professionals practice in state and local health departments, hospitals, schools, homes, community-based health centers, clinics, laboratories, pharmacies, correctional facilities, and other settings [3].

PUBLIC HEALTH VITAL FUNCTIONS

Public health in the United States has many functions. According to the Centers for Disease Control and Prevention (CDC), public health prevents epidemics and the spread of disease, protects against environmental hazards, prevents injuries, promotes and encourages healthy behaviors, responds to disasters and assists communities in recovery, and assures the quality and accessibility of health services [5]. It aims to promote physical and mental health, prevent disease, injury, and disability. The CDC has identified the following 10 essential public health services applied to all entities of public health—national, state, local, and tribes and territories [3; 5]:

- Assess and monitor population health Investigate, diagnose, and address health hazards, (such as infectious water-, food-, and vector-borne disease outbreaks) and root causes.
- Communicate effectively to inform and educate.
- Strengthen, support, and mobilize communities and partnerships.
- Create, champion, and implement policies, plans, and laws.
- Utilize legal and regulatory actions.
- Enable equitable access.
- Build a diverse and skilled workforce.
- Improve and innovate through evaluation, research, and quality improvement.
- Build and maintain a strong organizational infrastructure for public health.

The CDC has provided this guide of vital functions to aid public health workers in their practice, planning, implementation of initiatives, and evaluation of actions. It provides practical direction that can be used across all public health entities in their aim to develop healthy and safe community environments [3; 5].

RURAL AND URBAN DEFINITIONS

The definitions of rural and urban are not the same for all public health stakeholders, as definitions vary among researchers, policy decision-makers, program rule-makers, and practitioners. Rural and urban are multi-dimensional concepts, making clear-cut distinctions between the two difficult. Some prefer the definition to be based on population density, while others rely on geographic isolation [6]. Regardless, the choice of a rural definition should be based on the purpose of the application. This variation in definitions can lead to some level of unnecessary confusion and unwanted mismatches in program eligibility. As such, it is important to familiarize oneself with the definition used at one's public health workplace so as to prevent this confusion [7].

The U.S. Census Bureau has historically taken the lead in defining rural and urban. It uses statistical data to analyze population characteristics and changes in population distribution in the development of their definition. For more than 100 years, since 1910, the Bureau has provided an official definition of urban territory, population, and housing, but over time, they have changed the concept behind their definitions or the methods or classification schema. The U.S. Census Bureau first defines urban areas and defines rural areas as those that are not urban. Urban areas may be further classified as urbanized areas or urban clusters. Rural areas are further divided into three categories: completely rural, mostly rural, and mostly urban [8]. For the most part, the definition of urban is based on residential population density and a few other land-use characteristics (e.g., land cover, airports) used to identify densely developed territory [8]. Rural areas encompass a wide variety of settlements, from densely settled small towns and "large-lot" housing subdivisions on the fringes of urban areas, to more sparsely populated and remote areas [8]. Although some sources interchange the entities nonmetropolitan and rural, the U.S. Census Bureau states that these geographic entities are not identical and should not be used interchangeably [8]. Professionals working with public reports and agency data should familiarize themselves with the particular definition of rural and urban used in the report or data.

The U.S. Census Bureau's urban-rural classification, however, provides a common reference for federal government agencies and departments. For example, it provides public health planning with a base to determine eligibility for participation and level of funding [9]. Still, some U.S. agencies have their own method of defining what is considered urban and rural. In fact, U.S. federal agencies apply more than two dozen rural definitions [6]. One reason for the different definitions is that multi-dimensional concepts and elements are involved, making it difficult to make clear-cut distinctions between the areas. Some people reside in areas that are not clearly distinguished as falling within either urban or rural designations [7].

Some may wonder why clearly identifying rural areas is important, but small changes in how rural areas are defined can have large impacts on public planning and implementation, program budgeting, and candidates for program participation. Specific definitions of rural and urban can be attached to a public program for administrative boundaries and to help guide program rule-making. For healthcare practitioners, specific definitions help guide the delivery of everyday services.

Although the U.S. Census Bureau states that the terms "nonmetropolitan" and "rural" should not be used interchangeably, the U.S. Department of Agriculture (USDA) does interchange the terms [8]. In the creation of its definitions, the USDA analyzes conditions in nonmetropolitan areas, such as trends in population, the economy, and social diversity. The USDA considers counties to be the basic unit of analysis or "standard building block" for their research, but the U.S. Census Bureau uses much smaller geographic building blocks to define rural areas (or counties) as open countryside, rural towns with fewer than 5,000 residents and 2,000 housing units, and urban areas with populations ranging up to 50,000 people that are not part of larger labor market areas (metropolitan areas) [10]. As of 2024, the total population in nonmetro counties stood at 46.2 million [7; 11; 12; 13]. According to the U.S. Census Bureau definitions, most counties have both rural and urban populations.

Other federal offices use still different methodology to define rural/urban. One example is the Office of Management and Budget within the executive branch of the federal government. Much like the USDA, the Office of Management and Budget uses the terminology "nonmetropolitan," but they rely on a regional-economic concept (e.g., labor markets) to delineate the metropolitan-nonmetropolitan classification [7]. The U.S. Department of Health and Human Services uses an urban-rural county-based classification. This method is preferred by this department for many reasons, not least because health data are more readily available at the county level [14].

So, while the U.S. Census Bureau provides a base for a rural and urban definition, definitions vary across agencies and public departments to best fulfill their own purposes. The National Rural Health Association supports the right of "state and federal programs to select the most appropriate methodology to achieve their program goals rather than being constrained to any single methodology" [15].

The term frontier, much like the terms rural, suburban, and urban, is intended to categorize a portion of the population along a continuum. Defining "frontier" is also an important step for program development and implementation, particularly for program funding. Frontier has been defined many ways, including at the county level, by census tract, by ZIP code, and by government criteria. Having many ways to define frontier helps the decision-maker to align the definition to his or her purpose [15]. Examples of criteria that may be used in defining frontier include the travel time for a resident to reach a population center or the weather changes that occur with different seasons that inhibit a resident's travel to reach needed service. These areas generally have unique health and economic goals and challenges and therefore require special recognition [15].

Frontier health professional shortage areas are also important to conceptualize. According to the National Rural Health Association, counties classified as frontier have a population density of fewer than "seven people per square mile across a service area, within which the time and/or distance to primary care is excessive for the residents, and exceeds the national goal of 30 miles or 30 minutes" [11]. The 2010 Patient Protection and Affordable Care Act defines frontier health professional shortage area to mean an area "with a population density less than six persons per square mile within the service area; and with respect to which the distance or time for the population to access care is excessive" [16]. The health professional shortages of primary care, mental health, or dental health professionals, regardless of classification—frontier, rural, suburban, urban, or mixed—can limit service availability for a population. The designation of health professional shortage area may be based on a health professional shortage for a particular population group and/or a shortage for an entire population within a defined geographic area. In some cases, it may be facility-based, such as a Centers for Medicare and Medicaid Services-certified rural health clinic [17].

According to the National Rural Health Association, frontier areas are different from rural areas in that they lack sufficient population numbers to support a range of healthcare services (including primary care services), have less health insurance as compared to rural residents, have less income and more poverty than rural areas, have older populations in demand of health services, and generally lack the capacity to develop and sustain a comprehensive system of care [11]. Historically, public health nurses were the primary support system for frontier health, often providing care via home visits. In 1925, Mary Breckinridge, a public health nurse and midwife, founded the Frontier Nursing Service, which provided nursing care to Appalachian Kentuckians and other underserved and poor regions. The common public health equipment carried by the nurse-midwife on a health visit in the frontier area was two saddlebags; one was for "general health care" and another for newborn deliveries [18]. The 1946 Hospital Survey and Construction Act (i.e., the Hill-Burton program) was specifically created to address the problem of access to health care for war production facility workers who resided in poor, rural areas of the United States [19].

CHARACTERISTICS OF RURAL POPULATIONS

According to the U.S. Census Bureau, and based on the 2009–2023 American Community Survey, there are differences between rural and urban America in terms of demographic, social, and economic determinants (e.g., age, education, income, health insurance) [20; 21]. Rural residents are more likely to be older, married, and not living alone. They tend to have completed less education and have lower civilian employment, lower health insurance coverage, and less Internet access compared with urban residents [20; 21]. The CDC reports that rural Americans tend to show higher rates of cigarette smoking, higher rates of hypertension and obesity, and less access to healthcare services [22]. Negative determinants (e.g., lower employment) place residents at a higher risk for certain public health conditions, such as chronic disease. All these factors can lead to poor health outcomes [22].

It is important to note that rural areas are not homogenous, and determinants (or factors) can vary across rural counties. Understanding the socioeconomic, demographic, environmental, and health conditions that exist for rural and urban populations gives public health stakeholders insight on the disparities and inequalities of groups and largely influences policy and public programs designed to help the public.

DEATHS AND BIRTHS

Rural counties are facing a demographic change, as many have a greater number of deaths than births. Between 2020 and 2024, a natural decrease (births minus deaths) reduced the rural population by 563,550 people [12]. A county population change is reported to include two parts—a natural change (i.e., births minus deaths) and a net migration change (i.e., people moving in minus people moving out). According to the USDA Economic Research Service, the rural population grew approximately onr-quarter percent from mid-2020 through mid-2022, a period of renewed growth after declining or near-zero annual growth rates between 2010 and 2020. The increases in rural population resulted from gains in net domestic migration, which exceeded natural declines. Most rural counties experienced net domestic in-migration, particularly counties located near large urban areas and in recreation and retirement destinations. However, 42% of rural counties decreased in population from net domestic out-migration [13].

MIGRATION, EMPLOYMENT, AND ECONOMIC OPPORTUNITIES

Rural areas experienced COVID-19-related gains despite a population loss due to a natural decrease (-0.09% in 2019–2020 to -0.33% in 2020–2021 and 2021–2022). While hundreds of individual rural counties have experienced a natural decrease for decades, this is a new phenomenon for rural areas as a whole, having first appeared in 2017–2018. Additionally, decreasing fertility rates for the United States overall and an aging population likely means that a natural decrease will be a fixture for rural areas for the foreseeable future. Population growth in rural areas will depend on retaining current residents and attracting new ones [13]. Limited economic opportunities for working-age adults can be an incentive to migrate out of rural areas to urban employment areas [13].

Every 10 years the U.S. Office of Management and Budget (OMB) identifies a new set of urban areas based on the most recent decennial census. Historically, this reclassification has led to large rural population losses. According to an OMB update from 2023, 72 rural counties with more than 2.2 million people were changed to urban status and 52 urban counties with more than 2.1 million people switched to rural status. This net loss for rural areas (162,361 people) is the lowest for any decade since the 1950s, when urban areas were first delineated. This change marks a historic downturn in urbanization during 2010–2020 [13]. Economic recessions have been an incentive for some working-age rural residents to relocate to urban areas in search of employment, and not all relocated residents return to their rural life post-recession. Compared with the economic recovery periods from past U.S. recessions, the recovery in rural growth after the 2008–2009 recession

has been more gradual [12]. The slow employment growth rate (0.5%) in rural areas in 2022 was similar to growth rates in the years between the 2008–2009 recession and the COVID-19 pandemic. By 2019, rural total employment had still not fully recovered from the recession of 2008–2009. By the beginning of 2023, employment levels for rural areas had nearly returned to prepandemic levels, but the recovery varied regionally, from an increase of 7.3% in Idaho to a decrease in parts of Maryland and Illinois by more than 5.0% [13]. The industries that provide the largest share (more than 50%) of rural employment include [23]:

- 14.7%: Private nonfarm industries (e.g., utilities, information, administration, other)
- 13.1%: State and local government
- 10.8%: Retail trade
- 10.6%: Manufacturing
- 9.8%: Healthcare and social assistance

Rural counties have much higher rates of industry dependence, regardless of region. For example, a larger share of rural counties in the Midwest (33%) depend on farming than in other regions (12% in the South; 17% in the West) and a larger share of rural counties in the Northeast depend on recreation (35%) than in other regions (9% in the Midwest; 6% in the West) [23].

Between 2019 and 2020 (the first year of the COVID-19 pandemic), across all age groups examined, urban areas saw larger declines in labor force participation than rural areas, with the largest declines among people 16 to 24 years of age. By 2022, the labor force participation rate for people 16 to 24 years of age in rural areas had recovered to pre-pandemic levels of 2019, but remained slightly below 2019 levels for people 25 years of age and older [24].

AGE AND RELATIONSHIP STATUS

Rural populations are aging due to an increase in the number of older people and a decrease in the number of younger people. In 2023, 21% of the rural population was older than 65 years of age, compared with 17% of the urban population. Between 2010 and 2023, the number of working-age people (15 to 64 years of age) declined in rural areas. In 2010, the rural population was mostly those 45 to 59 years of age and their children (15 to 24 years of age). More recently (2020–2023), the population has shifted older (65 years and older) and many of the younger people have migrated to urban areas [12].

POVERTY

Poverty is defined as "any individual with income less than that deemed sufficient to purchase basic needs of food, shelter, clothing, and other essential goods and services" [25]. According to the U.S. Census Bureau, a higher incidence of rural poverty relative to urban poverty has existed since the 1960s, when poverty rates were first officially recorded. However, over time, the difference in rates has narrowed [26]. Estimates from the American Community Survey indicate that the rural poverty rate was 15.4% in 2019, compared with 11.9% for urban areas. Rural poverty fell three percentage points from 2013, when it reached its 30-year peak of 18.4%. Urban poverty rates declined at a higher rate between 2013 and 2019, causing an increase in the urban/rural poverty rate gap, which was 3.5% in 2019 [26].

In the United States, people living in poverty tend to be clustered in certain regions, counties, and neighborhoods. While the overall poverty rate is higher in rural than in urban counties, the difference varies significantly across census regions. The rural/urban poverty rate gap for the South has historically been the largest. In 2015–2019, the South had a rural poverty rate of 19.7%, nearly 6 percentage points higher than in the region's urban areas. Regional poverty rates for rural and urban areas were most alike in the Midwest and the Northeast in 2015–2019 [26].

Rural counties with a the most severe poverty are mainly concentrated in poor areas of the Southeast, including the Mississippi Delta and Appalachia, as well as on Native American lands. Pockets of high poverty are increasingly found in other regions, such as rural areas of the Southwest and northern sections of the Midwest. Deindustrialization since the 1980s contributed to the spread of poverty in the Midwest and the Northeast. The rapid growth in Hispanic populations over the 1990s and 2000s, particularly in California, Nevada, Arizona, Colorado, North Carolina, and Georgia, also was a contributing factor. Overall, this group tends to be poorer than the non-Hispanic White population [26]. In 2019, 21.1% of children living in rural areas in the United States were living in poverty, compared with 16.1% of urban children. In 2015–2019, there were 138 counties with child poverty rates of 40% or higher; only 11 were urban counties. The remaining 127 rural counties were located primarily in the South (84.3%), with concentrations in Mississippi, Georgia, Kentucky, and Texas. Child poverty rates have been persistently high in these areas, particularly among the Black/African American population. Many rural counties (38) with extreme child poverty (rate of 50% or higher) were in South Dakota, where Native Americans make up the majority of the poverty population [26]. In 2023, the poverty rate for rural children was higher than that of other age groups in both rural and urban areas. This included 1.6 million (19.5%) of rural children younger than 16 years of age, accounting for 26.7% of all rural persons in poverty [27].

The median household income for rural areas is $62,000, while the median household income for urban areas is $84,000 [28]. The prime-age labor force (18 to 54 years of age) is 44.6% of the rural population and 49.7% of the nonrural population. Nearly 40% of households in rural areas have an income less than $50,000. Higher income households are concentrated in nonrural areas [29]. There are 32 states with greater median household incomes for rural households than for urban households [30]. Between 2007 and 2014, rural incomes were highest in rural recreation counties, and incomes were also high in the farming and mining counties [27]. Incomes were lowest in the government-dependent and non-specialized job category for rural counties; these counties have the highest rural poverty rates [27].

EDUCATION

The impact of the pandemic on unemployment rates affect people in rural and urban areas differently and vary by levels of education. Unemployment rates were slightly higher in rural areas (4.1%) than in urban areas (3.6%) prior to the pandemic but reversed during the pandemic. During the second quarter of 2020, unemployment rates increased to 13.% in urban areas and 11.3% in rural areas. The unemployment rate for rural workers with less than a bachelor's degree remained slightly higher (1.2 percentage points) in 2021 than in 2019. For those with a bachelor's degree or higher, the rate was only 0.7 percentage points higher. The urban unemployment rate dropped below the rural rate once again in the second quarter of 2022. Throughout 2022 and into the beginning of 2023, rural unemployment rates remained at their lowest point (3.8%) since before 1990 [13].

INSURANCE COVERAGE

Residents of rural counties still lack health insurance at higher rates than those living in urban areas. About 12.3% of people in completely rural counties lacked health insurance compared with 11.3% for mostly rural counties and 10.1% for mostly urban counties [31]. Improvements in adult coverage are largely attributed to expanded Medicaid enrollment following passage of the 2010 Affordable Care Act [20].

INTERNET ACCESS

Internet access is important for rural persons, because it can be a tool to overcome the geographic distance to many services, such as prevention screening. The COVID-19 pandemic expanded the use of telemedicine rapidly, with use by office-based physicians increasing from 15% of physicians in 2019 to 87% in 2021. Only 37% of adults had used telemedicine in the previous 12 months in 2021. Telemedicine use in 2021 and 2022 was less common in rural areas [27].

RURAL POPULATION HEALTH

Many health characteristics of the rural population differ from urban areas, including chronic illness, tobacco use, obesity, mental health, dental health, and disadvantaged access to the healthcare system. Although these characteristics are important, the population characteristics (e.g., age, employment, Internet access) are the underlying conditions predisposing the group to chronic illness, obesity, and other poor health outcomes. For example, rural populations without Internet access are less likely to attend online prevention teaching on nutrition, and in turn have a greater chance of obesity than those with access to Internet nutrition programs [32].

CHRONIC ILLNESS

Chronic illness is associated with significant morbidity and mortality in rural America. Chronic disease is defined broadly as a condition that lasts one year or longer and requires ongoing medical attention or limits activities of daily living or both. Most chronic disease is found to be related to risky behaviors such as tobacco use, poor diet, lack of exercise, and high alcohol use, and to inaccessible health care [32]. In addition to physical medical conditions, chronic conditions also include problems such as substance use and addiction disorders, mental illnesses, dementia and other cognitive impairment disorders, and developmental disabilities [33]. In rural America, there is a high incidence of comorbidity (i.e., having two or more illnesses at the same time), and comorbid conditions are often chronic or long-term. Compared with urban residents, rural communities have less access to primary care services and prevention programs that are important to mitigating chronic illness [34].

The CDC reports that the leading cause of rural deaths in 2014 was heart disease, followed by cancer, unintentional injury (e.g., motor vehicle accidents), chronic lower respiratory disease, and cerebrovascular accident [35]. The percentages of deaths that were potentially preventable are higher in rural areas than in urban areas [35]. In 2022, many deaths in rural America were potentially preventable, including 20,000 from heart disease and stroke, 6,000 from cancer, 10,000 from unintentional injuries, and nearly 6,000 from chronic lower respiratory disease [35]. Risk factors for death include older age and more illness than urban counterparts; higher rates of cigarette smoking, hypertension, and obesity; less physical activity and seatbelt use; higher rates of poverty; and less access to health care and health insurance [35].

Type 2 diabetes is a chronic illness associated with a variety of long-term complications. Diabetes prevalence is estimated to be 17% higher in rural areas than urban areas [36]. Further, diabetes-related mortality is higher in rural areas, particularly among Black and Hispanic residents [37]. Public health nurses can act to mitigate these conditions with screening, healthy lifestyle teaching, community education on risk factors, and teaching of self-management principles [38].

Chronic lower respiratory disease is a risk factor for long-term disability and a leading cause of rural mortality, with nearly 6,000 deaths reported in 2022 [35]. Rural populations have a higher incidence than urban areas. Chronic lower respiratory disease encompasses a group of respiratory disorders, including asthma, pulmonary hypertension, occupational lung disease, and, perhaps most significantly, chronic obstructive pulmonary disease [39]. Rural economic sectors have specific work-related lung problems. Agricultural workers may develop hypersensitivity pneumonitis and/or idiopathic pulmonary fibrosis after repeated exposures to mold/fungi, animal feed, dust, and pesticides [40]. Exposure to chemicals in manufacturing work can lead to bronchiolitis obliterans (also known as obliterative bronchiolitis or "popcorn lung"), and rural construction and mining industries are at increased risk for pneumoconiosis from inhalation of dust (e.g., silica, coal). Major risk factors for the development of chronic lower respiratory disease include tobacco exposure, occupational and environmental toxin exposures, respiratory infections, and genetic predisposition. Among youth, asthma is one of the most prevalent chronic health conditions [41; 42]. Exposing youth and parents early to prevention programs on respiratory disease can help offset disease.

Arthritis is another prevalent chronic disease in rural America. Arthritis includes more than 100 conditions that affect the joints, tissues around the joint, and other connective tissues [43]. It has significant negative effects for patients, including incurred healthcare treatment costs, the loss of earnings due to limited work ability, impaired activities of daily living, reduced quality of life, and chronic pain. In 2013, U.S. adults with arthritis comprised more than half (53%) of all U.S. adults taking a prescribed opioid [44]. The CDC estimates that more than one in three rural residents have arthritis. Prevalence of the condition increases with age, a considerable consideration given the older median age in rural areas and aging of the U.S. population in general [44; 45].

Interventions for Families

Because chronic illness can vary over time, the medical regimen prescribed to the patient, the prognosis, and the functional capability of the patient will inevitably vary as well. This unpredictability undoubtedly causes stress for every member of the family system. Chronic illness involves a life-long commitment from all parties—patients, their caregiver(s), and their family members. Consequently, it is imperative that all public health professionals involved in the care of rural persons have an understanding of the various types of interventions that can help families and caregivers mitigate the stress brought on by chronic illness, with particular focus on resources for persons who are geographically isolated and/or lack reliable transportation. This section is meant to provide some general guidelines for those who work with families with a chronically ill member.

Providing Information

Families who have members with chronic illness require information. This sounds simple, but it is crucial for nurses to realize that chronic illness is a new and unanticipated event to the family. Therefore, families need concrete information. At the initial diagnosis, the family may be overwhelmed and struggling to come to terms with the illness. They may also be grappling to understand new medical jargon and trying to assimilate a tremendous amount of information in order to make decisions about medical care plans. Over time, some family members may be required to take on more responsibilities related to the medical care, particularly if they live remote to care centers. This requires practitioners to teach family members necessary skills and to provide support when they feel uncertain about these new responsibilities [46]. At this juncture, the nurse should assist in enhancing communication between the primary physician and the family [47]. Technical information about the illness, prognosis, and care regimen should be conveyed. Healthcare professionals should be sensitive to the fact that this information may need to be relayed on several occasions. During this time, the helping professional may want to begin to coordinate a list of resources and referrals [47].

Over the course of the illness, caregivers and family members continue to need information about how to efficiently care for the patient. The types of information may range widely. Lubkin and Larsen, for example, note that healthcare professionals can provide general information about human development to family members. It is beneficial for caregivers and family members to understand normal changes that are part of human development and the life cycle, changes that are specifically related to the illness, or possibly, an interaction of both [48]. Egocentrism, for example, is a part of adolescence. Chronic illness can magnify this as the adolescent receives a great deal of medical and parental attention, and the adolescent can become overbearing [49]. Yet, simultaneously, an adolescent may believe that he/she is the only one with these problems and feel that no one can empathize [49]. Social isolation may occur or be compounded. Therefore, it becomes a complicated issue to determine whether a particular behavioral change is the result of normal human development or illness-related.

Technical information related to the daily care of the patient should also be relayed. Family members may have to be taught how to lift and move patients around without hurting themselves or the patient and how to administer medications [48]. Family members should be reminded and educated about the physical consequences of the illness. Patients, for example, may experience fatigue as a result of the medications and/or the illness; however, some family members may become frustrated with the patient and interpret the patient as being lazy and taking advantage of the sick role [48]. Healthcare professionals should be fully knowledgeable about resources on both the local and national level to assist families in coordinating care for both the patient and themselves. Resources and services include places to access special equipment, legal and financial information, respite care, counseling, and support groups [48].

Exploring the Meaning of Chronic Illness and Ambiguous Loss

The emphasis is to provide an opportunity for family members to explore their feelings of loss, sorrow, mourning, and grief. Interventions also focus on helping families to accept the ill family member's lost physical functioning and capabilities [50].

Boss and Couden argue for the importance of helping families deal with ambiguous loss [51]. The goal is not necessarily to eliminate this sense of loss, but rather, to increase family tolerance and coping. Interventions are both structural/short-term and solutions-focused as well as psychodynamic [51]. After identifying the loss, the family would work collaboratively to make decisions regarding day-to-day care and activities. Operating from this lens, depression, which is commonly experienced among caregivers, may also be viewed as symptomatic of ambiguous loss. Therefore, practitioners can help encourage caregivers to not assume all the burden of responsibility, but rather to delegate and distribute the work. This may mean obtaining respite assistance [51].

One of the more difficult tasks is for family members to understand and make sense of the ambiguous loss [51]. They can begin by looking at their own family's socialization, spiritual and religious values, and mentality of thinking and viewing the world optimistically, and by evaluating the family's beliefs about mastery [51].

Self-Care for Family Members

In order to prevent burnout, family members and caregivers should learn to take care of themselves. Caregivers often experience a host of conflicting emotions, including guilt, sadness, anxiety, and exhaustion. They often feel that they should not express negative feelings, believing that it will adversely affect the patient [48]. Healthcare professionals should routinely ask caregivers how they are feeling and coping, and then validate their experiences and feelings.

Caregivers should also be encouraged to obtain respite care. Respite refers to any type of service, either informal or formal, that offers relief and assistance for family members to cope with the challenges of chronic illness [52]. Informal respite assistance may include extended family members, neighbors, and friends who might periodically help with meal preparations, transportation, or housekeeping. Formal respite consists of in-home respite or out-of-home respite. In-home respite care involves a paid companion who spends time with the patient and helps with the patient's care, while out-of-home respite care includes adult day-care centers and community recreational services [52].

Unfortunately, access to respite care is difficult in rural areas. Caregiver support programs in rural areas often aim to facilitate the development of caregiver support networks, which can provide support and even respite care. The Rural Health Information Hub website contains links to resources to support family caregivers in rural areas (***Resources***).

Adult day care programs are another good option for respite care, but these are rarely a feasible option in rural communities. To overcome this barrier, mobile programs have been developed, with some success. For example, the Georgia Mobile Adult Day Care Program provides adult social day care and respite services to rural Georgia by sharing staff, who travel between locations [53]. Program staff travels up to 50 miles one way each day to deliver services, generally at a senior center in the community. Staffing varies but typically includes a registered nurse (RN), an activity director, an aide, and community volunteers. Caregivers have reported that the mobile adult day care program helped them keep their family member with dementia at home longer, reduced caregiver burden, and provided them with relief and peace of mind [53].

Caregiver support programs in rural areas often aim to teach hands-on caregiver skills, stress management, care management skills (i.e., ability to identify and coordinate care with outside support services), and self-care skills to elders and people with disabilities [53]. Training within these systems can be conducted using videoconferencing, conference calls, in-person meetings, or web-based trainings.

Mindfulness interventions may also be beneficial for caregivers. These approaches teach caregivers to be aware of what is occurring at the moment without any judgement and to focus on regulating emotions. In a study to evaluate the effectiveness of an online mindfulness intervention, the level of caregiver burden was decreased after eight weeks of weekly, one-hour mindfulness practice and self-compassion training [54].

In collectivist cultures, one's identity is intertwined with the ill family member, and how the ill family member fares also affects the caregiver [55]. As such, interventions may target the patient and caregiver simultaneously [55].

Family Therapy

Based on family systems theory, family therapy can be a useful intervention to assist families in acknowledging and accepting the patient's illness as well as the treatment plan and prognosis [47]. It can help families develop coping skills to manage the challenges of the continual stressors related to chronic illness and identify maladaptive family patterns, such as enmeshment, triangulation, overprotectiveness, and rigidity [47]. Role expectations can be clarified among family members, and lines of communication can be opened, and at times, restored, if certain family members feel overloaded with caregiving responsibilities [56]. Furthermore, assuming a caregiving role for an elderly parent may resurrect previous developmental issues [57].

Again, rural families may struggle to identify therapists or to travel to areas offering these types of services. In these cases, Internet or other technologies may be helpful.

Psychoeducational Groups

Psychoeducational groups were first used in families with members who had schizophrenia; however, they have been adapted for use with other clinical populations. Psychoeducational groups typically involve a didactic and support component, whereby family members (i.e., caregivers) convene (in-person or remotely) for 10 to 12 structured sessions, on a biweekly basis [58]. It assumes that the caregivers are experts and each member can help each other [59]. The didactic component focuses on both cognitive information and behavioral change. Caregivers, for example, listen to a series of mini-lectures that focus on disease etiology, treatment, and management [58]. Problem-solving skills and coping strategies are often discussed. Caregivers are encouraged to use these newly learned skills and apply them at home. The support component of the psychoeducational groups provides a forum for family members to talk about various issues that may come up in the caregiving situation. Facilitators and other family members provide validation and recognition of feelings. Ultimately, when family members feel confident about providing care, their quality of life improves [46].

In terms of the research evaluating the effectiveness of psychoeducational groups for caregivers, the findings are mixed. In one study, nurse-facilitated psychoeducational groups for caregivers resulted in no improvements in perceived caregiver burden [60]. But a separate study found participation in distance or in-person psychoeducational groups was associated with improved caregiver distress and burden [61].

Self-Help Groups

Support and self-help groups focus on a specific client population (e.g., patients diagnosed with cancer) and related caregiver needs. These groups are facilitated either by volunteers or healthcare professionals. They may vary but will provide information regarding the illness and disease process and symptom management, normalize members' experiences, provide emotional support around caregiving, encourage advocacy, or a combination of these services [48; 62]. Trust is a key element for these types of groups [63].

Macro-Oriented Interventions

Findley argues that part of their social justice advocacy role for social workers and other service providers is to challenge issues of marginalization when working with families and family members who have been diagnosed with a chronic illness [64]. It is important to advocate reducing or eliminating barriers that prevent families and patients from receiving the care and support that they need. Practitioners can also work to promote evidence-based interventions and guidelines to ensure greater collaboration between patients and their family members at the various levels of care [64].

TOBACCO USE

Since the 1960s, tobacco use has been recognized as the single most avoidable cause of disease, disability, and death in the United States, and tobacco use is considered a prevalent public health concern for both rural and urban America [38]. The CDC reports the prevalence of adult cigarette smoking is higher among those living in rural areas (27.8%) than among those living in urban areas (22.7%) [65]. Smokers in rural areas are more likely to smoke 15 or more cigarettes daily and have a greater chance of developing heart disease, stroke, and lung disease from smoking [65].

The use of smokeless tobacco is also a greater issue for rural adolescents and adults than for their urban counterparts. Smokeless tobacco is defined as tobacco products that are sucked or chewed (not burned) and includes chewing tobacco, snuff, and dissolvables. An estimated 6.3% of rural adults use smokeless tobacco, compared with 2.1% of urban adults [66]. Rates of smokeless tobacco use were highest in West Virginia, Wyoming, Montana, and Mississippi and lowest in Rhode Island, California, and New York [67]. Results of studies suggest that factors other than age, gender, poverty level, and region are driving urban-rural differences in tobacco use. In one study, the most likely reasons given for smokeless tobacco use were affordability, choice of flavors, ability to use in public places (as opposed to smoking), and safety to persons around the user (i.e., no secondhand smoke) [66]. While there may be a perception that these products are safer than smoked tobacco, they contain nicotine, are highly addictive, and have been linked to oral, esophageal, and pancreatic cancers [68].

Nurses and other healthcare providers are responsible for advising smoking parents about the harms of passive smoke as well as how to provide a smoke-free environment for their children [69]. There are many smoking cessation resources that may be provided to patients, including several "quitlines." These hotlines provide free telephone access to a smoking cessation counselor. The National Cancer Institute's quitline is 1-877-44U-QUIT (1-877-448-7848), and both English- and Spanish-speaking assistance is available. The website https://smokefree.gov also offers support, tools, and expert advice through their app, text messaging, and social media networks. Assistance for issues unique to different subgroups, such as veterans, women, adolescents, adults older than 60 years of age, and those who speak Spanish, are also available. To help address the growing issue of smokeless tobacco use in rural adolescents, the U.S. Food and Drug Administration (FDA) started

SCOPE OF OBESITY AMONG ADULTS ACROSS THE UNITED STATES, 2023	
Percentage of Adult Population with Obesity	**Corresponding States**
20% to <25%	Colorado and the District of Columbia
25% to <30%	7 states
30% to <35%	17 and the U.S. Virgin Islands
≥35% to <40%	20 states
>40%	3 states (Arkansas, Mississippi, West Virginia)
Source: [73]	*Table 1*

the Real Cost Campaign, an initiative to educate adolescents (12 to 17 years of age) on the health consequences and risks of cigarettes, e-cigarettes, and smokeless tobacco [70].

OBESITY

Obesity is a priority in chronic disease prevention and has been linked to increased risk for heart disease, hypertension, type 2 diabetes, arthritis-related disability, and some cancers [38]. The 2016 Behavioral Risk Factor Surveillance System found adult obesity is higher in rural areas, with a rate of 34.2% in nonmetropolitan counties and 28.7% in metropolitan counties [71]. In 24 of the 47 states included in the study, obesity prevalence was higher in nonmetropolitan than metropolitan counties. In only one state (Wyoming) was the prevalence of obesity higher for metropolitan than nonmetropolitan residents [71].

The National Health and Nutrition Examination Survey found an association between lower formal education of head of households and an increased chance of obesity in the youth living in the same household [72]. Between 1999–2002 and 2011–2014, obesity increased among both female and male children and adolescents in households that were headed by someone with high school education or less; obesity was also increased among female children and adolescents in households headed by persons with some college education [72].

As of 2023, all U.S. states and territories had an obesity prevalence higher than 20% (more than 1 in 5 adults). Overall, the Midwest (36.0%) and South (34.7%) had the highest prevalence of obesity, followed by the West (29.1%) and the Northeast (28.6%). The District of Columbia and Colorado had an obesity prevalence between 20% and 24%. Seven states had an obesity prevalence between 25% and 29%. Seventeen states and the U.S. Virgin Islands had an obesity prevalence between 30% and 34%. Twenty states, Guam, and Puerto Rico had an obesity prevalence between 35% and 39%, and three states (Arkansas, Mississippi, West Virginia) had an obesity prevalence of 40% or greater (***Table 1***). These states have significant rural populations [73]. Because of its impact on public health, obesity has received attention and funding from the government for public programs designed to mitigate the impacts of overweight and obesity. Rural school programs, for example, receive guidance and funding on obesity initiatives, as schools provide an early opportunity to teach youth and families about healthy eating habits and physical activity.

Ample scientific evidence exists that demonstrates an increasing body mass index (BMI) corresponds to increasing morbidity and mortality. Numerous treatments for obesity are available, but the cornerstone of any treatment regimen is behavioral modification, focusing on diet changes and exercise regimens. Additional therapies include drugs and surgery.

To improve care for overweight and obese patients, nurses should have a thorough understanding of obesity and its treatment and to understand the importance of addressing the topic with patients. In addition, they must recognize that recidivism and failure are quite high and that successful treatment requires a concerted and sustained effort.

CANCER

Although cancer rates are lower in rural areas than urban areas, cancer-related mortality is greater [35; 74]. In particular, higher death rates have been reported for lung, colorectal, cervical, and prostate cancers in rural areas. The highest mortality rates are typically in the rural South. Geography alone cannot predict cancer risk, but it can have an impact on prevention measures, diagnosis, and the treatment opportunities. As such, some cancer cases can potentially be mitigated with public health intervention [74]. Certainly, mortality rates could be improved by ensuring adherence to screening guidelines and access to optimal care. Rural populations more frequently have cancer types related to modifiable behaviors (e.g., tobacco use) compared with urban populations.

Despite decreases in cancer death rates nationwide, a 2017 report shows slower reduction in cancer death rates in rural America (a decrease of 1.0% per year) compared with urban America (a decrease of 1.6% per year) [75]. Many cancer cases and deaths could be prevented, and public health programs can use evidence-based strategies from the U.S. Preventive Services Task Force and Advisory Committee for Immunization Practices to support cancer prevention and control. The U.S. Preventive Services Task Force recommends population-based screening for colorectal, female breast, and cervical cancers among adults at average risk for these cancers and for lung cancer among adults at high risk; screening adults for tobacco use and excessive alcohol use, offering counseling and interventions as needed; and using low-dose aspirin to prevent colorectal cancer among adults considered to be at high risk based on specific criteria. The Advisory Committee for Immunization Practices recommends vaccination against cancer-related infectious diseases including human papillomavirus and hepatitis B virus. The Guide to Community Preventive Services describes program and policy interventions proven to increase cancer screening and vaccination rates and to prevent tobacco use, excessive alcohol use, obesity, and physical inactivity [75].

MENTAL HEALTH

Substance Use Disorders

Substance use disorder refers to a set of related conditions associated with the consumption of mind- and behavior-altering substances that have negative behavioral and health outcomes [76]. Rural areas can vary on type of substance(s) abused. Residents of rural areas are more likely to experience self-inflicted injuries and unintentional opioid overdose deaths than those in urban areas [76].

The rate of opioid misuse and related fatalities are considered public health emergencies in the United States. The general rate of drug use in urban and rural areas rural areas are similar (10.4% and 10.9%, respectively), with the rate of opioid and methamphetamine misuse being roughly the same among the two groups [77]. The rate of drug overdose deaths in rural areas is rising and has surpassed rates in urban areas [78]. Rural areas have a lower percentage of people reporting illicit drug use than urban areas. However, the effects of illicit drug use are higher in rural areas. Among people who had used illicit drugs in the past year, the percentage of people with drug use disorders is similar for rural and urban areas [78]. Socioeconomic factors, behavioral factors, and access to services contribute to these rural-urban differences. An understanding of how rural areas are different when it comes to drug use and drug overdose deaths, including opioids, can help public health professionals identify, monitor, and prioritize their response to the opioid epidemic [78]. To develop this understanding, ongoing data collection, analysis of data, and reporting of findings are critical to staying ahead of the drug crisis in public health.

In the past few decades, the manufacture and abuse of methamphetamine in the United States has gained increased attention. The admissions rates for treatment of methamphetamine-related disorders have ballooned alarmingly in some areas, particularly in rural or frontier areas, causing public health concerns. National reports of methamphetamine use have shown an increase since 2014. Regional use of methamphetamine continues to vary widely, with the highest rates in the West and Midwest, and a strong presence in the Southeast, with rural areas being the most severely impacted. According to a 2020 report, the Northeast, an area previously not a major market for methamphetamine, had seen a recent increase in use rates [79]. Methamphetamine treatment admission rates were higher in 2010 than in 2020 in five states. However, 20 states experienced greater than a 100% increase in admission rates between 2010 and 2020. The West North Central region (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota) had the highest methamphetamine treatment admission rates in 2020 (211 per 100,000 population aged 12 years and older). This region surpassed the Pacific region in 2014 [80].

Methamphetamine users in rural areas, especially areas designated as frontier regions, are likely to experience great difficulty in accessing medical, psychiatric, or substance abuse services. Even self-help groups are likely to be nonexistent in these areas, and when they are available, the degree of anonymity in a 12-step group in a small town may be compromised. The nearest available small city often serves as the population center for the region. Social services in these cities may be overwhelmed by numbers of transient persons from the surrounding rural areas needing services in addition to the inhabitants of the city [81].

Substance abuse treatment approaches should be tailored to meet the needs of the rural population. One such approach, Structured Behavioral Outpatient Rural Therapy, is designed around the use of storytelling activities, a more culturally acceptable form of therapy than the traditional role-playing techniques [56]. Case management and behavioral contracting have also been identified as useful approaches to engage and maintain rural residents in therapy [82]. It is also important that healthcare professionals in rural settings receive the training necessary to effectively diagnose and treat drug-dependent patients. Kentucky and North Carolina have implemented a system by which specialists in substance abuse are available at welfare or social services offices [82]. Other possible approaches in the treatment of rural substance use disorder include treatment of jail and prison inmates and the use of drug courts [82].

To overcome the geographic barriers to accessing mental health prevention and treatment services, federal policies have authorized funding/grants for rural telehealth programs. For example, the USDA has expanded telehealth in addiction prevention and treatment by awarding monies to rural areas for programs and projects combating the opioid issue. They awarded five distance learning and telemedicine grants for treatment in rural central Appalachia, with about $1.4 million in grants distributed in Kentucky, Tennessee, and Virginia [83]. The U.S. Department of Health and Human Services and the Substance Abuse and Mental Health Services Administration are leading a five-strategy evidence-based response to the opioid crisis, which includes approaches to improve patient access to services (e.g., using advanced technology and telehealth) [84].

Suicide

Suicide is part of a broader class of self-directed violence and is defined as death caused by self-directed injurious behavior with any intent to die as a result of the behavior [85]. The means or method used for self-directed violence varies across geographic areas and across age groups [86; 87]. Suicide has no one underlying cause. It occurs in response to multiple biologic, psychologic, interpersonal, environmental, and societal factors that interact with one another, often over time [85; 86]. However, mental illness, particularly major depression, can be a risk factor [85].

Suicide rates have been increasing across the United States, led by areas considered less urban, with the gap in rates between less urban and urban areas widening between 1999 and 2016; furthermore, suicide with a firearm is two times higher among rural residents than those in urban areas. From 2000 to 2018, the rural suicide rate increased by 48%, compared with a 34% increase in the urban rate [85; 86; 88]. While White men are at highest risk for suicide nationally, in rural areas American Indians/Alaska Natives (AI/ANs) are the most affected [85; 86]. Geographic disparities in suicide rates might reflect risk factors known to be prevalent in less urban areas, such as limited access to mental health care, social isolation, and opioid misuse [89]. Addressing the opioid crisis in rural areas is one way of reducing suicide rates.

Many organizations have issued consensus statements regarding screening for suicide risk in the primary care setting. The U.S. Preventive Services Task Force states that although suicide screening is of high national importance, it is very difficult to predict who will die from suicide and has therefore found insufficient evidence for routine screening by primary care clinicians to detect suicide risk and limited evidence of the accuracy of screening tools to identify suicide risk in the primary care setting [90]. The Canadian Task Force on Preventive Health Care found insufficient evidence for routine screening by primary care clinicians to detect depression and suicide risk [91].

However, the American Academy of Pediatrics recommends asking about depression, substance abuse, suicidal thoughts, sexual abuse, and other suicide risk factors during the routine history in all ages throughout adolescence [92]. The American Academy of Child and Adolescent Psychiatry recommends clinician awareness of patients at high risk for suicide (i.e., older male adolescents and all adolescents with current psychiatric illness or disordered mental state), especially when complicated by comorbid substance abuse, irritability, agitation, or psychosis; additionally, screening is recommended in all physical and mental healthcare settings [93]. Finally, the American Medical Association recommends that all adolescents be asked annually about behaviors or emotions that indicate risk for suicide, including adverse childhood experiences [94].

The opportunity for an emotionally disturbed patient with vague suicidal ideation to vent his or her thoughts and feelings to an understanding health or mental health provider may bring a degree of relief such that no further intervention is needed. However, in all cases the encouragement of further contact and follow-up should be conveyed to the patient, especially when inadequate social support is present. Independent of the actual catalyst, most suicidal persons possess feelings of helplessness, hopelessness, and despair and a triad of three cognitive/emotional conditions [95]:

- Ambivalence: Most suicidal patients are ambivalent, with alternating wishes to die and to live. The healthcare provider can use patient ambivalence to increase the wish to live, thus reducing suicide risk.
- Impulsivity: Suicide is usually an impulsive act, and impulse, by its nature, is transient. A suicide crisis can be defused if support is provided at the moment of impulse.
- Rigidity: Suicidal people experience constricted thinking, mood, and action and dichotomized black-and-white reasoning to their problems. The provider can help the patient understand alternative options to death through gentle reasoning.

Healthcare professionals should assess the strength and availability of emotional support to the patient, help the patient identify a relative, friend, acquaintance, or other person who can provide emotional support, and solicit the person's help [95]. The engagement of supportive third parties in the patient's life can be a useful tool in preventing suicide completion.

Family members and friends affected by the death of a loved one through suicide are referred to as "suicide survivors." Research-based estimates from 2023 suggest that 1 in 57 individuals (5.9 million) in the United States are survivors of suicide loss. Additionally, an average of 135 individuals (6.7 million annually) are exposed to or affected by each suicide death [96; 97].

The death of a loved one by suicide can be shocking, painful, and unexpected for survivors. The ensuing grief can be intense, complex, chronic, and nonlinear. Working through grief is a highly individual and unique process that survivors experience in their own way and at their own pace. Grief does not always move in a forward direction, and there is no timeframe for grief. Survivors should not expect their lives to return to their previous state and should strive to adjust to life without their loved one. The initial emotional response may be overwhelming, and crying is a natural reaction and an expression of sadness following the loss of a loved one [97].

Survivors often struggle with trying to comprehend why the suicide occurred and how they could have intervened. Feelings of guilt are likely when the survivor believes he or she could have prevented the suicide. The survivor may even experience relief at times, especially if the loved one had a psychiatric illness. The stigma and shame that surround suicide may cause difficulty among the family members and friends of survivors in knowing what to say and how to support the survivor and might prevent the survivor from reaching out for help. Ongoing support remains important to maintain family and other relationships during the grieving process [96; 97].

Many survivors find that the best help comes from attending a support group for survivors of suicide in which they can openly share their own story and their feelings with fellow survivors without pressure or fear of judgment and shame. Support groups can be a helpful source of guidance, understanding, and support through the healing process [97]. The American Foundation for Suicide Prevention maintains an international directory of suicide bereavement support groups on their website, https://afsp.org.

DOMESTIC AND SEXUAL VIOLENCE

A large national study found that lifetime intimate partner violence victimization rates in rural areas (26.7% in women, 15.5% in men) are similar to the prevalence found among men and women in nonrural areas [98]. In 2020, a national review was published confirming the similarity in prevalence of intimate partner violence; however, it was found that emergency department visit rates were higher in rural areas (15.5 per 100,000 population) than in nonrural areas (11.9 per 100,000 population) [99]. In addition, there is some evidence that intimate partner homicide rates may be higher in rural areas than in urban or suburban locales [100]. This disparity is thought to be a result of fewer preventive and medical services [98; 99; 100].

Substance use disorders and unemployment are more common among perpetrators of intimate partner violence in rural areas [100]. It has been suggested that intimate partner violence in rural areas may be more chronic and severe and may result in worse psychosocial and physical health outcomes. Poverty in rural areas is also associated with an increased risk for intimate partner violence victimization and perpetration for both men and women [101]. Residents of rural areas are less likely to support government involvement in intimate partner violence prevention and intervention than urban residents [100].

Although the rates are similar, the risk factors, effects, and needs of rural victims are unique. For example, research indicates that rural women live three times further from their nearest intimate partner violence resource than urban women. In addition, domestic violence programs serving rural communities offer fewer services for a greater geographic area than urban programs [102].

It is important to assess victims' proximity to available resources and to help in times of crisis. Rural victims may benefit from improved access to services, including technology-based outreach (e.g., videoconferencing, telehealth programs) [103].

MOTOR VEHICLE ACCIDENTS

Motor vehicle crash-related injuries are the leading cause of death among people 5 to 34 years of age [104]. Motor vehicle crash fatality rates are especially high in rural areas and for residents of tribal lands, in part because of poor road maintenance, higher rates of alcohol-impaired driving, lower rates of seat belt and child safety seat use, and less access to emergency response and trauma care [104]. The federal government has committed to supporting state, tribal, local, and territorial agencies in implementing, strengthening, and enforcing transportation safety policies and programs.

Deaths from motor vehicle crashes for drivers or passengers are 3 to 10 times higher in rural America than in urban America, depending on the region [105]. In one study, physical inactivity and lack of insurance were associated with higher rates of motor vehicle fatalities, as was having a more racially or ethnically concentrated population and larger percentages of younger or older adults [106]. Seat belt use has been found to be lower in rural areas, and 61% of drivers and passengers in fatal crashes in the most rural counties in America did not have their seat belts on at the time of the crash [105].

The CDC has developed several resources and tools that states and communities can use to identify effective interventions that might help to address rural-urban disparities in seat belt use and passenger-vehicle-occupant death rates. These include the Motor Vehicle Prioritizing Interventions and Cost Calculator for States, which calculates the expected number and monetized value of injuries prevented and lives saved at the state level after implementation of up to 14 proven strategies (https://www.cdc.gov/transportation-safety/calculator), and the Guide to Community Preventive Services, a collection of systematic reviews of evidence-based findings of the Community Preventive Services Task Force that includes motor-vehicle injury prevention reviews (https://www.thecommunityguide.org).

However, experts have argued that policy interventions to address the rate of motor vehicle fatalities in rural communities should go beyond state laws about seat belts, texting, and similar safety issues, which are important but ultimately will not reverse the urban-rural disparity or eliminate all fatalities [106]. Instead, they recommend a multifaceted approach, including addressing rural transportation infrastructure, access to health care, and emergency response capability.

FIREARM INJURIES AND DEATHS

In the United States, those who live in rural areas are more likely to reporting owning a gun (46%) than those who live in the suburbs (28%) or urban areas (19%) [107]. Gun owners in rural areas are less likely to cite protection as a motivator of gun ownership (62%), compared with suburban and urban residents (both 71%), though it is the most cited reason. They are more likely to report having a gun for hunting or collecting purposes. Regardless of the reasons for owning a gun, the presence of a firearm in the home increases the risk of fatality from suicide, domestic violence, and homicide [108; 109]. For providers devoted to preserving life and promoting health, this can make advising patients in risk situations to remove guns from their home seem ethically self-evident [109; 110].

However, a cultural divide can exist between gun-owning patients and clinicians. For many patients who own guns, gun ownership is a core element of a deeply rooted system of beliefs and values referred to as gun culture. Clinicians who are not part of this culture benefit from an understanding of the perceptions, beliefs, and values of gun culture members before initiating gun safety conversations with their patients. Although difficult for some clinicians, this reflects cross-cultural competence, a core element of patient-centered care. Understanding gun culture can make the difference between reaching versus alienating a patient.

VETERAN HEALTH ISSUES

It is estimated that 4 million veterans reside in rural (nonmetropolitan) America [111; 112]. They are a rapidly aging and increasingly diverse group of men and women who still comprise more than 10% of rural adults, despite consistently declining numbers. A disproportionate share of men and women serving in the military grew up in rural counties and most return home after completing tours of duty [111]. Thus, rural Americans are disproportionately represented in the veteran population, comprising 19% of all U.S. veterans, compared with 16% of the general population [111].

Approximately 2.7 million, or 61%, of rural veterans are enrolled in the Veteran Affairs (VA) healthcare system, with 54% of rural enrolled veterans 65 years and older and 60% affected by a service-related condition. Veterans living in rural areas may have difficulty accessing health services for reasons similar to other rural residents. Some rural veterans face poverty, homelessness, and substance use disorder, which can exacerbate their health issues. In addition, some veterans are unaware of the benefits, services, and facilities available to them through VA [113].

As the number of military conflicts and deployments has increased since 2001, the need to identify and provide better treatment to veterans and their families has become a greater priority. The first step in providing optimal care is the identification of veterans and veteran families during initial assessments, with an acknowledgement that veterans may be any sex/gender and are present in all adult age groups [114]. Unfortunately, veterans and military families often do not voluntarily report their military service in healthcare appointments. In 2015, the American Medical Association updated its recommendations for social history taking to include military history and veteran status [115]. In addition, the American Academy of Nursing has designed the Have You Ever Served? Initiative to encourage health and mental health professionals to ask their patients about military service and related areas of concern [116]. This program provides pocket cards, posters, and resource links for professionals working with veterans and their families.

Several mental health issues are common to veterans of wars, including post-traumatic stress disorder (PTSD), depression/suicide, substance misuse, sexual assault, domestic violence, and intermittent explosive disorder. Military personnel may confront numerous potentially traumatizing experiences, including military-specific events and those experienced by civilians. Research suggests the most common traumatic events experienced during active duty are witnessing someone badly injured or killed or unexpectedly seeing a dead body. Events most likely to result in the development of PTSD include witnessing atrocities, accidentally injuring or killing another person, and other interpersonal traumas, such as rape, domestic violence, and being stalked, kidnapped, or held captive [117; 118; 119].

Exposure to multiple traumatic events is not uncommon during deployment, and exposure to real or threatened death and serious physical injury that can lead to PTSD is likely. Fundamental beliefs about self, the world, and humanity can become severely challenged by the nature of wartime traumatic events, such as exposure to the death of civilians and destruction of communities on an unimaginable scale with little preparation. Veterans may themselves have committed acts of violence they deem with hindsight as atrocities, shattering previously held beliefs about the self [117; 119].

Although the true incidence of suicide among military war veterans is difficult to estimate due to the lack of national suicide surveillance data, the VA estimates that the suicide mortality rate among veterans was 71.8% higher than the rate of nonveteran adults in 2021 [120]. In addition, 12% of all U.S. Army suicides occur within 12 months of hospital discharge [121]. Despite preventive measures taken by the military, the number of suicides in this population continues to increase [112; 122; 123; 124; 125]. Although the majority of military suicides occur among young men shortly after their discharge from military service, military women 18 to 35 years of age commit suicide nearly three times more frequently than nonveteran women of the same age group. In 2021, the suicide mortality rate was highest for service members 20 to 24 years of age [120; 126; 127].

The VA defines military sexual trauma as "sexual assault or threatening sexual harassment experience during military service" [128]. This can include rape (nonconsenting, forced, or coerced sexual activity); nonconsenting, unwanted sexual touching or grabbing, including while sleeping or intoxicated; threatening, offensive remarks about a person's body or sexual activities; and/or threatening or unwelcome sexual advances [128]. In 2024, the Department of Defense received 8,195 reports of sexual assault involving service members [129]. In a survey of 60,000 veterans who served during the Operations Enduring Freedom and Iraqi Freedom eras, approximately 41% of women and 4% of men reported experiencing military sexual trauma [130].

Intermittent explosive disorder is included under the general category of disruptive, impulse-control, and conduct disorders in the revised fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) [131]. Approximately 2.7% of the general public meets the diagnostic criteria for this disorder, but it is much more common among military veterans. In one study of nondeployed U.S. Army personnel, 11.2% of participants met the criteria for intermittent explosive disorder in the past 30 days; it was the most prevalent mental disorder, surpassing PTSD and attention deficit hyperactivity disorder [132].

DENTAL HEALTH

Mouth and throat diseases, including tooth decay, periodontal disease, and oral cancers, cause pain and disability for millions of Americans each year [38]. Poor dental health is associated with impaired intake and systemic disease. As compared to decades ago, dental health has improved across the United States, which is primarily attributed to fluoridation of water and toothpaste and greater awareness of optimal oral hygiene. However, rural areas have a variety of factors that contribute to poor oral health [133]:

- Geographic isolation
- Lack of adequate transportation
- Higher rate of poverty compared to metro areas
- Large elderly population (with limited insurance coverage of oral health services)
- Acute provider shortages
- State-by-state variability in scope of practice
- Difficulty finding providers willing to treat Medicaid patients
- Lack of fluoridated community water
- Poor oral health education

The shortage of dental professionals has resulted in some rural residents seeking dental care at the local emergency department [134]. To address this problem, areas with fewer dental professionals may qualify for a federal dental health professional shortage area designation. Having this designation can qualify the area to receive financial aid or recruitment aid from the government [38; 135].

Although the link between oral health and general health is well-established, the divide between the two fields is great. Many healthcare professionals have not received formal training in oral health. Collaborative care with dental professionals is an essential aspect of improving dental care in rural areas.

ACCESS TO CARE

Access to health care involves many components, including health insurance coverage, having a usual source of care, encountering difficulties when seeking care, and receiving care when wanted [135]. According to the National Prevention Strategy, residents of rural areas are more likely to have a number of chronic conditions and less likely to receive recommended preventive services because of the lack of healthcare professionals and patient care sites in rural areas [104]. Inaccessible service is faced by low-income and disabled populations both urban and rural alike. Despite geographic location and socioeconomic context, preventive health care should be accessible to all people [104].

Disparity is a historic issue for rural counties. As discussed, rural demographic groups have higher disease rates and higher death rates for many conditions than urban groups, and one reason for these disparities is lack of quality care [35]. Differences in health status or treatment outcomes that result in a certain demographic or cultural group experiencing negative health status at a greater rate than another group can be the result of a combination of factors such as age, income, primary language, geographic locale (e.g., rural), gender/sex, or race/ethnicity [135]. The presence of rural health disparities has spurred local and state governments to take steps to ensure that all patients have access to culturally appropriate and evidence-based care; one such approach is improving the diversity and cultural competence of the rural workforce [135].

A more recent disparity is rural access to technology, particularly the Internet. This is important because the Internet is a medium that could be used to deliver public programs to isolated rural regions. Telehealth is greatly dependent on the Internet, promising to improve care access for rural communities by linking services to residents in distant places. Yet, studies show poorer populations (both rural and nonrural) are less likely to have any Internet access than wealthier cohorts. According to the National Rural Health Association, 53% of rural Americans lack access to the bandwidth needed for Internet speed [136]. Additionally, broadband infrastructure is not accessible in all regions and can be as much as three times more costly in rural areas [137; 138]. Broadband deployment in rural areas is catching up but may not keep pace with increasing bandwidth demands of high-quality video, graphics, and data offerings [137; 138].

According to the World Health Organization, telemedicine is an alternative to direct healthcare provision. It reduces the difficulties of access to health services by providing links between patients at the contact point and the medical expertise, wherever it may be.

(https://apps.who.int/iris/bitstream/handle/10665/44589/9789241501514_eng.pdf. Last accessed July 18, 2025.)

Level of Evidence: Expert Opinion/Consensus Statement

Prevention programs are key to public health, but rural residents have less access to these programs [34; 139]. The National Rural Health Association acknowledges that despite the initiation of effective health programs, many rural areas lack the resources required to implement these interventions [140]. Although professional maldistribution, geographic isolation, and physical immobility are being addressed as barriers to accessing care, other barriers exist—for example, insufficient health insurance. The insurance marketplace under the 2010 Affordable Care Act and its expansion of Medicaid eligibility is an example of federal policy to increase access to sufficient health insurance.

Access to public health services is critical to rural population health, but it is incumbent on rural population health providers to expand beyond the traditional healthcare delivery system to address the social and economic conditions of rural communities associated with poor health and poor patient outcomes throughout the lifespan [136]. There is a growing momentum to move beyond disease management and toward disease prevention and population health in rural communities [136].

Transport of Critically Ill Patients

Airplanes, helicopters, and ambulances are often necessary to transport very ill or severely injured patients from rural community hospitals to higher levels of care or specialty service available at larger hospitals. As such, the mode of transportation available can impact rural patient health.

Ground transport is the cornerstone of the emergency response system in the United States. Ground ambulances are accessed by the public through the 911 system and provide rapid stabilization of ill or injured patients. In large urban areas with well-developed prehospital care systems, the time-to-patient is less than 10 minutes. However, as the population base expands into rural areas, the time-to-patient tends to lengthen, delaying access to medical care. To reduce the patient's out-of-hospital time, air ambulances have been developed to augment ground transport programs, providing rapid transfer.

Ground ambulance transport is an efficient and appropriate method of transport for most ill and injured patients in this country. The number of ground transports increases annually and the appropriateness of these transports is unquestioned. However, there are instances in which ground transport is at a disadvantage. Adverse weather conditions can impact the vehicle's ability to traverse certain terrain. At the same time, this adverse weather can prevent air ambulances from flying, leaving ground transport as the only viable option. Time-in-transit is another drawback of ground transport. Some critically ill or injured patients cannot withstand the stressors of transport and the shorter the out-of-hospital time, the better that patient's chance for survival. Finally, when choosing to utilize a ground ambulance, the needs of the community should be examined. Some isolated rural areas have only a single ground ambulance to service a largely scattered population base. If this vehicle is taken out of service for an interfacility transport, the people of the community are temporarily left without the medical coverage they have come to expect.

Air transport should be considered an adjunct to, not a replacement for, ground transport. There are inherent dangers in transporting by air, and it is an expensive alternative. Many third-party providers are withholding reimbursement for flights, which are considered nonemergent. The advantage of fixed-wing transport is the ability to travel long distances at speeds between 250 and 570 miles per hour. Care is usually provided in a pressurized cabin with sophisticated on-board medical equipment. Many aircraft utilized for air transport of patients have the capability of transporting multiple patients, and in some instances, family members are allowed to accompany the patient. All-weather navigational equipment allows for the transfer of patients during inclement weather. Many of the dedicated aircraft utilized in air transports have been referred to as "flying ICUs."

Fixed-wing transport requires suitable airfields to ensure the safety of the crew and patient. Accessibility to such fields may be a problem in isolated areas. Optimally, a 5,000-foot paved runway located near the site of the patient would erase the disadvantages of air transport. However, because hospitals are located a considerable distance from most airfields, ground transport is utilized at the beginning and the end of the air transport. (Note: A unique situation exists in Anchorage, Alaska, where a regional referral medical center is located on the edge of an appropriate airfield and the patient can be off-loaded from the plane and wheeled directly into the hospital. This is far from the norm.) The patient should be moved in and out of the aircraft to a waiting ground ambulance and then transported from the referring hospital or to the receiving hospital. This increases the likelihood of the dislodgement of tubes, lines, etc. There is an additional cost associated with this supplemental ground transport.

Rotor-wing vehicles provide rapid point-to-point transfers. Helicopters are capable of reaching most areas and can bypass difficult terrain. Landing zones can be made at or near the site of the patient to prevent lengthy ground transport times. Most helicopters operate within a 150-mile radius of their base station to allow for routine flights without

HEALTHCARE WORKFORCE IN RURAL VS. URBAN AREAS, 2021–2022		
Profession	**Rate in Urban Areas (Per 100,000 Population)**	**Rate in Rural Areas (Per 100,000 Population)**
Primary care physicians	78	51
Physician assistants	34	53
Registered nurses	64	98
Nurse practitioners	***112***	***90***
Licensed practical/vocational nurses	***21***	***18***
Dentists	***78***	***47***

Source: [125; 144; 147] *Table 2*

refueling. The type of helicopter utilized by a transport program is determined by a number of factors. Most programs now rely on twin-engine helicopters for their enhanced performance and safety records. Certain helicopters perform better at altitude; they are utilized in areas of high terrain, such as in the Rocky Mountains or in the Swiss Alps. The highest helicopter rescue was performed in 2010 at 23,240 feet (density altitude) for injured climbers on the Kamet glacier in the Himalayas. In 2013, a simulated rescue was performed at 25,590 feet on Mt. Everest; however, the practical limit for safe rescue operations is generally agreed to be 23,000 feet [141].

The single largest disadvantage of helicopters is their dependence upon certain minimum weather conditions; if these conditions are not met, the weather can cause delay or cancellation of the flight. Helicopter cabin size often restricts access to the patient once the patient has been loaded into the helicopter. This limited access reduces the number of in-flight interventions possible. Weight limitations restrict the number of passengers and the amount of equipment on board. When transferring a patient by rotor-wing vehicle, comprehensive stabilization of the patient is required prior to departure.

As healthcare dollars become tighter and legislation mandates transport of patients to better-equipped facilities, those caring for patients who need transport should be cognizant of the advantages and disadvantages of the modes of transport. As air ambulance programs continue to proliferate in this country (although the number of programs has leveled off in the last few years), the preparation to choose between ground, helicopter, or fixed-wing transport will be important.

CHARACTERISTICS OF THE RURAL HEALTHCARE SYSTEM

THE PUBLIC HEALTH WORKFORCE

One characteristic of the rural healthcare system is the public health workforce, which encompasses all persons involved in the public health system, including local boards of health, other governance bodies, and non-governmental organizations. Many healthcare professionals contribute to the public health workforce, including nurses, physicians, social workers, pharmacists, and psychologists [140].

A chief characteristic of the rural health workforce is one of maldistribution (***Table 2***). In most of the country, health professionals concentrate in urban areas, creating an insufficient supply and unequal distribution of primary healthcare providers [142; 143]. This disparity is expected to grow as a result of demographic changes, insurance coverage expansions, and a decline in the primary care physician workforce [125; 144]. Specialists and subspecialists are particularly limited in rural areas, as they tend to concentrate in areas with larger population bases where they have enough demand for their services to be economically viable [145; 146].

Rural counties are also historically disadvantaged in terms of mental health services [138]. As of August 2024, 122 million Americans live in areas with an insufficient number of mental health providers; this shortage is particularly severe among low-income rural communities [148; 149]. Americans living in rural counties are more likely than those in urban counties to receive behavioral health services from primary care providers [149]. Rural Americans with mental health needs typically enter care later, have more serious symptoms, and require more costly and intensive treatment [144]. Patients in rural care settings are also more likely to be given pharmacotherapy for psychiatric illness due to a shortage of professionals qualified to provide psychotherapy.

As noted, rural areas lacking health professionals may meet the criteria to be federally designated health professional shortage areas. The U.S. Department of Health and Human Services defines a health professional shortage area as having shortage of primary care, mental health, and/or dental providers [150]. These shortage areas may be designated based on geographic characteristics, population characteristics (e.g., low income), or service availability (e.g., a specific type of facility not having the professional workforce to meet needs) [150]. These medically underserved areas are more likely to see unfavorable clinical outcomes.

The World Health Organization recommends that health professionals practicing in well-served areas in secondary-level or tertiary-level facilities can support their colleagues working in rural areas but also serve the population directly. Physical outreach strategies can include remote day consultations, rotation in health structures, and mobile clinics.

(https://apps.who.int/iris/bitstream/handle/10665/44589/9789241501514_eng.pdf. Last accessed July 18, 2025.)

Level of Evidence: Expert Opinion/Consensus Statement

Workforce shortages are common in rural communities; however, there is variation among rural communities when it comes to the adequacy of their workforce supply. Some communities rarely experience supply issues, while others experience persistent shortages [147]. Rural healthcare facilities need to employ an adequate supply of trained and educated healthcare professionals to meet the needs of the community. Strategies for optimizing the rural healthcare workforce include [147]:

- Use interprofessional teams for coordinated and efficient care and to extend the reach of each provider.
- Ensure that all professionals practice to the full extent of their training and scope of practice.
- Remove state/federal barriers to professional practice, where appropriate.
- Allow for expansion of existing scopes of practice when evidence indicates it leads to provision of comparable or improved care.
- Remove barriers to the use of telehealth services to improve provider access.

Frontier and rural communities have a greater likelihood of experiencing workforce shortages than urban areas for many reasons. Most rural areas cannot compete economically with urban areas for practitioners, and urban practitioners may not have the training preparation to cross over into rural health care [151; 152]. Policy solutions aimed at reducing shortages in these communities should consider that healthcare provision in a rural environment is different from healthcare provision in an urban environment. Solutions that emphasize improving competitiveness may be short-lived and only draw practitioners away from and exacerbate the shortage elsewhere—possibly other rural and frontier areas [151; 152]. To improve the healthcare workforce capacity in rural communities, stakeholders should focus on community-based development approaches. Approaches failing to address the well-being of the community in a holistic sense will not improve shortages over the long term. Building the

capacity of the public health workforce is a priority policy solution [138]. An adequate rural workforce supply is expected to offset the shortage of preventive services and to prevent hospitalizations [153].

Nurses

Nurses comprise the largest sector of the rural health workforce. According to the U.S. Census Bureau, the greatest portion of the civilian workforce in rural counties (22.5%) is employed in education and health services, which includes physicians, nurses, social workers, home healthcare providers, and school teachers [21]. Studies project by 2037, some states will have a workforce shortage in RNs and licensed practical or vocational nurses (LPNs/LVNs).

The U.S. Department of Health and Human Services projects a national RN deficit (shortage) of about 6% of the projected need and a national LPN/LVN shortage of 28% of the projected need by 2037 [151]. However, these projections are national and do not necessarily reflect the projected supply or demand for rural areas. In predicting change between 2022 and 2037, the 10 states who will have the largest projected RN shortages in 2037 are North Carolina (22%), Washington (22%), Maryland (20%), South Carolina (19%), Michigan (19%), New Mexico (19%), Oklahoma (18%), California (18%), Idaho (17%), and Georgia (17%) [151].

As with RNs, the projected adequacy of supply for LPNs/LVNs varies considerably across states, ranging from 20% (an 80%) shortage in Maine to 117% (a 17% oversupply) in West Virginia in 2037 [151]. The demand for LPNs is projected to increase faster than supply between 2022 and 2037, resulting in a shortage of 302,440 in 2037. Nationwide, the projected supply of LPNs in 2037 is enough to meet only 64% of demand, compared with 80% in 2027 [151]. The growing demand for LPNs/LVNs by 2037 is driven by many determinants, perhaps most importantly a growing and aging population, resulting in increased health service needs in nursing homes, residential care, and hospital settings [151]. Emerging healthcare delivery models are expected to contribute to a new growth in demand for nurses (e.g., with nurses taking on new and increased roles in prevention and care coordination) [152]. Evaluation of these new delivery models and their impact on nurse supply will be needed in the future.

Physicians

Across all physician specialties in the United States, there is a projected shortage of 187,130 by 2037, with rural areas experiencing greater shortages (60%) compared with urban areas (10%). An estimated 31 of 35 physician specialties are projected to have shortages by 2037 [154; 155]. A substantial and increasing amount of behavioral health and obstetrics and gynecology services in rural areas are being provided by primary care physicians, who themselves are projected to be only 73% adequately supplied in 2037 [156]. Some physician shortages may be mitigated by the increased use of nurse practitioners (NPs) and physician assistants (PAs) to perform certain services as the scope-of-practice for NPs and PAs has increased in recent years [155].

Behavioral Health Practitioners

Even as the United States is experiencing a mental health crisis, there is an increased level of unmet behavioral health needs. The capacity of the behavioral health workforce is limited by supply and distribution challenges, that extend beyond supply and demand and include both patient-level barriers (e.g., stigma and ability to pay) and provider-level barriers (e.g., limited scopes of practice, reimbursement challenges, burnout) [149]. Substantial shortages of all behavioral health practitioners, including addiction counselors, marriage/family therapists, mental health counselors, psychologists, psychiatrists, and school counselors are projected by 2037. Again, rural counties are more likely to be affected than urban counties, and residents in rural counties are more likely to receive behavioral health services from primary care providers [149]. The opioid epidemic, mental health crisis, and COVID-19 pandemic all exacerbated behavioral health needs. In 2023, an estimated 59 million adults (23% of all adults) in the

United States had a mental illness and nearly one-half (46%) received no treatment [149]. A variety of factors contribute to limited access to appropriate behavioral health care, including provider shortages, high out-of-pocket costs for patients, and gaps in health insurance coverage. Rural counties are more likely than urban counties to lack behavioral health providers. As of 2021, 69% of rural counties lacked psychiatric mental health NPs, 45% lacked psychologists, 22% lacked social workers, and 18% lacked counselors [149]. Substantial shortages for the behavioral health workforce are projected to continue into the future [149].

Pharmacists

In 2018, there were 63,218 retail pharmacies in the United States, with 11,489 located in rural communities [157]. By 2023, that number had declined to 60,755 retail pharmacies overall (a reduction of 3.9%), with 10,808 of those located in rural communities (5.9% reduction). Although the overall number of rural communities with retail pharmacies changed little between 2018 and 2023, there was a significant number of changes within communities. In the five-year period, 184 rural communities lost all of their retail pharmacies (three places lost two pharmacies), and 195 rural communities gained retail pharmacies (three places gained two pharmacies). Approximately two-thirds of the rural communities that gained a retail pharmacy (69.5%) or lost a retail pharmacy (63.5%) were located in the smallest rural communities and in independently-owned pharmacies [157].

The supply of pharmacists nationwide is projected to nearly equal demand (96% adequacy) through 2037 [158; 159]. Rural community pharmacists and pharmacies face many challenges, including declining rural populations, increased competition from Internet and chain store pharmacies, low profit margins, and difficulty in finding replacement pharmacists for those who retire [160]. Because some counties are very large, the presence of a retail pharmacy may hide the fact that services are still quite distant for some residents [157].

Emergency Medical Services

Emergency medical services (EMS) are defined as the practice of medicine involving the evaluation and management of patients with acute traumatic and medical conditions in an environment outside the hospital (prehospital). It combines the disciplines of public safety, acute patient care, and public health [161]. In rural trauma care, rural hospitals are integrated with the local rural public health system, working as part of the state and local trauma care system to provide a collaborative approach to care.

Emergency response services are a vital part of the rural healthcare system. The goal of the EMS system is to provide a coordinated, timely, and effective response to medical emergencies. As discussed, the distances between population centers and the need to transport patients from hospitals and nursing homes in small communities to larger facilities make these services essential in rural areas [162]. Advanced life support units respond to life-threatening events requiring immediate attention (e.g., stroke) and aim for an immediate response time. Rural factors such as difficult geographic terrain, a longer travel time to patient and/or facility, and weather-related factors can be potential barriers for an optimal response time. For prehospital EMS, travel time and distance to the patient location alone can far exceed an eight-minute threshold [163].

Persons living in rural areas have an increased need for prehospital care and emergency transport. Rural residents tend to be older, poorer, and sicker than those living in urban areas [164]. The death rates for rural unintentional injuries (e.g., motor vehicle crashes, drug overdose) are about double that of urban areas [162]. Residents not able to access emergency or prehospital services (e.g., for an acute cardiac event or stroke) are more likely to experience an unfavorable clinical outcome. Furthermore, patients with restricted access to medications, equipment, or special care they need (more common among rural patients) are at increased risk of complications and death during an emergency [162].

The EMS workforce is fewer in number in isolated rural areas as compared to the workforce in larger rural or urban areas. Mostly volunteers, rural prehospital EMS providers often struggle with recruitment, training, and retention of a sufficient workforce to meet the needs of the local population [165]. Medically underserved areas such as isolated rural areas have a greater chance to see negative clinical outcomes because of barriers to timely care as compared with urban areas with fewer barriers. The EMS rural staffing concern is not limited to EMS but is part of the larger picture of a rural-urban disparity in all healthcare staffing.

This unequal distribution of medical specialists, hospitals, and care resources (including EMS) has been defined as a policy problem by the U.S. government, which has passed legislation to advance communications technology as part of the solution. Telemedicine promises to overcome the rural unevenness of professionals and to be a less-costly alternative than recruiting a larger rural workforce. In fact, the original goal for telemedicine was to improve the consumer access to care professionals for those living in federally designated professional shortage areas and other underserved areas [138]. In the context of emergency services, technology can connect the EMS workforce to emergency medicine at a distant site. Device technology can capture various physiologic data, including image, sound, or video, for transmission to emergency centers for immediate interpretation, diagnosis, and instruction to field personnel. Technology enables e-consultation in the field when needed, making it more feasible to treat the geographically isolated patient before arriving at the hospital and ultimately improving outcomes [161].

Dental Workforce

There are fewer rural dentists (per capita) available to address oral disease than in urban settings, and the majority of dental health professional shortage areas lacking access to dental services are rural [166]. As of 2022, an estimated 11,700 additional dentists are required nationally to meet care needs [153; 166]. Dental therapy is the addition of mid-level providers to the dental healthcare system. Like physician assistants in medicine, dental therapists are able to provide preventive and restorative care, such as filling cavities, placing temporary crowns, and extracting badly diseased or loose teeth. Several states have passed legislation authorizing dental therapists to practice in their states, and dental therapists are also authorized to practice in several tribal communities in which access to care can be especially limited [167; 168].

PUBLIC HEALTH AGENCIES, HOSPITALS, AND COMMUNITY HEALTH CENTERS

Public health agencies, rural hospitals, and community health centers are key players in the rural health infrastructure. Although many rural hospitals have closed, other entities and solutions are being established to meet the needs of the rural population. Ideally, these entities work collaboratively in the rural community toward promoting public health, well-being, and quality of life.

Public Health Agencies

The U.S. public health system broadly consists of the public, private, and voluntary bodies contributing to the delivery of health services within a jurisdiction. Providing optimum care requires a collaborative and well-coordinated effort among the multiple stakeholders involved in the system. U.S. government agencies and departments at all levels guide and oversee public health. Federal agencies work in alliance with state and local agencies to provide guidance and support on issues such as workforce recruitment and retention, infrastructure, funding of public services, and information technology use [169].

Of the many federal agencies involved in public health, the CDC guides health promotion, prevention, and preparedness actions. The CDC provides public health resources, including the Public Health Workforce Development, to strengthen and develop the public health workforce through historical literature, reports, guidelines, global and local health data for research, legislation, and policy [170].

The USDA also provides financial support and guidance for rural communities through its Rural Development program. This program supports loans to businesses, technical aid to agriculture producers, affordable housing, home safety and health repairs, public safety services, first responder equipment, and a spectrum of infrastructure assistance that addresses the social determinants of rural health [171].

The U.S. Environmental Protection Agency (EPA) is also an important part of the federal infrastructure to improve the health of rural communities. It protects the health and environment with guidance, oversight, and programs that ensure clean air, land, and water, making community life safer and healthier [169].

In all, the federal government has assumed many responsibilities to improving national public health. These agencies ensure all levels of government have the capability to provide essential public health services and respond to emergencies and are supportive to all government levels with scientific research [5].

Although all levels of government work together to support the mission of promoting public health, the state or local health department retains the primary responsibility. State governments vary in the extent of their authority over local health agencies and the types of partnerships and collaborations they engage in with other government and non-government entities [5]. In 2019, the 50 state public health agencies included 2,809 local health departments and 425 regional or district offices, with 71% being freestanding and/or independent agencies and 29% having a unit of a larger combined health and human services organization or umbrella organization [5; 172].

Each state health agency is led by an appointed state health official. State agencies collaborate with a variety of local stakeholders (e.g., local public health departments, hospitals, provider practices/medical groups, community health centers). Today, more states are sharing resources (e.g., surveillance data) across state lines and are collaborating with each other to form multi-state response teams for hazards and health emergencies [172]. States and their territorial agencies engage in a variety of actions to promote resident health—disease screening, primary prevention initiatives, providing treatment for disease, state laboratory testing, technical assistance and training to the workforce, epidemiology and surveillance, and vaccine management and inventory distribution [5; 172].

Local public health infrastructure can vary. Within a state, local health departments can take on a variety of structural arrangements. For example, some local health departments have more decision-making authority and are locally led by their government for funding; other local departments are parts of the greater state health department (referred to as centralization). Theoretically, with centralization, funding and decision-making is centralized at the state level. Still other local departments fall under a mixed or shared structural decision-making arrangement in their state [5]. Local public health agencies receive oversight from the local board of health. As a legal oversight authority, the roles of the local board of health are many and include recommending public health regulations and policy; collaborating with health departments on strategic planning; and recommending and approving the health department budget [5]. The National Association of Local Boards of Health is considered the grassroots of public health and is the national voice for effective and competent public health governance [173]. A functional public health system is expected to have a strong working relationship with the other bodies. Communications channels and the communication feedback loop ideally involve the many public health players and allows for a sharing of objectives and a pooling and sharing of resources [5].

Rural Hospitals

Rural hospitals are a source of primary care for rural populations; in some areas, they are the only source of care. However, rural hospitals have faced many challenges, mostly due to financial pressure. According to the National Conference of State Legislatures, rural hospitals are closing or no longer providing

inpatient care at an increasing rate. Between 2010 and 2019, 120 rural hospitals closed or ceased providing inpatient services across 31 states, and 1 in 4 rural hospitals are at risk of closing. Twenty rural hospitals were closed in Texas, 13 in Tennessee, 8 in Oklahoma, and 7 each in North Carolina and Georgia [144]. In other words, many of the rural hospitals vulnerable to closing are in communities already facing care access issues. This number of vulnerable closings translates to about 700,000 rural residents facing closure of their nearest hospital emergency room, often used for many medical reasons (even dental care). Without an alternative, many residents will have no source of care. In response, the health system is searching for the best alternative(s) to the financially unsustainable rural hospital, such as converting hospitals to emergency or urgent care stand-alone centers, telehealth services, outpatient centers, and skilled nursing facilities [144]. These models may offset the rural community losing their care and are generally more cost-effective. As discussed, telehealth as an alternative model of care (or medium to deliver care) has the potential to offset a number of rural hospital closure issues. It can make healthcare delivery less costly and more efficient, reach more people, and bring better quality of care into the home. Telehealth as a quality improvement component can bring system-wide, sustainable improvements in access to care [138].

Community Health Centers and Community Health Workers in Rural Settings As part of his war on poverty, former President Lyndon B. Johnson signed into effect the Economic Opportunity Act of 1964, which was the conception of the community health center. Soon after, the first center opened. Aimed to reduce disparities to care across all geographic areas in the United States, community health centers deliver primary care and prevention services to the most vulnerable populations [174]. Community health centers are defined as community-owned, locally administered medical clinics where people can receive preventive care, free vaccine clinics, health alerts, disease screening, and counseling [175]. In 2023, community health centers serviced more than 31 million people across the United States and its territories [176]. Federally qualified health centers are community-based, nonprofit or public organizations located in areas where private health providers lack financial incentives to operate, including sparsely populated rural locations with fewer patients or areas where there are high rates of publicly insured or uninsured patients [177]. To assure that these centers are bridging gaps in care provided by the private market, they are required to serve federally designated medically underserved areas or populations [177]. Health centers can help narrow disparities and rural hospital closings, hospitalizations, and emergency department visits for conditions that can be managed by preventive or primary care [143]. The center is an example of a well-coordinated, comprehensive care model that integrates services from various disciplines such as primary care providers, behavioral health practitioners, and dental professionals [176].

The role of these community-based and patient-directed organizations is to provide comprehensive, culturally competent, high-quality services, many times integrating access to pharmacy, mental health, substance use disorder, and oral/dental health services in areas where economic, geographic, or cultural barriers limit access to affordable healthcare services [174]. Compared with other primary care facilities, community health centers provide more screening for diabetes, hypertension, and breast and cervical cancer, and 80% of centers outperform benchmarks on diabetes control [175]. Even while serving more complex patients and more chronic illness than other primary care providers, community health center patient outcomes are reported to be the same or better than the outcome levels of outside providers [175]. One in seven people served by a community health center are rural residents, and because these community health centers are locally governed, the services they provide are more likely to be tailored to meet the needs of the local population. A common element across rural hospitals, clinics, and community health centers is their focus on the local community [136].

The community health center can also be an important economic force in a community, offering employment and training opportunities and purchasing local services [177]. Building the economic force of a rural community is as important as obtaining access to care, particularly because community health is a multi-dimensional concept taking into account socioeconomic determinants [144]. In all, these centers advance a coordinated, comprehensive, patient-centered care model [176]. Although rural community health centers may provide primary care in rural settings, it is important to remember that a responsive rural health delivery system requires collaborative efforts of clinical and behavioral health providers, public health, education, local businesses, and community-based organizations [178].

Other health centers are rural health clinics and school-based health centers, which consist of clinics in schools working to provide primary care and preventive services for youth. Services provided in school settings are broad and not limited to school health education; primary medical care for conditions such as asthma, substance use disorders, and dental care may be provided [144; 177].

Aside from community health centers, schools, and rural hospitals, other creative solutions are being explored to promote the health and well-being of rural communities. Regardless of the mode of care delivery, these efforts are characterized by collaboration and a flexible infrastructure.

INDIAN HEALTH SERVICE

Compared with other Americans, AI/AN populations have long experienced lesser health and quality of life, having a greater proportion of disease burden and a lower life expectancy [179]. For example, AI/AN individuals are more likely than other Americans to die from chronic liver disease and cirrhosis, diabetes, unintentional injuries, assault/homicide, intentional self-harm/suicide, and chronic lower respiratory diseases [179]. Across all racial/ethnic groups in the United States, AI/ANs have the highest percentage of type 2 diabetes, which can lead to many complications and exacerbation of other chronic illnesses. As compared with the general population and other racial/ethnic groups, AI/AN children are disproportionately affected by dental disease, and oral health for school-aged children 6 to 9 years of age did not change significantly between 2012 and 2017 [180]. The compromised health of this population is believed to be rooted in historic economic adversity and poor social conditions [179].

The federal health program for AI/AN patients is the Indian Health Service (IHS). An agency within the U.S. Department of Health and Human Services, the IHS assumes the large share of responsibility for the well-being of AI/AN populations (rural and urban) by providing a comprehensive health service delivery system for approximately 2.8 million of the nation's estimated 3.7 million AI/AN in 574 federally recognized tribes in 37 states [181; 182]. The IHS is the 17th largest healthcare system in the United States [183]. The provision of health services to members of federally recognized tribes grew out of the special government-to-government relationship between the federal government and Indian tribes, which has its foundation in the U.S. Constitution [181; 182].

There is an infrastructure of entities within the IHS, including tribal health organizations, IHS units, Indian health boards, and the Tribal Health Department, which operates under the jurisdiction of a federally recognized tribe or an association of these tribes and receives funding to operate from the IHS [5]. In all, many partnerships have been created to meet the needs of AI/AN citizens, but the IHS is considered the primary program for this population.

A person may be regarded as eligible and within the scope of the IHS health care program if he or she is of AI/AN descent and belongs to the Indian community served by the IHS program, as evidenced by such factors as [184]:

- Membership, enrolled or otherwise, in an AI/AN federally recognized tribe or group under federal supervision
- Resides on tax-exempt land or owns restricted property
- Actively participates in tribal affairs
- Any other reasonable factor indicative of American Indian descent

In addition, care and treatment of non-Indians shall be provided for children, spouses, and pregnant women meeting certain requirements. This includes any individual who is 18 years of age or younger; is the natural or adopted child, stepchild, foster child, legal ward, or orphan of an eligible Indian; and is not otherwise eligible for health services provided by the IHS [184]. Any spouse, including a same-sex spouse, of an eligible Indian who is not an Indian, or who is of Indian descent but is not otherwise eligible for the health services provided by the IHS, is eligible for such health services if the governing body of the Indian tribe or tribal organization providing such services deem them eligible by an appropriate resolution as a class. In addition, a non-Indian woman pregnant with an eligible Indian's child may receive IHS services for the duration of her pregnancy and through the postpartum period (usually six weeks after delivery) [184].

Programs and Initiatives

The services provided by the IHS for the AI/AN community are diverse. Diabetes prevention and the treatment of diabetes-associated complications are among the high priorities for the IHS [185]. They have developed diabetes surveillance systems to track diabetes prevalence and complications and an extensive network of professionals (including nurses) who are conducting diabetes treatment and prevention programs [185]. For the IHS, diabetes management and prevention are most critical because unmanaged diabetes can lead to increased morbidity and mortality.

The IHS has received special federal support to prevent and mitigate the diabetes epidemic in the AI/AN population. Following creation of the Special Diabetes Program for Indians in 1997, 302 communities in 35 states, serving more than 472,000 people per year, have implemented evidence-based best practices diabetes treatment and prevention programs [185]. The IHS has reported a significant improvement for AI/AN program participants, perhaps most importantly a 11% reduction in the average blood glucose levels for those with diagnosed diabetes between 1996 and 2022 [185].

The IHS Early Childhood Caries Collaborative provides AI/AN children with oral assessments and interventions to mitigate early childhood dental disease. It is designed to enhance knowledge about early childhood caries prevention and early intervention among not only dental providers, but also all healthcare providers and the community [186]. Similar to the collaborative approach used by public health programs outside the IHS, the IHS Early Childhood Caries Collaborative involves multiple stakeholders, including community health representatives, Head Start staff, and dental and medical staff and other programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). WIC is a social program for low-income women, infants, and children up to 5 years of age to provide healthy foods and referrals [187]. In order to promote dental health, the public and community health nurse assesses the oral health status of children during visits for childhood immunizations and screenings (e.g., vision, hearing, weight). According to the IHS, nurses can do oral health assessments on young children to look for chalky spots, black spots in grooves, and caries and provide positive oral health messages and education to parents on early childhood caries; they may also refer children to dental clinics [187].

The IHS also administers the Alcohol and Substance Abuse Program to decrease the incidence and prevalence of alcohol and substance abuse in AI/AN populations to a level that is at or below the general U.S. population [188]. This program provides access to behavioral health professionals through telemedicine (telebehavioral health), which acts to expand the reach of preventive, educational, and treatment services [188].

Another holistic model initiative is the Substance Abuse and Suicide Prevention (SASP) program (formerly the Methamphetamine and Suicide Prevention Initiative), a national, community-driven program that uses evidence-based practice and culturally appropriate prevention and treatment approaches [189]. From 2009 to 2015, the Methamphetamine and Suicide Prevention Initiative

resulted in more than 12,200 individuals entering treatment for methamphetamine abuse; more than 16,560 substance use and mental health disorder encounters via telehealth; more than 16,250 professionals and community members trained in suicide crisis response; and more than 690,590 encounters with youth provided as part of evidence-based and practice-based prevention activities.

The IHS also funds 13 Youth Regional Treatment Centers, which provide culturally sensitive education and prevention to youth experiencing substance abuse and co-existing disorders. The professional services are holistic, collaborative, and evidence-based [190]. These services include clinical evaluation; substance abuse education; group, individual, and family psychotherapy; art therapy; adventure-based counseling; life skills; medication management or monitoring; evidence-based/practice-based treatment; aftercare relapse prevention; and post-treatment follow-up services.

Because compromised AI/AN health is believed to be rooted in economic adversity and poor social conditions, having IHS and other players open access to care is not enough to improve the quality of life and promote public health for the AI/AN [179]. Access to services only accounts for part of the overall determinants of population health [136]. Population health is also affected by healthy lifestyle behaviors (e.g., nutrition, exercise), social conditions, economic factors, the physical environment (e.g., water and air quality), safe housing, law enforcement, and violence [136]. The belief that improvements in health services alone will mean improvements in overall health status is not reasonable. Improvements must take place in all areas that can contribute to a better quality of life, including educational achievement, employment opportunities, and economic development [191]. Access can be expanded through development of a robust community health workforce, utilizing traditional healing, providing telemedicine and telehealth services, and ensuring effectiveness in purchasing care outside the IHS [183]. Improving the health of the AI/AN population also relies on the effective delivery of comprehensive healthcare services that respect and honor tribal culture and practices [183]. The federal government, state and local health departments, and tribal health are an integrated system working together to protect the AI/AN population and promote initiatives to improve their well-being [5]. Each brings expertise for developing innovative strategies to benefit the AI/AN population. The idea of integrating systems together to service populations is of interest to others, and the IHS shares its public health approaches and best practices with other countries and their respective indigenous populations, including Canada, Mexico, Australia, and New Zealand [183; 191]. Mutual partnerships may also include non-government stakeholders, such as the business community.

The IHS Community Health Representative (CHR) Program is a tribally contracted, IHS-funded program established by Congress in 1968 in response to the needs of the AI/AN population. More than 95% of CHR programs are directly operated by tribes under the Indian Self-Determination and Education Assistance Act. More than 1,600 CHRs representing more than 250 tribes in all 12 IHS areas [192]. The CHR program provides guidance and support to a national tribal community health workforce identified as CHRs. CHRs work across AI/AN communities to improve access to health care and build community capacity [193]. The CHR Program collaborates with program partners on various IHS initiatives to support the Indian health system and its workforce. One initiative is a pilot project designed to test the applicability of a mini-cognitive assessment in community settings with the hope of raising awareness about dementia and Alzheimer disease [193].

The American Psychiatric Association recommends that the cultural formulation interview is very helpful in addressing issues specific to the Native populations and approaching the patients from where they are coming from.

(https://www.psychiatry.org/psychiatrists/diversity/education/best-practice-highlights/working-with-native-american-patients. Last accessed July 18, 2025.)

Level of Evidence: Expert Opinion/Consensus Statement

Public Health Workforce and the Indian Health Service

The IHS is staffed by approximately 15,000 employees that include civil servants, federal employees, and officers commissioned by the U.S. Public Health Services (USPHS). The USPHS includes individuals from many professional capacities, including physicians, nurses, dentists, behavioral health, clinical and rehabilitation therapists, and pharmacists [194].

Other Services for AI/AN Populations

The USDA is another public health resource supporting AI/AN populations. As discussed, the USDA's Rural Development program improves the quality of life of rural communities through community development and safety [195]. Through this program, Indian tribes are eligible for a variety of grants, direct loans, loan guarantees, and legal guidance pertaining to rural infrastructure issues, including rural rental housing, community facilities, business development, water and waste disposal, and broadband access. The targeting of these determinants in AI/AN communities is important, as economic adversity and impaired social conditions can compromise health.

Adequate sanitation facilities are lacking in approximately 41,000 AI/AN homes (or 11%). Of these homes, approximately 5,200 (or 1.4%) lack access to a safe water supply and/or waste disposal facilities, compared with less than 1% of homes for the U.S. general population [196]. Unregulated and unsafe water sources and poor waste disposal practices increase individuals' risk for infectious diseases (particularly waterborne disease). Lack of potable drinking water may also result in individuals relying on high-calorie drinks for hydration, which has been linked to overweight/obesity and diabetes.

The IHS Sanitation Facilities Construction Program is a preventative health program that yields positive benefits. A cost-benefit analysis indicated that for every dollar IHS spends on sanitation facilities to serve eligible existing homes, at least a 20-fold return in health benefits is achieved [197]. The IHS Sanitation Facilities Construction Program has been the primary provider of these services since 1960.

Telecommunication is a concern for AI/AN populations, and as noted, USDA assistance includes a broadband program and a community connect grant program. Communities in southwestern Alaska, for example, had no access to broadband services due to frontier factors—specifically remoteness, extreme weather, and terrain. The USDA Community Connect Program provides financial assistance in the form of grants to eligible applicants that will provide, on a "community-oriented connectivity" basis, broadband service that fosters economic growth and delivers enhanced educational, health care, and public safety benefits [198]. Federally recognized tribes are eligible to apply for grants. Since fiscal year 2013, more than $289 million in grants has been awarded, funding 130 grants and benefiting more than 136,000 rural residents [198].

A number of states have pipeline or pathway programs that recruit young students to participate in programs that introduce them to health careers and encourage or support them in pursuing those career paths. These programs often seek students from backgrounds historically under-represented in health care, such as AI/AN populations, to promote workforce diversity. Pipeline programs exist across the country, and legislation has supported these programs in states such as Arkansas and Virginia [199].

Case Example: Improving Tribal Dietary Health

The Navajo Nation in New Mexico is improving their dietary intake with help from partnerships. Healthy eating is a critical element to reducing disease risks, such as diabetes and cardiovascular disease, in all population groups. According to minority health experts, as compared with non-Hispanic White Americans, AI/AN adolescents are 30% more likely and AI/AN adults are 40% more likely to be obese [200]. Furthermore, AI/AN adults are 1.5 times more likely to be diagnosed with diabetes and 1.6 times more likely than non-Hispanic White Americans to die from diabetes [200]. Because obesity is a predisposing condition for diabetes and other chronic diseases, a healthy dietary intake is important. According to the CDC, of the AI/AN population, only 24% to 33% had a daily nutritional intake of five or more servings

of fruits and vegetables, with many not having the access to required daily nutrition due to a lack of grocery stores and/or a low income (as some healthier foods are more costly than less expensive alternatives) [201].

In partnership with a charity organization, a community outreach and empowerment project was carried out in the Navajo Nation in New Mexico. The Navajo Nation is considered the largest Indian reservation in the United States, geographically covering about 27,000 square miles and home to about 300,000 residents [202]. A variety of factors contribute to an increased risk for obesity among AI/AN populations, including:

- Replacement of the traditional diet (historically high in complex carbohydrates/high-fiber foods) with foods high in refined carbohydrates (e.g. refined sugars), fat, and sodium, and low in fruits and vegetables
- Unemployment and poverty
- Historical trauma and grief
- Differences in weight attitudes and ideas surrounding a healthy or attractive physique
- Depression
- Genetic predisposition
- Sedentary lifestyle

Through outreach, empowerment, and partnerships, fruits and vegetables were made more accessible to help Navajo families living in a food desert (defined as areas lacking food retailers and access to fresh and affordable foods) and needing dietary changes. As part of the outreach and empowerment program, free vouchers are given for produce and nutrition teaching. In response to the outreach empowerment program and increased demand for fruits and vegetables, local food markets expanded their produce selection. The project worked with healthcare providers across Navajo Nation and created the Fruit and Vegetable Prescription Program (FVRx). Through FVRx, physicians prescribe fruits and vegetables to families with pregnant women or young children. More than 1,700 people have benefited from FVRx food vouchers and education, and 85% of participants have met the goal of eating five servings of fruits and vegetables per day. After just six months in the program, nearly one-third of children who were initially overweight met the criteria for healthy weight [202]. There is also a plan for community health teams consisting of clinics, clinicians, and community health workers to expand the healthy eating initiative across the Navajo Nation [203]. Navajo youth are also taking ownership to better nutrition across the reservation. Trained students from five high schools are teaching across the reservation about nutrition-related illnesses [204].

SERVICES FOR ELDERLY PATIENTS

The U.S. population is aging at an unprecedented rate. Two factors—longer life spans and aging "baby boomers"—will continue to increase the aging population from approximately 58 million in 2021, to 88.8 million in 2060 [205; 206]. By 2040, it is estimated that older adults will account for greater than 22% of the U.S. population [205]. The public health workforce will be increasingly interfacing with the aging population in their daily work, influencing the health and well-being of U.S. seniors.

Historically, responsibility for caring for the elderly largely fell to family, friends, neighbors, and churches (the "informal sector"). Government and private intervention were considered a secondary source of service when the primary option—the informal sector—was insufficient or fragmented. Before the 20th century, poor houses for those without any provision of help grew in number, attempting to service the vulnerable, but access was not equitable. In response, the Social Security Act of 1935 was passed and prompted the development of a more structured safety net for housing to replace the poor house. Incrementally, the social service system for the elderly developed. In 1952, for example, Congress funded social service programs for seniors. Later, the Older Americans Act of 1965 was enacted, assigning responsibility for elder care to all levels of

government and aiming to preserve the dignity of elderly Americans with more comprehensive services, including community services [207]. The Act developed the national aging network, made up of many units that are partnered in an effort to service seniors. This network includes the Administration on Aging, state units on aging, and local agencies on aging. The "aging network" is also a resource to meals for older adults in need, and when the network provides meals, it can be an opportunity to provide other services, including falls prevention programs, chronic disease self-management programs, and transportation [208].

The Administration on Aging is considered a major venue for senior services, although other federal programs are also important. In fact, Medicare, VA, and IHS provide much of the financing for health care for elderly in this country [209]. The Administration on Aging authorizes an array of programs through a national network of 56 state agencies on aging, 618 area agencies on aging, nearly 20,000 service providers, 281 tribal organizations, and 1 native Hawaiian organization representing 400 tribes [209]. Community services supported by the Administration on Aging include programs related to elder abuse, nutrition, health promotion, transportation to care, information assistance, and caregiver support [210]. The local area agencies on aging provide social services for elders and are generally administered through state offices of elder services. Low-income seniors requiring assistance with activities of living (e.g., feeding, bathing, grocery shopping, bill paying) greatly rely on state programs [211].

Medicaid is a federal-state joint public program providing health services to children, pregnant women, parents, seniors, and disabled persons, and it is considered the largest U.S. healthcare insurance provider [212]. It is administered by the states, and states have a good amount of discretion on the Medicaid program they provide, resulting in interstate variation in programs. Skilled long-term care that is largely used by disabled seniors is covered under Medicaid, and this coverage was expanded by the 2010 Affordable Care Act, giving consumers the choice of traditional care at a long-term care facility or receiving services in a community-based setting, including home. Although the federal law has authorized community-based services, not all states and their locales offer this option, instead limiting covered care to state-run nursing homes for long-term care [212]. According to the National Conference of State Legislatures, "rural seniors with unmet personal and healthcare needs may be prematurely forced into assisted living or nursing homes because they are unable to live independently in their own home or community. The shift to institutionalization not only restricts consumer choice and satisfaction, but it is a major cost driver for state Medicaid programs" [144]. In rural communities, there are fewer support services for elderly patients and fewer options for long-term care services. Rural health clinics certified to give home health services are an option when there is no home health agency in the area. These clinics can supply visiting nurse services to home-bound patients in areas with shortages of certified home health agencies [213].

Promoting Health in Old Age Through Public Health Services

Public health services, particularly preventive health services (e.g., screenings for chronic disease, immunization programs, health counseling services) are important for maintaining the quality of life and wellness of older adults [214]. However, rural seniors are often disadvantaged in regard to social services and health care due to lack of financial resources in rural areas [211]. Rural residents may find it difficult to access healthy food, with some rural households or residents considered "food insecure," which is defined as having limited access to sufficient, nutritious, and affordable foods. Food insecurity has been associated with chronic disease and poor health, and in the long term, it can affect learning, development, productivity, physical and mental health, and family life [215]. The USDA reports food insecurity rates for rural areas to be 13.5% in 2023 [215]. The factors underlying community-level food security

issues are complex and include social, economic, and institutional factors. Households with limited resources use a variety of methods to help meet their food needs. Some participate in federal food and nutrition assistance programs or obtain food from emergency providers in their communities to supplement the food they purchase [216]. There are food assistance programs specifically available for elderly persons living in rural areas. Nutrition services made available by the Older Americans Act include the Congregate Nutrition Program and the Home-Delivered Nutrition Program, which provide healthy meals in group settings, such as senior centers and faith-based locations, as well as in the homes of older adults who live alone [216]. The USDA administers the Senior Farmers' Market Nutrition Program, which awards grants to states, territories, and federally recognized Indian tribal governments to provide low-income seniors with coupons that can be exchanged for eligible foods (i.e., fruits, vegetables, honey, and fresh-cut herbs) at farmers' markets, roadside stands, and community supported agriculture programs. The goal of this program is to provide better access to fresh foods to older adults with poor access to a healthy diet. More information on government nutrition programs for older individuals is available online at https://www.nutrition.gov.

According to the CDC, there are many benefits to physical activity for the older adult, such as decreasing the risk of falls, fractures, coronary artery disease, diabetes, hypertension, stroke, and colon cancer and improving mental and emotional health, skeletomuscular health, and some symptoms of arthritis (e.g., joint swelling). Even a moderate amount of daily physical activity can lead to significant health benefits. It is recommended that older adults first have a consultation with their physician or primary care provider before starting a new physical activity program. Higher levels of physical activity can carry a greater risk for injury, and therefore caution should be taken not to engage in excessive amounts of activity. Communities can offer programs for aerobic, strengthening, and flexibility components specifically designed for older adults [217]. Walking is often a preferred approach, but rural communities tend to lack sidewalks, trails, and parks. Schools and community centers may provide a venue for exercise programs, but not all older adults can reach these locations due to geographic isolation and lack of transportation.

Alzheimer Disease: A Public Health Concern

According to the CDC, Alzheimer disease and other dementias are public health concerns, compromising the health and quality of life for many U.S. adults [218]. Alzheimer disease slowly destroys brain function, leading to cognitive decline (e.g., memory loss, language difficulty, poor executive function), behavioral and psychiatric disorders (e.g., depression, delusions, agitation), and declines in functional status (e.g., ability to engage in activities of daily living and self-care). Alzheimer disease not only impacts the quality of life of the individual with the diagnosis but may impact the health of caregivers who assume responsibility to provide care [219].

Alzheimer disease is the most costly chronic medical condition in the United States, with direct medical costs of nearly $290 billion—more than the costs of care for patients with heart disease and stroke [220]. Projections show the number of people with Alzheimer disease and other dementias is growing. The number of people living with Alzheimer disease is projected to double from 6.9 million in 2020 to nearly 14 million by 2060 [221]. More than 95% of people with dementia have one or more other chronic conditions and are expected to have a functional decline in the future.

By 2035, more than two-thirds of the population will likely need some level of caregiving during their lifetime [218]. While unpaid caregiving can reduce the need for paid services from many sectors, it is a public health concern because it often leads to physical, emotional, psychological, and financial strain

for caregivers. All this can be especially difficult for rural caregivers who may already be burdened by isolation and financial limitations [218]. Family members or friends often become caregivers for adults with Alzheimer disease and related dementias. As of 2023, more than 11 million U.S. adults were providing unpaid care for someone with a form of dementia. Nearly 1 in 3 provides care for four years or more. Most (about two-thirds) of caregivers are women, and 1 in 3 are 65 years of age or older [222]. Caregivers of people with Alzheimer disease are at greater risk for anxiety, depression, and a poorer quality of life than other caregivers [222]. Caregiver intervention has been shown to reduce nursing home placement of people with Alzheimer disease by 28% and to delay institutionalization by 557 days [220].

The public health response to Alzheimer disease requires a life-course approach that focuses on reducing risk and identifying memory issues earlier to improve health outcomes. Public health agencies can help build a strong public health infrastructure by advancing proven strategies that support and help to maintain the health, well-being, and productivity of caregivers [223]. Many federal, state, and local programs and initiatives, as well as individual practitioners, are addressing the public health concern of Alzheimer disease [223; 224; 225; 226]. The National Prevention Strategy recommends educating professionals to assess, identify, and address disparities that could be exacerbated with age [210]. Factors that have potential to exacerbate health disparities experienced by older adults in rural areas include physical disability, isolated living with few contacts, and limited or insufficient retirement income. The Council also suggests shifting from the traditional, reactive personal health and wellness approach to a more modern, proactive approach that emphasizes prevention [210]. To support healthy aging, a collaborative effort should be employed across the disciplines and professions to work together on this approach [210].

IMPROVING THE RURAL PUBLIC HEALTHCARE SYSTEM

HEALTH PROMOTION AND DISEASE PREVENTION

Health promotion and disease prevention are important objectives for the U.S. public health system. As discussed, there are many key players working in partnership to improve the system. Among them is the CDC, which maintains several campaigns for healthier lives, including those focused on smoke-free environments, healthy daily nutrition, physical activity, and health-friendly communities [227]. The CDC promotes a cross-cutting intervention and multi-stakeholder collaboration approach that can be used to mitigate chronic conditions and related risk factors. The CDC offers four areas of intervention for offsetting chronic disease and promoting population health [228]:

- Epidemiology and surveillance
- Environmental approaches
- Healthcare system interventions
- Linking community-level programs to clinical services

Epidemiology and Surveillance

Epidemiology and surveillance are key in promoting population health [228]. Epidemiology is the basic science of public health, defined as the study of the distribution and determinants of health-related states or events in specified populations and the application of this study to the control of health problems [228]. These health-related states or events can be anything that affects the well-being of a population. Determinants are the factors influencing (or associated with) disease occurrence and health-related events [229].

The CDC defines surveillance as the process of continuously monitoring attitudes, behaviors, and health outcomes over time [230]. The health promotion and disease prevention activities of public health agencies rely on data collected through public health screening and treatment services, as well as from laboratories, pharmacies, environmental health monitors, EMS, local public health agencies, and clinical care providers. There are many types of data registries, including ones related to cancer, childhood immunizations, birth defects, autism, asthma, diabetes, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), blood lead levels, sexually transmitted infections, chronic disease, and traumatic injuries. There are also case reporting systems for monitoring disease outbreaks and trends. There is variation across public health agencies' information systems [231].

Data are systematically gathered, and the CDC has developed data indicators of chronic disease and associated risk factors that impact public health. These indicators enable public health professionals and policymakers to retrieve uniformly defined state-level and selected metropolitan-level data for chronic diseases and risk factors that have a substantial impact on public health. These data are essential for surveillance, setting policy priorities, and analysis of public policy programs [232].

Public programs educate and guide communities toward healthy behaviors, and providing these programs requires accountability. Some of this accountability is represented through evaluation of data during and following program implementation to determine impact and social value and to show the community that providers are accountable for their public health actions. Surveillance data are also used for public agency budget-setting and strategic planning for the future [76]. Some public health nurses routinely conduct surveillance as part of their practice.

One example of a public health surveillance system is the Foodborne Disease Outbreak Surveillance System, which collects data related to foodborne disease outbreaks [233]. In this registry, data are collected to give insight into the cause, the context, and the underlying conditions of the outbreak. Tracking and analysis are ongoing objective efforts intended to inform targeted prevention efforts. This system guides state and local health departments to investigate and report outbreaks through the identification of foods, etiologies, outbreak settings, and specific points of contamination [233]. Analyzed surveillance data are disseminated through different means to stakeholders.

Another example of a public health surveillance system is the BRFSS, a telephone survey of adults 18 years and older conducted by the CDC and state and local public health departments. The BRFSS is considered as the largest continuous telephone health surveillance system in the world, with more than 400,000 adults 18 years of age and older interviewed annually [234]. The system collects data about health risk behaviors, chronic health conditions, and the use of preventive services among U.S. residents. In turn, it provides information to the federal government, states, and local communities for planning, implementing, and evaluating public health programs and actions [234]. States have used BRFSS surveillance data to monitor trends in physical activity, prevalence of obesity, risk factors related to chronic disease, vaccination rates, and prevalence of arthritis. They then prepare grant applications and public health reports, create plans, and evaluate program interventions. For information on how BRFSS data are used in your state, visit https://www.cdc.gov/brfss/state_info.

The CDC disseminates surveillance summaries and interpretation of public health trends and patterns in the Morbidity and Mortality Weekly Report (MMWR), available to read online at https://www.cdc.gov/mmwr/publications.

Environmental Approaches

Approaches and action to improve environmental health are considered to be more effective than other types of population health interventions, partially because policies tend to have broader implications than other interventions. The stakeholders—policy leaders, private-sector employers, community planning committees, economic development agencies, and grassroots organizations—are involved in developing and implementing these actions [235]. Government leadership is largely involved in the creation and funding of policy/environmental interventions. Funding is critical to public health policy and programs, and historically, wealthier states and locales have been more likely to legislatively adopt innovative policies.

Community interventions based on policy/environment actions can positively impact population health. Several case examples demonstrate the effectiveness of environmental initiatives against obesity. The South Dakota Department of Health, for example, partnered with a coalition of statewide organizations to provide wellness programs at different South Dakota workplaces/employers [236]. Employers establish wellness programs and other incentives to encourage employees to get physically active, such as setting up bike racks to encourage employees to bike to and from work and making work schedule changes that would permit physical activity during paid time. These employer interventions have received positive feedback from the community [236]. Worksite evaluation studies have showed that these types of interventions resulted in an increase in the amount of time spent engaged in moderate aerobic physical activity among workers [236].

In Wisconsin, the state has authorized grants to businesses for the development of worksite wellness programs to include health risk assessments [237]. In Montana, the Department of Public Health and Human Services is teaching community stakeholders to build a healthier environment for residents through designing streets, sidewalks, bike lanes, parks, and trails that help people be more physically active [238]. Participating counties have received awards for their "Complete Streets Policy."

Utah is also involved in policy/environment actions to fight chronic illness and risk factors. Here, multiple stakeholders (including the Utah Department of Transportation, the Utah Department of Health, local health departments, and city planners) have collaboratively formulated transportation policies for Utah residents that provide more physical activity options in the community, such as safe and sustainable walking trails and bike lanes [239]. This is important because residents in rural and low-income areas typically do not have walking trails or bike lanes that support safe, interconnected spaces for people to be physically active [239].

State and local communities have also developed policy/environment actions targeting the need for a healthy daily diet. Healthy nutrition is important for mitigating disease, and the literature overwhelmingly supports the increased intake of fruits and vegetables. Despite health benefits, research shows that far less than the recommended number of fruits and vegetables are being consumed as part of the typical American diet [240]. One reason is inaccessibility and the high cost of fresh, nutritious food, an even greater issue for low-income communities or families. Although the government is already implementing policies to facilitate better access to healthy foods (e.g., through the WIC federal assistance program), states and communities can do more to improve accessibility [240]. For example, policy actions can strengthen the regional food systems for both consumers and producers. According to the CDC, 32 states have an active state food policy council, and there are 234 local food policy councils in the United States. Ten states have adopted a policy

on food service guidelines that ensures healthy food options be sold or served in government-owned or -controlled facilities [240]. In addition, about 42% of school districts participate in farm-to-food programs and provide salad bars. Outside schools and government workplaces, farmers' markets have begun to accept WIC and vouchers from the Farmers' Market Nutrition Program [240]. Typically, a combination of policies and environmental interventions is used in order to meet the needs of rural residents.

Healthcare System Interventions

Healthcare system interventions to improve clinical preventive services are necessary in order to more effectively deliver clinical and other services to prevent, detect early, and mitigate diseases in all populations, including those in rural communities [228]. System enhancements can have effect on the organization, the people engaged in the healthcare system, the population being served, and other parties (e.g., insurance carriers). Telehealth and electronic health records are examples of initiatives aimed at enhancing the health system. Federal laws have been enacted largely supporting health technology and more are being passed on the state level, laying a legal foundation to make technology in healthcare work better.

Electronic medical records are real-time, patient-centered records that make information available instantly and securely to authorized users, allowing patient records to be electronically coordinated among various providers [241]. A coordinated system is critical, because coordinated actions by public health and healthcare professionals, communities, and healthcare systems can and will keep people healthy, optimize care, and improve outcomes within priority populations [227]. This healthcare system enhancement is still evolving. Although many care systems report enhanced operations by way of electronic medical records, some sources acknowledge that organizational preparation is critical before implementing a new system. Lack of facility preparation or personnel training on electronic medical records may lead to issues. This technology allows providers to share patient data in a centralized location readily accessible to the entire interprofessional care team. A single electronic record can bring together information from current and past providers, emergency facilities, school and workplace clinics, pharmacies, laboratories, and medical imaging facilities [242]. Some states (e.g., Nebraska, New Mexico) have established statewide telehealth and health information technology systems to better meet the needs of rural and medically underserved areas, promoting efficient and effective care, better quality, and increased access to services [243].

Another example of the use of technology to support the interprofessional healthcare team is the growing use of prescription drug monitoring databases. Prescription drug monitoring programs are one of the most effective measures for reducing opioid analgesic diversion and abuse and are a cornerstone of state efforts to address the opioid crisis. Almost all states have enacted these programs to facilitate the collection, analysis, and reporting of information on controlled substances prescribing and dispensing.

Technology can also enhance surveillance operations, making them more efficient and potentially keeping data safer and enabling efficient data sharing. Health information technology has the potential to link activities between information/data "trading partners," such as health insurance providers, inpatient and outpatient providers, state and local governments, and federal organizations. Technology brings together partners for many reasons, including program planning, direct care, administration, and surveillance sharing. There has been federal support for health information exchange organizations, which are believed to have the potential to enhance the healthcare system by promoting efficiency in connections across jurisdictions. Although federal funding is available, there are factors that may limit (or temporarily limit) public health's use of these initiatives, including lack of trained public health informatics resources; the complexity of local, state, and federal laws; a dearth of leadership and champions to advance integration; and competing priorities [231]. In all, technology is improving connectivity within, among, and across rural public and non-public health systems.

Linking Community Programs and Clinical Services

Linking together community programs and clinical services promises to improve and sustain management of chronic conditions, as it can open up a pool of resources among providers and broaden the scope of community care. When these two entities work closely together, integrated approaches that bundle strategies and interventions may be effectively deployed [228].

Some areas or groups use community outreach programs to bring together prevention programs and clinical services. For example, health and wellness fairs have been used to introduce the public to prevention principles and to clinicians under the same tent; this may involve hosting on-site screening services (e.g., hypertension and/or lipid screening, bone density tests, hearing and vision screenings, nutrition assessments), physical fitness programs, and/or farmers' markets for healthy eating habits. These community health fairs integrate public health principles of prevention and screening with local primary care clinical services. The theory is that population health (not just individual outcomes) may be improved through the use of community partnerships and collaboration with stakeholders [228].

Citizen engagement can also be used to bring together community programs and clinical services. In Alabama, more than one-half of patients of federally qualified health centers were visiting the centers for priority conditions, such as diabetes or hypertension, but were not being screened for cancer. The state's public health cancer division worked with the health centers to design a screening information card, designed to start conversions about cancer screening, that could be given to patients while waiting to see their physicians. As a result of the cards and other changes, the percentage of age-eligible patients screened for colorectal cancer increased from 9% to 22% across the health centers surveyed in one year [244]. A health center in Chicago trained medical assistants on colorectal cancer and how to educate patients. They also sent text messages to patients reminding them to get screened and to return their stool test kits. Over four years, screening increased from 27% to 49% [244]. In the Appalachian region of Kentucky, Grace Health, in collaboration with a state screening program, distributed simple one-sample stool test kits (instead of the three-sample kits) to determine if this would increase completion of colon cancer screening. Grace Health also changed from quarterly to monthly provider assessment and feedback. After making these changes, nearly two-thirds of patients completed screening and the overall screening rate increased from 10% in 2017 to 45% in 2019 [244].

A Multi-Intervention Approach: The Healthy Brain Initiative

It is common for decision-makers to employ a multi-intervention approach in rural public health, given the unique rural context and many disparities of rural populations (e.g., economically disadvantaged, insufficient food sources, barriers to broadband connectivity). One example illustrating a multi-intervention and proactive approach to a public health issue is the CDC's initiative addressing the challenge of dementia.

As discussed, dementias are a serious public health concern, affecting 6.9 million Americans and resulting in $290 billion in annual costs [221]. By 2060, these numbers are expected to increase significantly, to 14 million Americans and $1.1 trillion annually. To promote brain health, improve servicing to populations with cognitive decline, and provide support to dementia caregivers, the CDC developed the Healthy Brain Initiative. The Healthy Brain Initiative aims to stimulate changes in policies, systems, and environments and consists of a roadmap of 25 actions for years 2018–2023 to be accomplished by state and local public health agencies and partners [245].

The Healthy Brain Initiative supports informed decision-making by educating policy-makers on the basics of cognitive health and impairment, the impact of dementia on caregivers and communities, and the role of public health in addressing this priority problem. The Healthy Brain Initiative is informed by four essential services of public health [245]:

- Assure a competent workforce
- Educate and empower the nation
- Monitor and evaluate
- Develop policies and mobilize partnerships

Unfortunately, the healthcare workforce appears under-equipped to meet the growing demand for high-quality dementia care in the coming years. As of 2015, only two states required training in dementia for RNs and/or LPNs/LVNs, and only 23 states required dementia training for staff of nursing homes. The majority of states with a mandate only require training for personnel in Alzheimer disease special care units. Less than 3% of medical students choose geriatric electives during their training, which means that most will enter the workforce with little exposure to the needs of older adults [245].

The Healthy Brain Initiative encourages training the healthcare workforce so it is intellectually prepared to provide cognitive impairment and dementia care [245]. To be professionally prepared for dementia care, healthcare professionals should have education on the importance of treating comorbidities, addressing injury risks, and attending to behavioral health needs of patients at all stages of dementia. Caregivers should be given referrals to supportive programs and services and encouraged to make use of available resources. Public health professionals are to have reliable sources of information on brain health and evidence-based dementia education [245].

Educating the community is another key aspect of the Healthy Brain Initiative. Public information campaigns focus on brain health and cognitive decline. Informal caregivers should be given appropriate tools and support for aiding those with dementia. When required, professionals should offer counseling and referrals to dementia caregivers and assist them in gaining access to evidence-based interventions and services. The Initiative encourages environmental policies that engage the workplace and community to support the needs of the aging population. For example, emergency response/preparedness planning should be aligned with dementia care needs and home caregivers needs (e.g., the caregiver having immediate access to critical public health information) [245].

Monitoring and evaluating the growing dementia care issue is aligned with the chronic disease epidemiology and surveillance intervention [228]. The Healthy Brain Initiative emphasizes national monitoring and evaluation of training programs, caregiver support programs, and brain health policy initiative outcomes. To implement dementia surveillance, the BRFSS includes modules measuring level of cognitive capacity for those with dementia and caregiving [245]. More information on the conceptual framework for the Healthy Brain Initiative and its 24 action items for public health professionals can be found online at https://www.cdc.gov/aging-programs/media/pdfs/2024/06/HBI-State-and-Local-Road-Map-for-Public-Health-2023-2027-508-compliant.pdf. Resources for state and local healthcare professionals are also available [224].

IMPROVING ACCESS TO COMMUNITY SERVICES

Rural access to public programs and other services is lacking. Many states have initiatives in place to improve access, including programs to improve the healthcare infrastructure, decrease provider shortages, build up professional workforce competencies, and take advantage of technology (e.g., the Internet).

The solution to the problem of access in rural communities requires a comprehensive and collaborative approach with many stakeholders. Despite efforts to date, rural populations still lag behind urban populations in access to needed healthcare and social services. According to the National Prevention Strategy, residents of rural areas are more likely to have a number of chronic conditions and less likely to receive recommended preventive services because of the lack of access to care providers and patient care sites [104].

In order to promote wellness and prevent disease in rural communities, the National Prevention Strategy established the following priorities [104]:

- Support initiatives to increase the availability of healthy and affordable foods in underserved rural and frontier communities.
- Pilot and evaluate models of integrated mental and physical health in primary care, with particular attention to underserved populations and areas, such as rural communities.
- Support local efforts that promote active living by supporting efficient transportation networks that connect people in rural communities to parks and other outdoor recreation venues.
- Improve access to high-quality mental health services and facilitate integration of mental health services into a range of clinical and community settings.

A key government agency working toward eliminating disparities and improving access to care is the Health Resources and Services Administration. This is the primary federal agency responsible for improving health care for people who are geographically isolated and/or economically or medically vulnerable [246]. In an effort to strengthen the healthcare workforce, the Health Resources and Services Administration is aiming to advance professional competencies of health workers and to improve the diversity of the workforce, which will improve the ability of providers to meet the needs of underserved populations and correct the maldistribution of the workforce [247].

In addition to the National Prevention Strategy, the Health Resources and Services Administration, and the 2010 Affordable Care Act, states are also taking action to reduce disparities in care access in rural communities. Some states have passed legislation aimed to eliminate disparities in healthcare access in rural communities, though they have taken different approaches to address this problem [135; 243]. For example, laws in Arkansas and Delaware encourage public higher education institutions to give special consideration to recruit students from medically underserved areas interested in health-related careers [243]. Kansas established the Advanced Registered Nurse Practitioner Service Scholarship Program for students who agree to practice nursing in a medically underserved or rural area in their state upon finishing a program of study as an advanced registered nurse practitioner [243].

The World Health Organization recommends using targeted admission policies to enroll students with a rural background in education programs for various health disciplines, in order to increase the likelihood of graduates choosing to practice in rural areas.

(https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf. Last accessed July 18, 2025.)

Strength of Recommendation/Level of Evidence: Strong/Moderate

Loan forgiveness and loan repayment programs have also been instituted by states in an effort to improve the distribution of healthcare professionals in urban areas. In Alabama, the Advanced Practice Loan Repayment program awards loans to RNs who are pursuing an advanced practice degree. This program provides students with $15,000 toward their education in exchange for an 18-month commitment to work in a geographical area of critical need (defined as at least 5 miles outside of an "urbanized area") following graduation [248]. Oregon and Rhode Island have established programs to provide loan repayments on behalf of designated healthcare practitioners who agree to practice in qualifying practice sites [243]. The West Virginia State Loan Repay-

ment Program awards nurse practitioners and nurse midwives up to $90,000 in loan forgiveness for four years' commitment working in a health professional shortage area [249]. Such state initiatives promise to increase the density of nurses in rural areas. These same approaches have been applied to other professions, including physicians, dental professionals, and mental health providers, in order to improve access to care in underserved areas.

Use of Technology in Public Health

The possibility for advanced technology to improve population health is growing. As discussed, advanced technology (e.g., Internet, satellite, mobile technology) may be used in rural communities to improve access to and quality of care, to improve health outcomes, and to minimize costs. Despite its promise in meeting healthcare needs in underserved rural areas, research on the topic is mixed. Upon systematic review of a large body of research literature, the Agency for Healthcare Research and Quality concluded there is sufficient evidence to support the effectiveness of telehealth for specific uses with some types of patients, including remote patient monitoring for patients with chronic conditions; communication and counseling for patients with chronic conditions; and psychotherapy as part of behavioral health [250]. Other evaluative studies, including one conducted by the VA on their rural telehealth initiatives, report numerous favorable outcomes associated with telehealth actions [137]. However, some still express doubt as to the real value of telehealth's ability to replace traditional care services [137].

Telehealth

Telehealth approaches can create a network linking rural providers to nonrural providers and agencies and the rural population to online providers and programs, ultimately improving access for populations who are living in rural areas who tend to have higher chronic disease and mortality rates [137]. Federal telehealth pioneers include the U.S. Department of Defense, the VA, National Air and Space Administration, and Medicare.

Telehealth innovation requires a positive legal environment, advocacy, and funding. Federal agencies such as the FDA play a large role in the regulation of safe technology use in health, and the federal government has been a primary funding source for agencies interested in piloting telehealth programs for rural residents [251]. Aside from funding, the federal government has enacted legislation making the Internet and broadband more accessible to rural areas. Many states have passed laws enabling care providers to participate in telehealth and regulating the practice. In particular, Texas and California have been historical innovators in telehealth, using telephone and video technologies to improve access to care for prison inmates in remote correctional facilities [138]. Telehealth practitioner reimbursement and tele-licensure laws have been critical in allowing telehealth to progress. Health interest groups also play a significant role in influencing the adoption and implementation of telehealth practices, as does nurse advocacy. In one study of telehealth implementation, nurse and physician policy networks were found to influence the extent of telehealth program implementation across the entire nation [138].

The Department of Health and Human Services' Office for the Advancement of Telehealth provides funding and administers a variety of programs focused on technical assistance, research, direct services, and workforce. There are two programs that focus on policy and technology and 12 regional programs that host activities and provide resources to rural and underserved areas. There are two research centers that inform advances in healthcare access and population health for rural areas. One of the direct services programs uses telehealth and telehealth networks in rural and underserved areas to improve access to behavioral health services and improve the quality of health information available to healthcare providers. A program focused on workforce is designed to improve retention of healthcare providers and increase access to healthcare services in rural, frontier, and health professional shortage areas or medically underserved areas and populations [252].

There have been a number of definitions for telehealth, varying across organizations and healthcare work cultures. The American Telemedicine Association defines telehealth as [253]:

> ...a mode of delivering healthcare services through the use of telecommunications technologies, including but not limited to asynchronous and synchronous technology, and remote patient monitoring technology, by a healthcare practitioner to a patient or a practitioner at a different physical location than the healthcare practitioner.

U.S. Congress defines telehealth as the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health, and health administration [254]. Internet-based health care is a form of telehealth, also referred to as "e-health." E-health may also be used to describe any health-related online activity (e.g., searching for wellness information online) or, in some contexts, to cover other technology use in health care.

The original goal for telehealth was to improve consumer access to healthcare professionals for persons living in federally designated professional shortage areas and the other underserved areas [138]. Most rural states have historically used telehealth for this purpose.

EVIDENCE-BASED PRACTICE RECOMMENDATION

The World Health Organization recommends that appropriate outreach activities should be implemented to facilitate cooperation between health workers from better served areas and those in underserved areas, and, where feasible, use telehealth to provide additional support to health workers in remote and rural areas.

(https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf. Last accessed July 18, 2025.)

Strength of Recommendation/Level of Evidence: Strong/Low

The COVID-19 public health emergency and the resulting increase in telehealth utilization, has sparked initiatives to further expand and maintain accessibility to telehealth services. Insurance coverage of telehealth services derived from COVID-19 was set to expire following the end of the emergency. However, policymakers extended both payment parity and coverage of services. Through the Consolidated Appropriations Act, both federally qualified health centers and rural health centers can now permanently provide mental and behavioral telehealth services [255].

One challenge with telehealth is interstate licensure. The number of patients who sought care from out-of-state physicians increased exponentially following the COVID-19 pandemic. During that time, all states and the District of Columbia passed licensing waivers that allowed providers to see patients outside their state. At the end of the COVID-19 pandemic, some states discontinued their licensing waivers. While telehealth interstate licensure is often debated, the increased usage of telehealth and ease in accessing care for those who live on or near state lines may help lessen the burden for providers in rural areas [255; 256; 257].

As mentioned, an additional challenge to telehealth is connectivity. According to the Federal Communications Commission, about 24 million households in rural areas in the United States lack access to broadband service. This "digital divide" limits the utilization of telehealth services across the country. In 2021, only 29% of people in rural areas had an appointment with a doctor, nurse, or other health professional by video or phone in the last 12 months, compared with 40% of people in urban areas. Additionally, beyond lack of physical access to the necessary technology (e.g., computer/smart phone/tablet, internet access), digital literacy remains a major barrier for underserved populations, including rural households with lower education levels [258; 259; 260; 261].

Rural communities are using telehealth to increase access to pharmacy services. Referred to as "telepharmacy," this model helps rural communities overcome some common challenges to pharmacy practice, including financial difficulties related to low patient volume and a limited ability to recruit qualified pharmacists. A study of telepharmacy use in the rural Midwest found no differences in the quality of medication use between telepharmacies and traditional pharmacies [262; 263]. Several examples of rural telepharmacy models exist. For example, the North Dakota Telepharmacy Project provides pharmacy services to rural and frontier communities across the state. This project allows pharmacy technicians to prepare a prescription and then videoconference with a pharmacist to obtain approval to dispense the medication. After receiving counseling from the pharmacist through videoconferencing, the patient is then able to receive their prescription. More than 80,000 rural residents of North Dakota have been served by this model [262].

Internet and Social Media

An early form of Internet use in public health was information sharing or using technology to disseminate health information to the general public. Agencies place information on their websites to educate the public on outbreaks, preventive medicine recommendations, health plans, providers, and health insurance [264]. The CDC uses their website, social media accounts, and listservs to disseminate information to providers and the public, including information on disease outbreaks and pandemics, food recalls, travel health, and health statistics. The Internet can make tracking disease, gathering data, and administrative decisions on population health issues more efficient and reliable. It has the potential to enhance the detection of disease outbreaks by enabling the efficient sharing of surveillance data. In a public emergency, effectively sharing data may influence a better response for outbreak coordination and management [265].

Educating communities is an important component of public health nursing, and the Internet is a health-education medium that can be used to empower patients with knowledge, expose them to information covering a spectrum of health and wellness programs, and link them with providers and services [266]. For example, the Nevada Youth Anti-Vaping Campaign was launched in 2020 to prevent initiation of tobacco use (including emerging products and e-cigarettes) among youth and young adults. This statewide campaign has developed best-practice and evidence-based media messaging to decrease youth initiation and use of e-cigarettes [266]. Researchers interviewed more than 320 teens in northern, rural, and southern Nevada to assess attitudes to messages on vaping prevention and preferences to ad style, tone, characters, settings, and framing. The data gathered from these interviews led to two campaign strategies, one targeting teens and one targeting parents and other adult influencers. The teen-focused campaign "Behind the Haze" uses YouTube to deliver educational content about vapes in a relevant and relatable way aimed at increasing perception of risk and curbing social appeal of vape use [266]. Campaign messages also are available on Snapchat, Instagram, and online at https://www.behindthehazenv.com.

Barriers to Internet Use in Rural Areas

Because the Internet has become so important for connecting professionals and transmitting health information, broadband access has become vital. Broadband is particularly important for rural healthcare providers interested in meaningfully using electronic health records, as many of the capabilities of health information technology, such as telehealth and electronic exchange of healthcare information, require broadband capability; access to and use of quality broadband connectivity became increasingly necessary during the COVID-19 pandemic and required lockdown measures [13]. Broadband connectivity has made great strides in recent years, and county-level data indicate that rural household connectivity continues to improve and expand geographically [137]. In 2019, 72% of rural residents and 63% of rural residents in persistent poverty

counties had moderate- or high-speed broadband available [13]. Rural counties with higher-than-average connectivity are primarily located in the Northeast, upper Midwest, and Intermountain West; extensive parts of rural Appalachia also saw improvements [13]. Although more rural households are getting connected with broadband, other barriers still exist, including not having the skills to navigate the Internet. Public libraries often have programs to teach computer skills to residents or to help residents access Internet technology. However, public libraries are not as accessible in geographically remote areas. Rural schools may be an alternative option for computer skills training in rural communities, if funded.

BUILDING WORKFORCE CAPACITY

As stated, the U.S. rural health professional workforce is characterized by maldistribution and shortages, particularly in areas of primary care, mental health, and dental services and in specific health subspecialties and it faces several challenges in the coming years [138]. Barriers to healthcare access and shortages of providers result in uneven use of services. Because the primary care workforce is not distributed equally among geographic areas, many rural areas face low rates of physicians and other practitioners. Lower compensation compared to nonprimary care specialties and heightened stress and burnout (especially in the aftermath of COVID-19) are challenges in attracting and retaining new clinicians [156].

Burnout has increased in many healthcare occupations. Among primary care physicians, more than one-half reported feeling burnout in 2022 [156]. A 2025 survey of 2,600 individuals across the nursing profession found that 65% of nurses report high levels of stress and burnout due to inadequate staffing and pay, lack of leadership support, and patient abuse. Only 60% of nurses surveyed say they would choose nursing again if given the choice [267]. According to the Substance Abuse and Mental Health Services Administration, more than 50% of behavioral health providers report experiencing symptoms of burnout [268]. Results from a 2022 survey of 665 health system pharmacists found that 64% report feeling burned out [269].

Healthcare facilities can employ various strategies (e.g., technology, telehealth, interprofessional care teams) to mitigate healthcare workforce shortages and burnout and improve care. Allowing professionals to work at the top of their license and skill set can also lessen the effects of shortages. To address recruitment and retention difficulties, administrators should anticipate retirements and departures of staff, and take steps to recruit replacements in a timely manner. Offering increased pay, benefits, flexibility, and opportunities for career advancement might also improve chances for success with recruitment and retention [147]. Providing workplace support can have a protective effect on overall workforce well-being. Organizational cultures that commit to workforce well-being can help ensure that healthcare professionals are able to consistently support their mental health and access healthy lifestyle behaviors [269]. Positive working conditions, such as leadership help and support, are associated with lower odds of poor mental health symptoms and burnout [270].

The Role of the Government

In response to need, U.S. Congress has historically passed laws to build the capacity of the healthcare workforce. A cornerstone federal legislation to build this workforce is the Public Health Service Act, enacted in 1944 and originally aimed at infection control and the consolidation of the numerous other public health service laws. The succeeding amendments to this 1944 Public Health Service Act addressed emerging public health challenges. Key amendments include: the Health Maintenance Organization Act of 1973, which aimed to promote developments of HMOs as an alternative to traditional fee-for-service healthcare; the National Childhood Vaccine Injury Act, which established a national program to compensate individuals injured by certain vaccines; the Ryan White CARE Act to provide federal funding for HIV/AIDS care, treatment, and prevention services; and portions of the Affordable Care Act, such as those related to preventive services and health insurance exchanges.

The Nurse Training Act of 1964 (amendment to the 1944 Public Health Services Act) created the widely cited Title VIII Nurse Training that provides many educational incentives for nursing today [271]. Collectively, Title VIII and its amendments provide a broad spectrum of awards for building the nursing workforce capacity, including for basic nursing practice, RN traineeships to advanced practice, diversity grants for persons with a disadvantaged background, nurse retention grants (e.g., for comprehensive geriatric training, career ladders), and a nurse faculty loan program [272; 273]. These awards have been used to recruit or retain those already in the nursing workforce and/or to expand the possibilities of nurses' careers into rural settings.

Funding is important for program viability. Some funding has been extended over time (often through amendments), and the funding for other programs has been allowed to expire. Title VIII and the Public Health Service Act of 1944 are not the only opportunities to improve nursing. Title III funds a loan repayment incentive for health professionals to work in selected health professional shortage areas, and Title IV supports nurses interested in clinical research [274].

Passage of the Affordable Care Act in 2010 expanded Medicaid eligibility, and rural Medicaid enrollment increased in the following years [16]. As many rural populations now have greater insurance access, a greater demand has been placed on healthcare professionals to implement public health services. National Health Service Corps programs provide scholarships and repay educational loans for primary care, dental, and mental and behavioral health clinicians who agree to two, three, or four years of service in designated high-need areas [17].

One of the largest recruitment and retention resources in the nation is 3RNET (National Rural Recruitment and Retention Network), a nonprofit network funded by the Federal Office of Rural Health Policy and member dues. 3RNET has one dedicated network coordinator in each of the 50 states. The IHS, the Cherokee Nation, and the VA are also part of the network. According to 3RNET, more than 2,000 medical professional placements are achieved annually through its recruitment tools, with 90% of these in designated shortage areas [275].

In addition to federal government initiatives for building the rural workforce, states have initiatives to address rural shortages, as discussed (e.g., school loan forgiveness, scholarship programs) [135; 243]. These programs often seek students from backgrounds historically under-represented in health care, such as racial and ethnic minorities, with the aim of improving workforce diversity [135; 153]. States also can receive technical assistance with health workforce planning through the Health Workforce Technical Assistance Center. The Center offers direct technical assistance, educational webinars, and facilitation of access to health workforce data. The Center is funded by HRSA's Bureau of Health Workforce [147].

Workforce Cultural Competency

Cultural competence is a professional mandate in the health professions [276]. The Joint Commission has standards for cultural competence for health organizations [277]. Cultural competency is a dynamic process and an ongoing journey that is informed by cultural encounters [278]. It cannot be achieved by completing a single course or training; rather, cultural competence involves continual learning throughout one's professional career.

A culturally competent rural workforce can help improve the care of unique populations. Professionals should be prepared to care for diverse populations with different behaviors, resources, perceptions of health and health care, and outcomes of care, particularly when working with groups whose culture, language, economic status, age, and/or education result in health disparities and poor health outcomes [279].

Workforce policies should also consider cultural differences. Culturally competent healthcare providers and systems provide care in ways that are appropriate and aligned with patients' social, cultural, and linguistic needs, which in turn affects how patients receive and perceive information and the degree to

which they adhere to recommendations. In acknowledgment of the importance of a culturally competent rural workforce, states have begun to invest in public health educational programs to build upon the competency of the existing rural workforce [135]. As of 2016, more than 30 states had enacted legislation to improve cultural competency in their healthcare workforces [135]. In a 2015 bill, Maryland legislators required the Office of Minority Health and Health Disparities to provide certain health occupations boards with a list of recommended courses. Courses include cultural and linguistic competency, health disparities, and health literacy [135].

Incentive Laws in Underserved Areas

Federal and state governments have passed incentive-type laws to improve the workforce capacity in health professional shortage areas. As discussed, an example of these incentives is loan repayment programs for practitioners who work in shortage areas [280]. The Nurse Corps Loan Repayment Program helps with nursing education debts in return for the registered or advance practice nurse working in an eligible critical shortage facility in a high-need area [281]. A critical shortage facility is defined as a public or private nonprofit healthcare facility located in, designated as, or serving a health professional shortage area having shortages in the primary care or mental-health workforce [281].

The State Loan Repayment Program, offered by the HRSA, provides grant funding for states and territories to develop loan repayment initiatives that work for their residents. The program supports primary medical, mental and behavioral health, and dental clinicians. These providers receive awards through SLRP-funded programs and agree to work in areas with provider shortages. In exchange for their service, the clinicians receive relief from their student debt. The HRSA also offers loan repayment programs for specific health careers (e.g., nursing, pediatrics, pharmacists, behavior health, dental) [282]. The National Health Service Corps Loan Repayment Program provides loan repayment assistance for primary healthcare professionals who agree to work in health professional shortage areas [283]. The clinician must commit to two years of full-time service (minimum 40 hours/week, 45 weeks/year) at an NHSC-approved site to receive the highest award amount (up to $75,000) [283].

Primary Care Professionals

Rural areas have an unmet need for primary care providers. These unmet needs are expected to intensify as a result of demographic changes, coverage expansions resulting from the 2010 Affordable Care Act, and a decline in the rural primary care workforce [144]. Many solutions are at work to offset the expected increased demand for primary care and preventive services. One strategy is to promote the role of non-physician primary care practitioners, such as advanced practice nurses and physician assistants, and to expand the scope of practice for these providers to practice more independently [143]. The role of the paramedic is also being expanded. In Minnesota, for example, as part of a statewide innovation grant, community paramedics are providing a broader range of services, including primary care (e.g., health assessments, chronic disease monitoring, collecting laboratory specimens). In a study evaluating this program and care provided by paramedics, patients with paramedic contact were more likely to have a future primary care visit, to keep post-discharge mental-health visits, and to safely manage medication [284].

Scope-of-practice laws still impose limits on non-physician providers in many states. In 2021, eight proposed scope of practice expansions for nurse practitioners were defeated, but expansions were passed in Delaware and Utah [283] As of March 2023, 27 states and the District of Columbia were full-practice authority states for nurse practitioners, where physician oversight is not required, but 23 states still had reduced or restricted policies in place [285]. The states with the largest shares of rural populations tend to be full-practice authority states for nurse practitioners, which suggests scope-of-practice laws are responding to local needs [286].

Nursing faculty are vital to educating the future nursing workforce. According to a 2019 survey by the American Association of Colleges of Nursing, there were 1,715 faculty vacancies at 488 nursing schools across the country. In total, 84.1% of nursing schools reported a need for additional faculty [287]. This is compounded by a lack of nurse preceptors, who help nursing students obtain necessary clinical hours and gain hands-on experience [287]. Potential strategies used by some states to address these and other issues include: establishing and funding programs to compensate preceptors who would not otherwise have been paid; offering tax credits and incentives to preceptors who practice in rural or underserved areas; requiring coursework in teaching and learning as criteria to become nursing faculty, including coursework in adult education, curriculum development, and evaluation [287].

Dental Workforce

Dental care is a rural problem largely because of a lack of practicing dentists and insufficient dental insurance. A shortage of dental practitioners in rural and micropolitan areas has resulted in emergency departments becoming the alternative for evaluation and treatment of dental conditions [134]. To address this problem, states have passed laws intended to expand the dental care workforce. In Minnesota, for example, additional license types (dental therapists and advanced dental therapists) have been added to help meet the need for dental professionals qualified to provide preventive and restorative dental care, in some cases with less direct supervision [153; 284]. In this case, at least half of a dental therapist's patients must be considered underserved—that is, on public assistance, uninsured, or living in an area with a shortage of dentists [288]. Several states permit new dental profession types to provide dental care under varying levels of supervision by dentists, allowing these providers to meet dental care needs in nontraditional, tribal, school-based, and community settings [153]. In Alaska, where the majority of land is classified as rural, some clinics have sent out dental health aide therapists to distant rural sites to deliver routine restorative care. As a result of this initiative, many recipients were able to have regular access to dental care for the first time [288].

Aside from government actions to increase workforce numbers and to expand the scope of practice, dental care workforce capacity can be built using teledentistry. In California, dental hygienists use teledentistry to improve dental care access for the young and disabled. Dental hygienists go to community settings such as schools, Head Start public programs, and nursing homes, where patients are screened and data are transmitted digitally back to the dentist, who creates a treatment plan for the hygienist to implement [288]. These solutions have potential to mitigate dental disease in rural underserved communities.

Pharmacists

The role of the pharmacist as part of an interdisciplinary team is critical in rural locations, as many work in healthcare worker shortage areas in which the pharmacist may be one of the few healthcare professionals in the community [289]. For example, Iowa has a 31.6% unmet need and North Dakota a 60.8% unmet need for primary care in designated shortage areas. Due to their accessibility and expanding public health roles, pharmacists can help improve community health outcomes, broaden the reach of public health, and close workforce shortage gaps [289]. A survey of pharmacists in North Carolina found that 42% offered additional clinical and education services to community residents, including blood pressure checks, screening for cholesterol and osteoporosis, glucose screening and diabetes counseling, tobacco cessation counseling, and immunizations. Medication deliveries for both their own patients and as a service to other community healthcare organizations also was frequently reported. A reported 83% of pharmacists collaborate with one or more other healthcare organizations within their community, including services to hospice providers (94%), skilled nursing or long-term care facilities (79%), and home health agencies (74%) [290].

Behavioral Health Practitioners

Healthcare workforce planning requires policymakers to pay attention to systemic, structural, and perception challenges that affect the ability to recruit and retain a sufficiently large and diverse workforce.

A report published by the Behavioral Health Workforce Advisory Committee in Washington state is representative of the nationwide need for improvements in recruitment and retention, reimbursement, education and training, licensing, supervision, and care integration to meet the challenges of adequate workforce retention. The short- and long-term recommendations made by the Committee include: increase funding for the state's health corps behavioral health program; provide education for behavioral health employees about loan forgiveness; continue funding for the development and expansion of community behavioral health clinics; adopt measures to address the shortage of clinical training sites; increase apprenticeships; streamline and improve licensure processes; allow probationary licenses for out-of-state practitioners waiting to meet state licensure requirements; address differing supervised practice hours requirements; and integrate behavioral and physical healthcare into primary care [291].

Community Health Workers

Another initiative to build workforce capacity is the community health worker. Community health workers have a strong understanding of their communities and 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 [292]. Providing invaluable support to public health and private care, they are found in public health departments, community locations, primary care settings, and hospitals, and are generally well-positioned to reach patients in rural settings [293]. The role of the community health worker is broad and includes conducting outreach for community health promotion programs, providing community education, and collecting assessment data on community health needs [294]. Community health workers have a long history of service in the United States and are known by many titles, such as community health advisors, lay health advocates, outreach educators, community health representatives, peer health promoters, and peer health educators [293]. Some states have passed laws defining the role of the community health worker, developing standards or credentials, defining their training and certification needs, and collecting community health worker workforce data [144].

To intensify the impact on the public health workforce as a whole and to benefit all public health disciplines, integrating the workforce and sharing priorities are vital [295]. This idea of integrating and sharing of aims is well aligned with the trend of using more collaborative networks and partnerships (public and non-public) in delivering health care in the United States.

THE ROLE OF SCHOOLS

Education is an important element to promoting health and well-being in rural populations. Education combined with community-based action promises to increase the quality, availability, and effectiveness of educational and community-based programs designed to prevent disease and injury, improve health, and enhance quality of life in rural communities [296]. Public health education on physical activity and exercise, nutrition, safe food handling, immunizations, and smoking cessation is vital in rural areas, and this education may be delivered in many settings—home health visits, online educational forums, early care and child education settings, secondary schools, and healthcare visits. Historically, the county public health nurse was active in the school community, working alongside and with school personnel, families, and associations.

As a community resource, rural schools are engaging in health-related activities and promoting a better learning experience for youth. Although the primary focus is on education, in many rural counties, schools serve as a health center or a hub for community health education—these schools may be the only centralized place to meet. The extent that schools are a health gathering place to learn and receive service varies, as each county is unique in its needs, leadership, socioeconomic profile, and demographics.

In schools, children can learn the basics of health and wellness, such as principles of physical activity and nutrition, while also having a place to apply the learned principles [297]. Each day, public schools provide a setting for 49.6 million students to learn about health and healthy behaviors [298]. There are many benefits of teaching and applying healthy lifestyle choices to youth at school. Physical activity at school is reported to result in reduced risk for childhood obesity, mitigation of disease risk factors, and better mental health [298]. Physical activity may be integrated into classroom lessons, through intramural or sports programs, at lunchtime, or during recess [299].

Involving schools and school nurses in public health partnerships can help bridge accessibility and outreach gaps. In Iowa, for example, the departments of public health and education have partnered to improve policy and practices for physical education/activity and nutrition [300]. As part of this initiative, additional funding was provided to improve on-grounds access to water for school children and to increase physical education instructional time [300]. In South Dakota, the departments of health and education in collaboration with a state university provided training to personnel on healthy school meals and physical activity [301]. In addition to learning about health, schools can be a venue for youth to receive clinical health services and counseling. As schools play a role for a healthy lifestyle for youth, they may also be a venue for clinical services, when feasible.

Historically, rural public health nurses worked with schools to promote the health and well-being of youth and families. Much like today, health agencies played a vital role in giving adequate health services, in identifying health issues (i.e., surveillance), providing training or in-servicing of teachers on community health services, and training families and teachers in promoting student growth and well-being. Cooperatively, the county public health nurse promoted good nutrition and food safety, helped with safe storage for school lunches, and provided community education on planting vegetables [302]. Many of these principles and practices are still in place today.

Learning programs that engage the rural nurse vary across school districts depending on the need, policy, and support of funding. According to the National Association of School Nurses, school nurses bring together health care and education and collaboratively develop healthy communities [303]. They apply evidence-based concepts in their practice, promoting both the individual and population-based health of students, providing the coordination of care, serving as advocates for quality student-centered care, and acting to advance academic success [303].

CDC Initiatives

Educating children early regarding healthy lifestyle habits (e.g., good nutrition, physical activity) can promote school performance and help mitigate unhealthy living and disease later in life. In 2012, the CDC introduced the early care and education concept to promote healthy practices early in life, bringing "good habits" into early care facilities and schools. This idea of teaching healthy habits early is based on the belief that it is easier to influence children's food and physical activity choices when they are young, before habits are formed. Developing healthy habits for physical activity and diet early in life can influence daily practices as individuals grow and can favorably influence a child's cognitive development [304]. Early care and education programs promote social, emotional, cognitive, and motor skill development for the very young (up to 3 to 4 years of age). In addition to healthy physical activity, some programs include nutritious meals, support for parents, health screening, and social services. Early care and education programs may be delivered in a variety of ways and settings, including state and district programs (available to all children), federal Head Start programs for low-income children and families, and other programs targeting low-income children at risk. These early childhood education programs are reported to lessen the chance for obesity, improve child cognitive development, reduce the incidence of child abuse and neglect, lessen youth violence, and limit use of emergency department services [305].

The CDC has advocated for the early care and education setting as one of the best settings to implement an obesity prevention program, providing early education to prevent childhood obesity and to promote readiness to learn in childcare centers, family childcare, Head Start, and pre-kindergarten programs across the country [306]. The number of states implementing early care and education programs is growing. As an example, in 2016, New Mexico reported that more than 160 early care and education centers had put wellness policies in place to increase physical activity, good nutrition and breastfeeding practices, and family engagement [307]. The CDC initiative on early care and education has been applied in many states, involving many public and private partners and tailored to meet the needs of youth in different locales and cultures [308].

School health services are not limited to learning healthy habits and accessing preventive services; many schools have been hubs for primary care clinical services for conditions such as asthma, substance abuse, and dental care for both youth and parents [144]. Individuals facing the disparities inherent to rural America (e.g., geographic isolation, poverty, lack of health insurance) may not have another "concrete" place to receive care. School-based health centers often operate as a partnership between the school and a community health center, hospital, or local health department to improve the health of students and the community as a whole [297]. School health services staff can help all students with preventive care (e.g., immunizations, vision and hearing screenings) as well as acute and emergency care.

The school nurse and other care providers can play a critical role in the daily management of chronic health issues, such as asthma and allergies, among school-aged children [298; 309]. Many public health nurses monitor at-risk students and engage them in prevention strategies; closely treating and managing chronic conditions can help offset many of the consequences. For example, asthma education programs in school districts can promote improved symptom management and fewer school absences [42]. Ideally, school education can set the foundation for a healthy lifestyle in later years, but some counties/districts may not have the funding to expand the role of the school beyond health education to also include other community health activities.

The Whole School, Whole Community, Whole Child Model

The CDC framework for promoting classroom health is called the Whole School, Whole Community, Whole Child (WSCC) model. It is a student-centered model that emphasizes the role of the community in supporting the school, the connections between health and academic achievement, and the importance of evidence-based school policies and practices [310]. The WSCC model aligns the goals of education, public health, and school health. Because school education and public health give service to the same population and in the same setting, the WSCC model depends on collaboration between the sectors interested in promoting youth cognitive, emotional, physical, and social development. The elements of WSCC create a model for promoting a whole-child approach to education and include [310]:

- Physical education and physical activity
- Nutrition environment and services
- Health education
- Social and emotional school climate
- Physical environment
- Health services
- Counseling, psychological, and social services
- Employee wellness
- Community involvement
- Family engagement

This model emphasizes the sharing of the school facility as a community health and fitness center for families and youth. Health services, including clinical services, are important to the holistic well-being of rural youth. These services may be provided at schools by school nurses, nurse practitioners, physicians, dental professionals, and allied health and other disciplines in order to mitigate health risks and to manage chronic conditions, with medical care referrals made when needed.

CONSIDERATIONS FOR NON-ENGLISH-PROFICIENT PATIENTS

Language and cultural barriers have the potential for far-reaching effect, given the growing percentages of racial/ethnic populations. The rural community is diversifying, and nurses working in these areas would benefit from an understanding of cultural competence and collaborating with interpreters. When there is an obvious disconnect in the communication process between the practitioner and patient due to the patient's lack of proficiency in the English language, an interpreter is required.

According to U.S. Census Bureau data from 2023, 22.5% of households speak a language other than English at home [311]. Clinicians should ask their patients what language they prefer for their medical care information, as some individuals prefer their native language even though they have said they can understand and discuss symptoms in English [312]. Translation services should be provided for patients who do not understand the clinician's language. "Ad hoc" interpreters (family members, friends, bilingual staff members,) are often used instead of professional interpreters for a variety of reasons, including convenience and cost. However, clinicians should check with their state's health officials about the use of ad hoc interpreters, as several states have laws about who can interpret medical information for a patient [313]. Even when allowed by law, the use of a patient's family member or friend as an interpreter should be avoided, as the patient may not be as forthcoming with information and the family member or friend may not remain objective [313]. Children should especially be avoided as interpreters, as their understanding of medical language is limited and they may filter information to protect their parents or other adult family members [313]. Individuals with limited English language skills have actually indicated a preference for professional interpreters rather than family members [314].

Most important, perhaps, is the fact that clinical consequences are more likely with ad hoc interpreters than with professional interpreters [315]. A systematic review of the literature showed that the use of professional interpreters facilitates a broader understanding and leads to better clinical care than the use of ad hoc interpreters, and many studies have demonstrated that the lack of an interpreter for patients with limited English proficiency compromises the quality of care and that the use of professional interpreters improves communication (errors and comprehension), utilization, clinical outcomes, and patient satisfaction with care [316; 317].

Clinicians should use plain language in their discussions with their patients who have low literacy or limited English proficiency. They should ask them to repeat pertinent information in their own words to confirm understanding, and reinforcement with the use of low-literacy or translated educational materials may be helpful.

CONCLUSION

The rural public health system is working to prevent disease and promote the highest level of well-being and quality of life for rural populations/communities in the United States. The role of the rural public health nurse is ever-evolving, as new public health infrastructures are being considered and implemented and as evidence-based ideas are being applied. Progress has been made in transforming the rural healthcare system and meeting the needs of every public community. However, more work is required, and the public health nurse is in the unique position to help improve rural health care and the health of rural communities.

The need to reach geographically isolated patients in need of care has been a driving goal behind telehealth evolution, and Internet technologies have the potential to bring care and health-promoting programs to remote populations. In the future, advanced communication technology will likely play an even bigger role in improving access to services and broadening the scope of prevention initiatives. With time, technology can improve the coordination of care and decrease fragmentation of services. Currently, more funding and technology infrastructure is required, as not all rural areas have the resources to benefit from these technologies.

Rural health is strengthened from the maturing of partnerships and collaborative efforts of public health stakeholders (e.g., public health agencies, private organizations, community residents) working together and sharing resources. These types of efforts have the potential to improve the rural healthcare system. Although strides have been made, more work is necessary to ensure that all rural populations are functioning at their best level.

RESOURCES

USDA Rural Development Program
https://www.rd.usda.gov

CDC Rural Health
https://www.cdc.gov/ruralhealth

National Rural Health Association
https://www.ruralhealth.us

Rural Nurse Organization
http://www.rno.org

Federal Office of Rural Health Policy
https://www.hrsa.gov/rural-health

Rural Health Information Hub
https://www.ruralhealthinfo.org/toolkits/aging/2/supporting-caregivers

National Rural Health Resource Center
https://www.ruralcenter.org

Implicit Bias in Health Care

The role of implicit biases on healthcare outcomes has become a concern, as there is some evidence that implicit biases contribute to health disparities, professionals' attitudes toward and interactions with patients, quality of care, diagnoses, and treatment decisions. This may produce differences in help-seeking, diagnoses, and ultimately treatments and interventions. Implicit biases may also unwittingly produce professional behaviors, attitudes, and interactions that reduce patients' trust and comfort with their provider, leading to earlier termination of visits and/or reduced adherence and follow-up. Disadvantaged groups are marginalized in the healthcare system and vulnerable on multiple levels; health professionals' implicit biases can further exacerbate these existing disadvantages.

Interventions or strategies designed to reduce implicit bias may be categorized as change-based or control-based. Change-based interventions focus on reducing or changing cognitive associations underlying implicit biases. These interventions might include challenging stereotypes. Conversely, control-based interventions involve reducing the effects of the implicit bias on the individual's behaviors. These strategies include increasing awareness of biased thoughts and responses. The two types of interventions are not mutually exclusive and may be used synergistically.

Works Cited

1. Rural Health Information Hub. Telehealth and Health Information Technology in Rural Healthcare. Available at https://www.ruralhealthinfo.org/topics/telehealth-health-it. Last accessed July 17, 2025.
2. American Public Health Association. What is Public Health? Available at https://www.apha.org/what-is-public-health. Last accessed July 17, 2025.
3. Centers for Disease Control and Prevention. Public Health Professionals Gateway. 10 Essential Public Health Services. Available at https://www.cdc.gov/public-health-gateway/php/about/index.html. Last accessed July 17, 2025.
4. Health Resources and Services Administration. Preparing Nurses for New Roles in Population Health Management. Available at https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/nursing/reports/2016-fourteenthreport.pdf. Last accessed July 17, 2025.
5. Centers for Disease Control and Prevention. Introduction to Public Health. Available at https://www.cdc.gov/publichealth101/index.html. Last accessed July 17, 2025.
6. U.S. Department of Agriculture Economic Research Service. Defining the "Rural" in Rural America. Available at https://www.ers.usda.gov/amber-waves/2008/june/defining-the-rural-in-rural-america/. Last accessed July 17, 2025.
7. U.S. Department of Agriculture Economic Research Service. Rural Classifications - What is Rural? Available at https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural/. Last accessed July 17, 2025.
8. U.S. Census Bureau. Defining Rural at the U.S. Census Bureau: American Community Survey and Geography Brief. Available at https://www2.census.gov/geo/pdfs/reference/ua/Defining_Rural.pdf. Last accessed July 17, 2025.
9. U.S. Census Bureau. A Century of Delineating a Changing Landscape: The Census Bureau's Urban and Rural Classification, 1910 to 2010. Available at https://www2.census.gov/geo/pdfs/reference/ua/Century_of_Defining_Urban.pdf. Last accessed July 17, 2025.
10. U.S. Department of Agriculture Economic Research Service. Rural Classifications. Available at https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications. Last accessed July 17, 2025.
11. National Rural Health Association Policy Brief. Designation of Frontier Health Professional Shortage Areas. Available at https://www.ruralhealth.us/getmedia/21dbd0f5-0548-4271-821a-45313296429d/PolicybriefFRONTIER.pdf. Last accessed July 17, 2025.
12. U.S. Department of Agriculture Economic Research Service. Population and Migration. Available at https://www.ers.usda.gov/topics/rural-economy-population/population-migration. Last accessed July 17, 2025.
13. U.S. Department of Agriculture Economic Research Service. Rural America at a Glance: 2021 Edition. Available at https://ers.usda.gov/sites/default/files/_laserfiche/publications/102576/EIB-230.pdf. Last accessed July 17, 2025.
14. Ingram DD, Franco SJ. 2013 NCHS urban-rural classification scheme for counties. *Vital Health Stat.* 2014;4(166):1-73.
15. National Rural Health Association Policy Position. Definition of Frontier. Available at https://www.ruralhealth.us/getmedia/8d486646-c11f-4d6b-9c22-32a3a47f332c/08statementoffrontier.pdf. Last accessed July 17, 2025.
16. Patient Protection and Affordable Care Act. Public L No. 111-148, 124 Stat 119.
17. Health Resources and Services Administration. Statement of James Macrae Acting Administrator Health Resources and Services Administration Before the U.S. Senate Health, Education, Labor and Pensions Committee, Washington, D.C. Available at https://www.help.senate.gov/imo/media/doc/Macrae1.pdf. Last accessed July 17, 2025.
18. National Museum of American History. Midwives on Horseback: Saddlebags and Science. Available at https://americanhistory.si.edu/blog/midwives-horseback-saddlebags-and-science. Last accessed July 17, 2025.
19. Rural Health Information Hub. Temple KM. Rural Health Clinic Program at 45 Years: Created for Access and Still Delivering Care. Available at https://www.ruralhealthinfo.org/rural-monitor/rhc-program. Last accessed July 17, 2025.
20. U.S. Census Bureau. Change in Rural and Urban Population Size: 1910–2010. Available at https://www.census.gov/content/dam/Census/library/visualizations/2016/comm/acs-rural-urban.pdf. Last accessed July 17, 2025.
21. U.S. Census Bureau. American Community Survey 5-Year Data (2009-2023). Available at https://www.census.gov/data/developers/data-sets/acs-5year.html. Last accessed July 17, 2025.
22. Centers for Disease Control and Prevention. About Rural Health. Available at https://www.cdc.gov/rural-health/php/about/?CDC_AAref_Val=https://www.cdc.gov/ruralhealth/about.html. Last accessed July 17, 2025.
23. Board of Governors of the Federal Reserve System. FEDS Notes: Rural Employment Disparities by Race, Ethnicity, and Region. Available at https://www.federalreserve.gov/econres/notes/feds-notes/rural-employment-disparities-by-race-ethnicity-and-region-20240531.html. Last accessed July 17, 2025.
24. U.S. Department of Agriculture Economic Research Service. Employment and Education - Rural Employment and Unemployment. Available at https://www.ers.usda.gov/topics/rural-economy-population/employment-education/rural-employment-and-unemployment/. Last accessed July 17, 2025.
25. U.S. Department of Agriculture Economic Research Service. Rural Poverty at a Glance: Rural Development Research Report 100. Available at https://ers.usda.gov/sites/default/files/_laserfiche/publications/47002/30445_rdrr100full_002.pdf?v=73429. Last accessed July 17, 2025.

26. U.S. Department of Agriculture Economic Research Service. Rural Poverty and Well-Being. Available at https://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being. Last accessed July 17, 2025.
27. U.S. Department of Agriculture Economic Research Service. Rural America at a Glance: 2024 Edition. Available at https://www.ers.usda.gov/publications/pub-details?pubid=110350. Last accessed July 17, 2025.
28. Rural Health Information Hub. Average Median Household Income for Metro and Nonmetro Counties, 2010-2023. Available at https://www.ruralhealthinfo.org/charts/59. Last accessed July 17, 2025.
29. U.S. Federal Housing. Who Lives in Rural America? Available at https://www.fhfa.gov/blog/insights/who-lives-in-rural-america#ftn5. Last accessed July 17, 2025.
30. U.S. Census Bureau. A Comparison of Rural and Urban America: Household Income and Poverty. Available at https://www.census.gov/newsroom/blogs/random-samplings/2016/12/a_comparison_of_rura.html. Last accessed July 17, 2025.
31. U.S. Census Bureau. Rates of Uninsured Fall in Rural Counties, Remain Higher Than Urban Counties. Available at https://www.census.gov/library/stories/2019/04/health-insurance-rural-america.html. Last accessed July 17, 2025.
32. National Center for Chronic Disease Prevention and Health Promotion. About Chronic Diseases. Available at https://www.cdc.gov/chronic-disease/about/?CDC_AAref_Val=https://www.cdc.gov/chronicdisease/about/index.htm. Last accessed July 17, 2025.
33. U.S. Department of Health and Human Services. Multiple Chronic Conditions: A Strategic Framework: Optimum Health and Quality of Life for Individuals with Multiple Chronic Conditions. Available at https://www.hhs.gov/sites/default/files/ash/initiatives/mcc/mcc_framework.pdf. Last accessed July 17, 2025.
34. Centers for Disease Control and Prevention. Leading Causes of Death in Rural America. Available at https://www.cdc.gov/rural-health/php/about/leading-causes-of-death.html. Last accessed July 17, 2025.
35. Centers for Disease Control and Prevention. Leading Causes of Death in Rural America. Available at https://www.cdc.gov/rural-health/php/about/leading-causes-of-death.html. Last accessed July 17, 2025.
36. Bolin J, Ferdinand AO. The Burden of Diabetes in Rural America. Available at https://www.ruralhealthresearch.org/projects/811. Last accessed July 17, 2025.
37. Callaghan TH, Ferdinand AO, Akinlotan MA, et al. The changing landscape of diabetes mortality in the United States across region and rurality: 1999–2016. *Rural Health*. 2020;36(3):410-415.
38. Centers for Disease Control and Prevention. The Power of Prevention Chronic Disease...The Public Health Challenge of the 21st Century [Archive]. Available at https://stacks.cdc.gov/view/cdc/5509. Last accessed July 17, 2025.
39. West Virginia Department of Health and Human Resources Health Statistics Center. Chronic Lower Respiratory Disease: A National Burden. Available at http://www.wvdhhr.org/bph/hsc/pubs/other/clrd/national.htm. Last accessed July 17, 2025.
40. Temple KM. Pulmonary Health in Rural America: Cause and Impact of Work-Related Lung Diseases. Available at https://www.ruralhealthinfo.org/rural-monitor/occupational-lung-diseases. Last accessed July 17, 2025.
41. Reyfman PA, Khuder B, Pierce et al. Urban-rural mortality disparities from chronic lower respiratory diseases in the United States: 1999–2019. *Am J Respir Crit Care Med*. 2021;203(11):1435-1437.
42. Centers for Disease Control and Prevention. Research Brief: Chronic Health Conditions and Academic Achievement, 2017 [Archive]. Available at https://archive.cdc.gov/#/details?url=https://www.cdc.gov/healthyschools/chronic_conditions/pdfs/2017_02_15-CHC-and-Academic-Achievement_Final_508.pdf. Last accessed July 17, 2025.
43. Centers for Disease Control and Prevention. Arthritis in Rural America. Available at https://www.cdc.gov/rural-health/php/public-health-strategy/arthritis-in-rural-america.html. Last accessed July 17, 2025.
44. Centers for Disease Control and Prevention. Arthritis in Rural America. Available at https://www.cdc.gov/rural-health/php/public-health-strategy/arthritis-in-rural-america.html?CDC_AAref_Val=https://www.cdc.gov/ruralhealth/arthritis/Arthritis.html. Last accessed July 17, 2025.
45. Boring MA, Hootman JA, Liu Y, et al. Prevalence of arthritis and arthritis-attributable activity limitation by urban-rural county classification—United States, 2015. *MMWR*. 2017;66(20):527-532.
46. Panicker L. Nurses' perceptions of parent empowerment in chronic illness. *Contemporary Nurse*. 2013;45(2):210-219.
47. Zhang N, Li Q, Chen S, et al. Effectiveness of nurse-led electronic health interventions on illness management in patients with chronic heart failure: A systematic review and meta-analysis. *Int J Nurs Stud*. 2024;150:104630.
48. Pierce L, Lutz BJ. Family caregiving. In: Larsen PD (ed). *Lubkin's Chronic Illness: Impact and Interventions*. 10th ed. Sudbury, MA: Jones and Bartlett Publishers; 2017: 191-226.
49. Sawyer SM, Drew S, Yeo MS, Britto MT. Adolescents with a chronic condition: challenges living, challenges treating. *Lancet*. 2007;369(9571):1481-1489.
50. Livneh H, Antonak RF. Psychosocial adaptation to chronic illness and disability: a primer for counselors. *J Counseling Dev*. 2005;83(1):12-20.
51. Boss P, Couden BA. Ambiguous loss from chronic physical illness: clinical interventions with individuals, couples, and families. *J Clin Psychol*. 2002;58(11):1351-1360.

52. Berry JO, Hardman ML. Families and the adult years. In: Berry JO, Hardman ML (eds). *Lifespan Perspectives on the Family and Disability*. 2nd ed. Dallas, TX: Pro-Ed, Inc.; 2008.
53. Brown DK, Lash S, Wright B, Tomisek A. Strengthening the Direct Service Workforce in Rural Areas. Available at https://www.medicaid.gov/medicaid/long-term-services-supports/downloads/rural-area-issue-brief.pdf. Last accessed July 17, 2025.
54. Tkatch R, Bazarko D, Musich S, et al. A pilot online mindfulness intervention to decrease caregiver burden and improve psychological well-being. *J Evid Based Complementary Altern Med*. 2017;22(4):736-743.
55. Meyer OL, Nguyen KH, Dao TN, Vu P, Arean P, Hinton L. The sociocultural context of caregiving experiences for Vietnamese dementia family caregivers. *Asian Am J Psychol*. 2015;6(3):263-272.
56. Clark JJ, Leukefeld C, Godlaski T. Case management and behavioral contracting components of rural substance abuse treatment. *J Subst Abuse Treat*. 1999;17(4):293-304.
57. McDaniel SH, Doherty WJ, Hepworth J. Couples and illness. In: McDaniel SH, Doherty WJ, Hepworth J (eds). *Medical Family Therapy and Integrated Care*. 2nd ed. Washington, DC: American Psychological Association; 2014: 151-168.
58. Biegel DE, Sales E, Schulz R. The outcomes of interventions for caregivers. In: Biegel DE, Sales E, Schulz R (eds). *Family Caregiving in Chronic Illness*. Thousand Oaks, CA: Sage Publications, Inc.; 1990: 214-296.
59. López-Larrosa S. Quality of life, treatment adherence, and locus of control: multiple family groups for chronic medical illnesses. *Fam Process*. 2013;52(4):685-696.
60. Liljeroos M, Ågren S, Jaarsma T, Årestedt K, Strömberg A. Long-term effects of a dyadic psycho-educational intervention on caregiver burden and morbidity in partners of patients with heart failure: a randomized controlled trial. *Qual Life Res*. 2017;26(2):367-379.
61. Limiñana-Gras RM, Colodro-Conde L, Cuéllar-Flores I, Sánchez-López MP. Clinical efficacy of psychoeducational interventions with family caregivers. *Educ Gerontol*. 2016;42(1):37-48.
62. Wennberg A, Dye C, Streetman-Loy B, Hiep P. Alzheimer's patient familial caregivers: a review of burden and interventions. *Health Soc Work*. 2015;40(4):e162-e169.
63. Zegwaard MI, Aartsen MJ, Grypdonck MHF, Cuijpers P. Trust: an essential condition in the application of a caregiver support intervention in nursing practice. *BMC Psychiatry*. 2017;17:47.
64. Findley PA. Social work practice in the chronic care model: chronic illness and disability care. *J Soc Work*. 2014;14(1):83-95.
65. American Lung Association. Disparities in Lung Health Series: Cutting Tobacco's Rural Roots. Available at https://healthforward.org/wp-content/uploads/2015/07/cutting-tobaccos-rural-roots.pdf. Last accessed July 17, 2025.
66. U.S. Food and Drug Administration. Rural Tobacco Use: Research from the Population Assessment of Tobacco and Health (PATH) Study. Available at https://fda.report/media/133281/Rural+Tobacco+Use.pdf. Last accessed July 17, 2025.
67. Centers for Disease Control and Prevention. Smokeless Tobacco Product Use in the United States. Available at https://www.cdc.gov/tobacco/other-tobacco-products/smokeless-product-use-in-the-us.html?CDC_AAref_Val=https://www.cdc.gov/tobacco/data_statistics/fact_sheets/smokeless/use_us/index.htm. Last accessed July 17, 2025.
68. American Cancer Society. Health Risks of Smokeless Tobacco. Available at https://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer/smokeless-tobacco.html. Last accessed July 17, 2025.
69. Johansson A, Hermansson G, Ludvigsson J. How should parents protect their children from environmental tobacco-smoke exposure in the home? *Pediatrics*. 2004;113(4):e291-e295.
70. U.S. Food and Drug Administration. The Real Cost Campaign. Available at https://www.fda.gov/tobacco-products/public-health-education-campaigns/real-cost-campaign. Last accessed July 17, 2025.
71. Lundeen EA, Park S, Pan L, O'Toole T, Matthews K, Blanck HM. Obesity prevalence among adults living in metropolitan and nonmetropolitan counties—United States, 2016. *MMWR*. 2018;67(23):653-658.
72. Hales CM, Carroll MD, Fryar CD, Ogden CL. Prevalence of obesity among adults and youth: United States, 2015–2016. *NCHS Data Brief*. 2017;(288):1-8.
73. Centers for Disease Control and Prevention. Adult Obesity Prevalence Maps. Available at https://www.cdc.gov/obesity/data-and-statistics/adult-obesity-prevalence-maps.html?CDC_AAref_Val=https://www.cdc.gov/obesity/data/prevalence-maps.html. Last accessed July 17, 2025.
74. Centers for Disease Control and Prevention. Cancer in Rural America. Available at https://www.cdc.gov/rural-health/php/public-health-strategy/public-health-considerations-for-cancer-in-rural-america.html?CDC_AAref_Val=https://www.cdc.gov/ruralhealth/cancer.html. Last accessed July 17, 2025.
75. Henley SJ, Anderson RN, Thomas CC, Massetti GM, Peaker B, Richardson LC. Invasive cancer incidence, 2004–2013, and deaths, 2006–2015, in nonmetropolitan and metropolitan counties—United States. *MMWR*. 2017;66(14):1-13.
76. Healthy People 2030. Drug and Alcohol Use. Available at https://health.gov/healthypeople/objectives-and-data/browse-objectives/drug-and-alcohol-use. Last accessed July 17, 2025.
77. Rural Health Information Hub. Substance Abuse and Misuse in Rural Areas. Available at https://www.ruralhealthinfo.org/topics/substance-abuse. Last accessed July 17, 2025.

78. Centers for Disease Control and Prevention. Rural Health. Drug Overdose in Rural America as a Public Health Issue. Available at https://www.cdc.gov/rural-health/php/public-health-strategy/public-health-considerations-for-drug-overdose-in-rural-america.html#:~:text=In%20rural%20areas%2C%20rates%20of,are%20higher%20in%20rural%20areas. Last accessed July 17, 2025.
79. U.S. Drug Enforcement Administration. 2020 National Drug Threat Assessment. Available at https://www.dea.gov/documents/2021/03/02/2020-national-drug-threat-assessment. Last accessed July 17, 2025.
80. National Association of State Alcohol and Drug Abuse Directors. Methamphetamine. Available at https://nasadad.org/wp-content/uploads/2023/10/Methamphetamine-2023.pdf. Last accessed July 17, 2025.
81. Freese TE, Obert J, Dickow A, Cohen J, Lord RH. Methamphetamine abuse: issues for special populations. *J Psychoactive Drugs*. 2000;32(2):177-182.
82. Kraman P. *Trends Alert: Drug Abuse in Americ a – Rural Meth*. Lexington, KY: The Council of State Governments; 2004.
83. U.S. Department of Agriculture. USDA Announces Telemedicine Funding to Address Opioid Epidemic in Appalachia. Available at https://www.usda.gov/about-usda/news/press-releases/2016/06/30/usda-announces-telemedicine-funding-address-opioid-epidemic-appalachia. Last accessed July 17, 2025.
84. Substance Abuse and Mental Health Services Administration. SAMHSA Reaffirms Efforts to Address the Public Health Emergency on the Opioid Crisis. Available at https://us.pagefreezer.com/en-US/wa/browse/661325a7-6075-423b-ac24-3ae5328f8435?find-by-timestamp=2025-01-17T20:18:59Z&url=https:%2F%2Fwww.samhsa.gov%2Fnewsroom%2Fpress-announcements%2F20171026010000&timestamp=2025-01-17T17:31:16Z. Last accessed July 17, 2025.
85. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Preventing Suicide: A Technical Package of Policies, Programs, and Practices [Archive]. Available at https://stacks.cdc.gov/view/cdc/44275. Last accessed July 17, 2025.
86. Centers for Disease Control and Prevention. Suicide Prevention: Rural Policy Brief. Available at https://www.cdc.gov/rural-health/php/policy-briefs/suicide-policy-brief.html. Last accessed July 17, 2025.
87. Centers for Disease Control and Prevention. Preventing Suicide: Suicide Prevention Fact Sheet. Available at https://www.cdc.gov/suicide/pdf/ncipc-suicide-factsheet-508_final.pdf. Last accessed July 17, 2025.
88. Steelesmith DL, Fontanella CA, Campo JV, Bridge JA, Warren KL, Root ED. Contextual factors associated with county-level suicide rates in the United States, 1999 to 2016. *JAMA Netw Open*. 2019;2(9):e1910936.
89. Kegler SR, Stone DM, Holland KM. Trends in suicide by level of urbanization—United States, 1999–2015. *MMWR*. 2017;66(10):270-273.
90. U.S. Preventive Services Task Force. *Screening for Suicide Risk in Primary Care: A Systematic Evidence Review for the U.S. Preventive Services Task Force: Evidence Synthesis, No. 103*. Rockville, MD: Agency for Healthcare Research and Quality; 2013.
91. Canadian Task Force on Preventive Health Care. Recommendations on screening for depression in adults. *CMAJ*. 2013;185(9):775-782.
92. American Academy of Pediatrics. Suicide: Blueprint for Youth Suicide Prevention. Available at https://www.aap.org/en/patient-care/blueprint-for-youth-suicide-prevention. Last accessed July 17, 2025.
93. American Academy of Child and Adolescent Psychiatry. Policy Statement on Suicide Prevention. Available at https://www.aacap.org/aacap/Policy_Statements/2019/AACAP_Policy_Statement_on_Suicide_Prevention.aspx. Last accessed July 17, 2025.
94. American Medical Association. Addressing Increases in Youth Suicide. Available at https://www.ama-assn.org/system/files/2021-05/j21-csaph03.pdf. Last accessed July 17, 2025.
95. World Health Organization. Preventing Suicide: A Resource Series. Available at https://www.who.int/publications/i/item/preventing-suicide-a-resource-series. Last accessed July 17, 2025.
96. American Association of Suicidology. Suicide Loss Survivors. Available at https://suicidology.org/community-support-resources/suicide-loss-survivors/. Last accessed July 17, 2025.
97. American Association of Suicidology. Facts and Statistics. Available at https://suicidology.org/facts-and-statistics. Last accessed July 17, 2025.
98. Breiding MJ, Ziembroski JS, Black MC. Prevalence of rural intimate partner violence in 16 U.S. states, 2005. *J Rural Health*. 2009;25(3):240-246.
99. Perez-Patron MJ, Downing NR, Montalvo-Liendo N, Taylor BD. Rural Versus Urban Prevalence of Intimate Partner Violence-Related Emergency Department Visits, 2009–2014. Available at https://pure.aah.org/en/publications/rural-versus-urban-prevalence-of-intimate-partner-violence-relate. Last accessed July 17, 2025.
100. Edwards KM. Intimate partner violence and the rural-urban-suburban divide: myth or reality? A critical review of the literature. *Trauma Violence Abuse*. 2015;16(3):359-373.
101. Edwards KM, Mattingly MJ, Dixon KJ, Banyard VL. Community matters: intimate partner violence among rural young adults. *Am J Community Psychol*. 2014;53(1-2):198-207.
102. Peek-Asa C, Wallis A, Harland K, Beyer K, Dickey P, Saftlas A. Rural disparity in domestic violence prevalence and access to resources. *J Womens Health (Larchmt)*. 2011;20(11):1743-1749.

103. Gray MJ, Hassija CM, Jaconis M, et al. Provision of evidence-based therapies to rural survivors of domestic violence and sexual assault via telehealth: treatment outcomes and clinical training benefits. *Train Educ Prof Psychol.* 2015;9(3):235-241.

104. National Prevention Council. National Prevention Strategy: America's Plan for Better Health and Wellness. Available at https://www.hhs.gov/sites/default/files/disease-prevention-wellness-report.pdf. Last accessed July 17, 2025.

105. Centers for Disease Control and Prevention. Motor Vehicle Safety in Rural America. Available at https://www.cdc.gov/rural-health/php/public-health-strategy/motor-vehicle-safety-in-rural-america.html?CDC_AAref_Val=https://www.cdc.gov/ruralhealth/MotorVehicleSafety.html. Last accessed July 17, 2025.

106. Henning-Smith C, Kozhimannil KB. Rural-urban differences in risk factors for motor vehicle fatalities. *Health Equity.* 2018;2(1):260-263.

107. Pew Research Center. The Demographics of Gun Ownership. Available at https://www.pewsocialtrends.org/2017/06/22/the-demographics-of-gun-ownership. Last accessed July 17, 2025.

108. Everytown for Gun Safety. Domestic Violence. Available at https://everytownresearch.org/issue/domestic-violence. Last accessed July 17, 2025.

109. Moffic HS. The Psychology of Guns: 12 Steps Toward More Safety. Available at https://www.psychiatrictimes.com/view/psychology-guns-12-steps-toward-more-safety. Last accessed July 17, 2025.

110. McCourt AD, Vernick JS. Law, ethics, and conversations between physicians and patients about firearms in the home. *AMA J Ethics.* 2018;20(1):69-76.

111. U.S. Department of Agriculture. Rural Veterans at a Glance. Available at https://ers.usda.gov/sites/default/files/_laserfiche/publications/42891/40612_eb25.pdf. Last accessed July 17, 2025.

112. U.S. Department of Agriculture. Veterans. Available at https://www.usda.gov/farming-and-ranching/agricultural-education-and-outreach/veterans. Last accessed June 25, 2025.

113. Rural Health Information Hub. Rural Veterans and Access to Healthcare. Available at https://www.ruralhealthinfo.org/topics/returning-soldier-and-veteran-health#. Last accessed July 17, 2025.

114. Seehusen DA. Screening for veteran status in the primary care setting. *J Am Board Fam Med.* 2010;23(6):700-701.

115. Kime P. Experts: Docs Should Ask about Patients' Military History. Available at https://www.militarytimes.com/pay-benefits/military-benefits/health-care/2015/02/16/experts-docs-should-ask-about-patients-military-history/#:~:text=When%20taking%20a%20patient's%20social,former%20American%20Psychoanalytic%20Association%20president. Last accessed July 17, 2025.

116. American Academy of Nursing. Have You Ever Served? Available at http://www.haveyoueverserved.com. Last accessed July 17, 2025.

117. Phoenix Australia. Australian Guidelines for the Treatment of Adults with Acute Stress Disorder and Posttraumatic Stress Disorder. Available at https://www.phoenixaustralia.org/australian-guidelines-for-ptsd/. Last accessed July 17, 2025.

118. McFarlane AC, Hodson SE, Van Hooff M, Davies C, Australia Department of Defense. *Mental Health in the Australian Defense Force. 2010 ADF Mental Health and Wellbeing Study: Full Report*. Canberra: Department of Defense; 2011.

119. U.S. Department of Defense, U.S. Department of Veterans Affairs. Management of Posttraumatic Stress Disorder and Acute Stress Disorder 2023. Available at https://www.healthquality.va.gov/guidelines/mh/ptsd. Last accessed July 17, 2025.

120. U.S. Department of Veterans Affairs. VA/DoD Clinical Practice Guidelines: Assessment and Management of Patients at Risk for Suicide (2024). Available at https://www.healthquality.va.gov/guidelines/MH/srb. Last accessed July 17, 2025.

121. Kessler RC, Warner CH, Ivany C, et al. Predicting suicides after psychiatric hospitalization in US Army soldiers: the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *JAMA Psychiatry.* 2015;72(1):49-57.

122. Sundararman R, Panangala SV, Lister SA. CRS Report for Congress: Suicide Prevention Among Veterans. Available at https://sgp.fas.org/crs/misc/RL34471.pdf. Last accessed July 17, 2025.

123. U.S. Department of Veterans Affairs Office of Inspector General. *Healthcare Inspection. Evaluation of Suicide Prevention Program Implementation in Veterans Health Administration Facilities*. Washington, DC: VA Office of Inspector General; 2017.

124. DeSimone D. Concerns Rise Over Military Suicide Rates; Here's How The USO is Trying to Help. Available at https://www.uso.org/stories/2664-military-suicide-rates-are-at-an-all-time-high-heres-how-were-trying-to-help. Last accessed July 17, 2025.

125. Rural Health Information Hub. Rural Healthcare Workforce. Available at https://www.ruralhealthinfo.org/topics/health-care-workforce. Last accessed July 17, 2025.

126. McFarland BH, Kaplan MS, Huguet N. Datapoints: self-inflicted deaths among women with U.S. military service: a hidden epidemic? *Psychiatr Serv.* 2010;61(12):1177.

127. Rozanov V, Carli V. Suicide among war veterans. *Int J Environ Res Public Health.* 2012;9(7):2504-2519.

128. U.S. Department of Veterans Affairs. Mental Health. Military Sexual Trauma. Available at https://www.mentalhealth.va.gov/msthome. Last accessed July 17, 2025.

129. U.S. Department of Defense. Department of Defense Annual Report on Sexual Assault in the Military: Fiscal Year 2024. Available at https://www.sapr.mil/reports. Last accessed July 17, 2025.

130. Barth SK, Kimerling RE, Pavao J, et al. Military sexual trauma among recent veterans: correlates of sexual assault and sexual harassment. *Am J Prev Med.* 2016;50(1):77-86.

131. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. Test revision. Washington, DC: American Psychiatric Association; 2022.

132. Kessler RC, Heeringa SG, Stein MB, et al. Thirty-day prevalence of DSM-IV mental disorders among nondeployed soldiers in the US Army: results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *JAMA Psychiatry*. 2014;71(5):504-513.

133. National Advisory Committee on Rural Health and Human Services. Improving Oral Health Care Services in Rural America. Available at https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/rural/2018-oral-health-policy-brief.pdf. Last accessed July 17, 2025.

134. Agency for Healthcare Research and Quality. National Healthcare Quality and Disparities Report. Available at https://www.ahrq.gov/research/findings/nhqrdr/index.html. Last accessed July 17, 2025.

135. National Conference of State Legislatures. State Approaches to Reducing Health Disparities. Available at https://documents.ncsl.org/wwwncsl/Health/HealthDisparities_2017_31448.pdf?sv=2017. Last accessed July 17, 2025.

136. National Rural Health Association. Center for Rural Public/Population Health. Available at https://www.ruralhealth.us/programs/center-for-rural-public-population-health. Last accessed July 17, 2025.

137. U.S. Department of Health and Human Services. Report to Congress: E-Health and Telemedicine. Available at https://aspe.hhs.gov/sites/default/files/private/pdf/206751/TelemedicineE-HealthReport.pdf. Last accessed July 17, 2025.

138. Schmeida M. *Telehealth Innovation in the American States*. Kent, OH: Kent State University; 2005.

139. National Advisory Committee on Rural Health and Human Services. Rural Health Insurance Market Challenges, Policy Brief and Recommendations. Available at https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/rural/2018-rural-health-insurance-market-challenges.pdf. Last accessed July 17, 2025.

140. National Rural Health Association. NRHA Policy. Available at https://www.ruralhealth.us/advocacy/rural-health-policy-documents. Last accessed July 17, 2025.

141. Wilkinson F. Nepal's High-Risk Helicopter Rescue Unit. Available at https://www.mensjournal.com/adventure/nepals-high-risk-helicopter-rescue-unit-20150113. Last accessed July 17, 2025.

142. National Rural Health Association. Bridging the Gap: Addressing Health Inequities in Rural Communities. Available at https://www.ruralhealth.us/blogs/2024/09/bridging-the-gap-addressing-health-inequities-in-rural-communities. Last accessed July 17, 2025.

143. National Conference of State Legislatures. State Policy Levers to Address Workforce Shortages. Available at https://documents.ncsl.org/wwwncsl/Health/2022-Rural-SE/SEnlund_37757.pdf. Last accessed July 17, 2025.

144. National Conference of State Legislatures. Improving Rural Health: State Policy Options for Increasing Access to Care. Available at https://www.ncsl.org/health/improving-rural-health. Last accessed July 17, 2025.

145. National Conference of State Legislatures. Facing Workforce Shortages, States Expand Authority of Health Professionals. Available at https://www.ncsl.org/state-legislatures-news/details/facing-workforce-shortages-states-expand-authority-of-health-professionals. Last accessed July 17, 2025.

146. WWAMI Rural Health Research Center. The Rural Health Workforce: Challenges and Opportunities. Available at http://depts.washington.edu/uwrhrc/uploads/RHRC_PB146-1.pdf. Last accessed July 17, 2025.

147. Rural Health Information Hub. Rural Healthcare Workforce. Available at https://www.ruralhealthinfo.org/topics/health-care-workforce#workforce. Last accessed July 17, 2025.

148. The Commonwealth Fund. Understanding the U.S. Behavioral Health Workforce Shortage. Available at https://www.commonwealthfund.org/publications/explainer/2023/may/understanding-us-behavioral-health-workforce-shortage#. Last accessed July 17, 2025.

149. HRSA Health Workforce. State of the Behavioral Health Workforce, 2024. Available at https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/state-of-the-behavioral-health-workforce-report-2024.pdf. Last accessed July 17, 2025.

150. Health Resources and Services Administration. Data Warehouse. Available at https://data.hrsa.gov. Last accessed July 17, 2025.

151. Health Resources and Services Administration. Nurse Workforce Projections, 2022-2037. Available at https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/nursing-projections-factsheet.pdf. Last accessed July 17, 2025.

152. Health Resources and Services Administration. The Future of the Nursing Workforce: National- and State-Level Projections, 2012–2025. Available at https://www.njccn.org/wp-content/uploads/2015/07/The-Future-of-the-Nursing-Workforce-Nationa-and-State-Level-Projections-2012-2025.pdf. Last accessed July 17, 2025.

153. U.S. Health Resources and Services Administration. Health Workforce Shortage Areas. Available at https://data.hrsa.gov/topics/health-workforce/shortage-areas. Last accessed July 17, 2025.

154. HRSA Health Workforce. State of the U.S. Health Care Workforce, 2024. Available at https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/state-of-the-health-workforce-report-2024.pdf. Last accessed July 17, 2025.

155. HRSA Health Workforce. Physician Workforce: Projections, 2022-2037. Available at https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/physicians-projections-factsheet.pdf. Last accessed July 17, 2025.

156. HRSA Health Workforce. State of the Primary Care Workforce, 2024. Available at https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/state-of-the-primary-care-workforce-report-2024.pdf. Last accessed July 17, 2025.

157. RUPRI Center for Rural Health Policy Analysis: Data Brief. Changes in Rural Pharmacy Presence 2023. Available at https://rupri.public-health.uiowa.edu/publications/policybriefs/2024/Rural_Pharmacy_Presence.pdf. Last accessed July 17, 2025.

158. U.S. Department of Health and Human Services. Workforce Projections. Available at https://data.hrsa.gov/topics/health-workforce/workforce-projections. Last accessed July 17, 2025.

159. HRSA Health Workforce. Allied Health Workforce Projections, 2016-2030: Pharmacists. Available at https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/pharmacists-2016-2030.pdf. Last accessed July 17, 2025.

160. Rural Health Information Hub. Rural Pharmacy and Prescription Drugs. Available at https://www.ruralhealthinfo.org/topics/pharmacy-and-prescription-drugs. Last accessed July 17, 2025.

161. HealthIT.gov. Emergency Medical Services and Emergency Preparedness. Available at https://www.healthit.gov/topic/health-it-health-care-settings/emergency-medical-services-emergency-preparedness. Last accessed July 17, 2025.

162. Nebraska Rural Health Advisory Commission. Nebraska Rural Health Advisory Commission's Rural Health Recommendations. Available at https://dhhs.ne.gov/RH%20Advisory%20Commission/RHAC%27s%20Recommendations%202021.pdf. Last accessed July 17, 2025.

163. National Rural Health Association Policy Paper. EMS Services in Rural America: Challenges and Opportunities. Available at https://www.ruralhealth.us/getmedia/cc0078fa-14d2-47eb-98a6-2bb6722e540c/2019-NRHA-Policy-Document-EMS-Services-in-Rural-America-Challenges-and-Opportunities.pdf. Last accessed July 17, 2025.

164. Centers for Disease Control and Prevention. Arthritis. Available at https://www.cdc.gov/cdi/indicator-definitions/arthritis.html. Last accessed July 17, 2025.

165. WWAMI Rural Health Research Center. Prehospital Emergency Medical Services Personnel in Rural Areas: Results from a Survey in Nine States. Available at http://depts.washington.edu/uwrhrc/uploads/RHRC_FR149_Patterson.pdf. Last accessed July 17, 2025.

166. National Rural Health Association Policy Paper. Improving Rural Oral Healthcare Access. Available at https://www.ruralhealth.us/getmedia/18fdb3a0-3483-4a9c-833d-5b3545ab9ff7/2019-NRHA-Policy-Document-Improving-Rural-Oral-Healthcare-Access.pdf. Last accessed July 17, 2025.

167. Rural Health Information Hub. Oral Health in Rural Communities. Available at https://www.ruralhealthinfo.org/topics/oral-health#sufficient-workforce. Last accessed July 17, 2025.

168. Koppelman J. States Expand the Use of Dental Therapy. Available at https://www.pew.org/en/research-and-analysis/articles/2016/09/28/states-expand-the-use-of-dental-therapy. Last accessed July 17, 2025.

169. Rural Health Information Hub. Rural Public Health Agencies. Available at https://www.ruralhealthinfo.org/topics/public-health. Last accessed July 17, 2025.

170. Centers for Disease Control and Prevention. About Public Health Workforce Development. Available at https://www.cdc.gov/workforce/php/about/index.html. Last accessed July 17, 2025.

171. U.S. Department of Agriculture. About RD. Available at https://www.rd.usda.gov/about-rd. Last accessed July 17, 2025.

172. Association of State and Territorial Health Officials. Profile of State and Territorial Public Health. Available at https://astho.shinyapps.io/profile/. Last accessed July 17, 2025.

173. Office of Disease Prevention and Health Promotion. NALBOH Resources. Available at https://www.nalboh.org/page/Governance. Last accessed July 17, 2025.

174. Health Resources and Services Administration. What is a Health Center? Available at https://bphc.hrsa.gov/about-health-centers/what-health-center. Last accessed July 17, 2025.

175. National Association of Community Health Centers. What is a Community Health Center? Available at https://www.nachc.org/community-health-centers/what-is-a-health-center/. Last accessed July 17, 2025.

176. U.S. Health Resources and Services Administration. Health Center Program: Impact and Growth. Available at https://bphc.hrsa.gov/about-health-centers/health-center-program-impact-growth. Last accessed July 17, 2025.

177. National Academy for State Health Policy. Community Health Centers and State Health Policy: A Primer for Policymakers. Available at https://eadn-wc03-6094147.nxedge.io/cdn/wp-content/uploads/sites/default/files/chc.primer.2012.2.pdf. Last accessed July 17, 2025.

178. National Rural Health Association Policy Brief. Responsive Rural Health Delivery Systems. Available at https://www.ruralhealth.us/getmedia/5d8218c3-4cda-4c15-a75e-4f2a394a9a96/NRHAResponsiveRuralHealthDeliverySystemsPolicyPaperFeb2016.pdf. Last accessed July 17, 2025.

179. Indian Health Service. Disparities. Available at https://www.ihs.gov/newsroom/factsheets/disparities. Last accessed July 17, 2025.

180. Indian Health Service. The Oral Health of American Indian and Alaska Native Children Aged 6–9 Years: Results of the 2016–2017 IHS Oral Health Survey. Available at https://www.ihs.gov/doh/documents/Data%20Brief%20IHS%206-9%20Year%20Olds%2003-30-2017.pdf. Last accessed July 17, 2025.

181. Indian Health Service. About IHS. Available at https://www.ihs.gov/aboutihs. Last accessed July 17, 2025.
182. Indian Health Service Strategic Plan: Fiscal Years 2025-2029. Available at https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/2024_Letters/Enclosure_DTLL_DUIOLL_100124.pdf. Last accessed July 17, 2025.
183. Indian Health Service: A Quick Look. Available at https://www.ihs.gov/sites/newsroom/themes/responsive2017/display_objects/documents/factsheets/QuickLook.pdf. Last accessed July 17, 2025.
184. Indian Health Service. Indian Health Manual. Available at https://www.ihs.gov/ihm. Last accessed July 17, 2025.
185. Indian Health Service. Special Diabetes Program for Indians. Available at https://www.ihs.gov/sdpi. Last accessed July 17, 2025.
186. Indian Health Service. HIS Early Childhood Caries Collaborative. Available at https://www.ihs.gov/doh/index.cfm?fuseaction=ecc.display. Last accessed July 17, 2025.
187. Indian Health Service. The Public Health Nurse's Role in ECC Prevention and Early Intervention. Available at https://www.ihs.gov/doh/documents/ecc/CommunityDocs/PHNRoleECCPreventionAndEarlyIntervention.pdf. Last accessed July 17, 2025.
188. Indian Health Service. Alcohol and Substance Abuse Branch. Available at https://www.ihs.gov/asab/. Last accessed July 17, 2025.
189. Indian Health Service. Substance Abuse and Suicide Prevention (SASP) Program. Available at https://www.ihs.gov/sasp/. Last accessed July 17, 2025.
190. Indian Health Service. Youth Regional Treatment Centers (YRTCs). Available at https://www.ihs.gov/yrtc/treatment. Last accessed July 17, 2025.
191. Indian Health Service. IHS Partnerships. Available at https://www.ihs.gov/newsroom/factsheets/ihspartnerships. Last accessed July 17, 2025.
192. Indian Health Service. About Us. Available at https://www.ihs.gov/chr/aboutus/. Last accessed July 17, 2025.
193. Indian Health Service. Community Health Representative. Available at https://www.ihs.gov/chr/. Last accessed July 17, 2025.
194. Indian Health Service. Our Employees. Available at https://www.ihs.gov/aboutihs/ouremployees/#. Last accessed July 17, 2025.
195. U.S. Department of Agriculture. Collaborating for Prosperity with American Indians and Alaska Natives: Programs for Tribal Families, Children, and Communities. Available at https://www.nal.usda.gov/exhibits/ipd/ruralusa/exhibits/show/housing/item/28. Last accessed July 17, 2025.
196. Indian Health Service. Safe Water and Waste Disposal Facilities. Available at https://www.ihs.gov/newsroom/factsheets/safewater. Last accessed July 17, 2025.
197. Indian Health Service. Recognizing the 60th Anniversary of the Indian Sanitation Facilities Act. Available at https://www.ihs.gov/newsroom/ihs-blog/july2019/recognizing-the-60th-anniversary-of-the-indian-sanitation-facilities-act/. Last accessed July 17, 2025.
198. USDA Rural Development. Telecom Programs. Available at https://www.rd.usda.gov/programs-services/telecommunications-programs. Last accessed July 17, 2025.
199. National Conference of State Legislatures. Health Care 2017. Available at https://documents.ncsl.org/wwwncsl/Health/HealthDisparities_2017_31448%20(1).pdf?. Last accessed July 17, 2025.
200. U.S. Department of Health and Human Services, Office of Minority Health. American Indian/Alaska Native Health. Available at https://minorityhealth.hhs.gov/american-indianalaska-native-health. Last accessed July 17, 2025.
201. Edgerly C. Odawa Indian Tribe Brings Healthy Foods to Rural Michigan. Available at https://www.cdc.gov/reach/media/pdfs/2025/02/Odawa-Indian-Tribe-Brings-Healthy-Foods-to-Rural-Michigan-REACH-2017-508.pdf. Last accessed July 17, 2025.
202. Partners in Health. Navajo Nation. Available at https://www.pih.org/country/navajo-nation. Last accessed July 17, 2025.
203. Tsosie M. Navajo Families in New Mexico Now Enjoy a Healthy Dose of New Produce Options. Available at https://www.cdc.gov/reach/media/pdfs/2025/02/Navajo-Families-in-New-Mexico-Now-Enjoy-a-Healthy-Dose-of-New-Produce-Options-REACH-2016-508.pdf. Last accessed July 17, 2025.
204. Brownotter C. Navajo Youth Lead the Way to Healthier Lives in Arizona, Utah, and New Mexico. Available at https://www.cdc.gov/reach/media/pdfs/2025/02/Navajo-Youth-Lead-the-Way-to-Healthier-Lives-in-Arizona-Utah-and-New-Mexico-REACH-2018-508.pdf. Last accessed July 17, 2025.
205. Alzheimers.org. 2025 Alzheimer's Disease Facts and Figures. Available at https://www.alz.org/getmedia/ef8f48f9-ad36-48ea-87f9-b74034635c1e/alzheimers-facts-and-figures.pdf. Last accessed July 17, 2025.
206. Administration for Community Living. 2023 Profile of Older Americans. Available at https://acl.gov/sites/default/files/Profile%20of%20OA/ACL_ProfileOlderAmericans2023_508.pdf. Last accessed July 17, 2025.
207. Older Americans Act of 1965, Public L No. 89-73.
208. Administration for Community Living. Nutrition Services. Available at https://acl.gov/programs/health-wellness/nutrition-services. Last accessed July 17, 2025.
209. Administration for Community Living. Older Americans Act. Available at https://acl.gov/about-acl/authorizing-statutes/older-americans-act. Last accessed July 17, 2025.
210. National Prevention, Health Promotion, and Public Health Council. Healthy Aging in Action. Advancing the National Prevention Strategy. Available at https://www.hhs.gov/sites/default/files/healthy-aging-in-action-final.pdf. Last accessed July 17, 2025.

211. National Rural Health Association Policy Brief. Elder Health in Rural America. Available at https://www.ruralhealth.us/getmedia/cff14e89-9472-4511-9242-f22f35505794/ElderHealthinRuralAmericaFeb2013.pdf. Last accessed July 17, 2025.

212. Schmeida M, McNeal R. Medicaid long-term care spending. In: Information Resources Management Association (ed). *Chronic Illness and Long-Term Care: Breakthroughs in Research and Practice*. Hershey, PA: IGI Global; 2019: 821-845.

213. Rural Health Information Hub. Rural Home Health Services. Available at https://www.ruralhealthinfo.org/topics/home-health. Last accessed July 17, 2025.

214. Healthy People 2030. Health Policy. Available at https://health.gov/healthypeople/objectives-and-data/browse-objectives/health-policy. Last accessed July 17, 2025.

215. Rural Health Information Hub. Rural Hunger and Access to Healthy Food. Available at https://www.ruralhealthinfo.org/topics/food-and-hunger. Last accessed July 17, 2025.

216. U.S. Department of Agriculture Economic Research Service. Household Food Security in the United States in 2020. Available at https://ers.usda.gov/sites/default/files/_laserfiche/publications/102076/ERR-298.pdf?v=49881. Last accessed July 17, 2025.

217. Centers for Disease Control and Prevention. Older Adults: Addig Activity Recommendations. Available at https://www.cdc.gov/physical-activity-basics/adding-older-adults/. Last accessed July 17, 2025.

218. Centers for Disease Control and Prevention. Dementia Caregiving as a Public Health Strategy. Available at https://www.cdc.gov/caregiving/php/public-health-strategy/index.html. Last accessed July 17, 2025.

219. Centers for Disease Control and Prevention. Alzheimer's Disease and Healthy Aging Portal. Available at https://www.cdc.gov/healthy-aging-data/data-portal/index.html. Last accessed July 17, 2025.

220. Rural Health Information Hub. The Most Costly Chronic Medical Condition in America: Experts Talk About the Rural Aspect of Alzheimer's Disease and Related Dementias. Available at https://www.ruralhealthinfo.org/rural-monitor/dementia. Last accessed July 17, 2025.

221. Santo L, Schappert SM, Ward BW. *Emergency Department Visits By Adults Age 65 and Older With Alzheimer Disease: United States, 2020-2022*. NCHS Data Brief, no 510. Hyattsville, MD: National Center for Health Statistics; 2024.

222. Centers for Disease Control and Prevention. Caregivers of a Person with Alzheimer's Disease or a Related Dementia. Available at https://www.cdc.gov/caregiving/about/. Last accessed July 17, 2025.

223. Centers for Disease Control and Prevention. BOLD Infrastructure for Alzheimer's Act. Available at https://www.cdc.gov/aging-programs/php/bold/. Last accessed July 17, 2025.

224. Centers for Disease Control and Prevention. National Healthy Brain Initiative State and Local Road Map. Available at https://www.cdc.gov/aging-programs/php/nhbi/roadmap.html. Last accessed July 17, 2025.

225. Rural Information Hub. HealthStreet Cognitive Screening Project. Available at https://www.ruralhealthinfo.org/project-examples/1082. Last accessed July 17, 2025.

226. Rural Information Hub. The Most Costly Chronic Medical Condition in America: Experts Talk About the Rural Aspects of Alzheimer's Disease and Related Dementias. Available at https://www.ruralhealthinfo.org/rural-monitor/dementia. Last accessed July 17, 2025.

227. Centers for Disease Control and Prevention. Vital Signs: Preventing 1 Million Heart Attacks and Strokes [Archive]. Available at https://archive.cdc.gov/#/details?url=https://www.cdc.gov/vitalsigns/million-hearts/index.html. Last accessed July 17, 2025.

228. National Center for Chronic Disease Prevention and Health Promotion. About Us. Available at https://www.cdc.gov/nccdphp/about/index.html. Last accessed July 17, 2025.

229. Centers for Disease Control and Prevention. *Principles of Epidemiology in Public Health Practice: An Introduction to Applied Epidemiology and Biostatistics*. 3rd ed. Atlanta, GA: U.S. Department of Health and Human Services; 2006.

230. Centers for Disease Control and Prevention. Evidence-Based Guides for States. Best Practices for Comprehensive Tobacco Control Programs: 2014. Available at https://www.cdc.gov/tobacco/php/state-and-community-work/guides-for-states.html#cdc_generic_section_1-best-practices-for-tobacco-control-programs. Last accessed July 17, 2025.

231. Office of the National Coordinator for Health Information Technology. Connecting Public Health Information Systems and Health Information Exchange Organizations. Available at https://www.healthit.gov/sites/default/files/FINAL_ONC_PH_HIE_090122017.pdf. Last accessed July 17, 2025.

232. Holt JB, Huston SL, Heidari K, et al. Indicators for chronic disease surveillance—United States, 2013. *MMWR*. 2015;64(RR1):1-15.

233. Centers for Disease Control and Prevention. Foodborne Disease Outbreak Surveillance System. Available at https://www.cdc.gov/nors/about/fdoss.html. Last accessed July 17, 2025.

234. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Available at https://www.cdc.gov/brfss/index.html. Last accessed July 17, 2025.

235. Centers for Disease Control and Prevention. National Center for Environmental Health. Available at https://www.cdc.gov/nceh/index.html. Last accessed July 17, 2025.

236. Prosch N. South Dakota's Workplace Wellness Program Gets Employees Moving at Work. Available at https://www.cdc.gov/physical-activity/media/pdfs/2025/02/South-Dakotas-Workplace-Wellness-Program-Gets-Employees-Moving-at-Work-NOFO-1803-2016-508.pdf. Last accessed July 17, 2025.

237. Johnson T. Reducing the Prevalence and Costs of Heart Disease. NCSL *Legisbrief*. 2015;23(13):1-2.

238. Costakis C. Montana Cities and Counties Working to Build Health into Community Design. Available at https://stacks.cdc.gov/pdfjs/web/viewer.html?file=https://stacks.cdc.gov/view/cdc/79328/cdc_79328_DS1.pdf. Last accessed July 17, 2025.

239. Utah Foundation. Healthy Communities: Advancing Wellness and Safety. Available at https://www.utahfoundation.org/reports/healthy-communities-advancing-wellness-and-safety/. Last accessed July 17, 2025.

240. Centers for Disease Control and Prevention. State Indicator Report on Fruits and Vegetables, 2018. Available at https://www.cdc.gov/nutrition/php/data-research/fruits-vegetables.html?CDC_AAref_Val=https://www.cdc.gov/nutrition/data-statistics/2018-state-indicator-report-fruits-vegetables.html. Last accessed July 17, 2025.

241. HealthIT.gov. Benefits of EHRs. Available at https://www.healthit.gov/topic/health-it-basics/benefits-ehrs. Last accessed July 17, 2025.

242. HealthIT.gov. What Are Electronic Health Records (EHRs)? Available at https://www.healthit.gov/topic/health-it-and-health-information-exchange-basics/what-are-electronic-health-records-ehrs. Last accessed July 17, 2025.

243. National Conference of State Legislatures. Health Disparities Legislation. Available at https://www.ncsl.org/health/health-disparities-legislation. Last accessed July 17, 2025.

244. Centers for Disease Control and Prevention. Colorectal Cancer Control Program. Award Recipient Highlights. Available at https://www.cdc.gov/colorectal-cancer-control/about/award-recipient-highlights.html. Last accessed July 17, 2025.

245. Centers for Disease Control and Prevention. Making Alzheimer's Our Next Public Health Success Story [Archive]. Available at https://stacks.cdc.gov/view/cdc/57843. Last accessed July 17, 2025.

246. Health Resources and Services Administration. About HRSA. Available at https://www.hrsa.gov/about. Last accessed July 17, 2025.

247. Health Resources and Services Administration. 2019-2022 Strategic Plan: Goal 2: Foster a Health Care Workforce Able to Address Current and Emerging Needs. Available at https://www.matrc.org/wp-content/uploads/2023/09/HRSA-strategic-plan-2019-2022.pdf. Last accessed July 17, 2025.

248. Alabama Board of Nursing. Administrative Code Chapter 610-X-12: Loan Repayment Program for Advanced Practice Nursing. Available at https://admincode.legislature.state.al.us/api/chapter/610-X-12. Last accessed July 17, 2025.

249. WVU Institute for Community and Rural Health. State Loan Repayment Program (SLRP). Available at https://hsc.wvu.edu/rural-health/financial-incentives/state-loan-repayment-program-slrp/. Last accessed July 17, 2025.

250. Agency for Healthcare Research and Quality. Telehealth: Mapping the Evidence for Patient Outcomes from Systematic Reviews. Available at https://effectivehealthcare.ahrq.gov/sites/default/files/pdf/telehealth_technical-brief.pdf. Last accessed July 17, 2025.

251. Federal Communications Commission. FCC Health IT Actions and Activities Timeline. Available at https://www.fcc.gov/general/fcc-health-it-actions-and-activities-timeline. Last accessed July 17, 2025.

252. HRSA Office for the Advancement of Telehealth. What is Telehealth? Available at https://www.hrsa.gov/telehealth/what-is-telehealth. Last accessed July 17, 2025.

253. American Telemedicine Association. ATA's Standardized Telehealth Terminology and Policy Language for States on Medical Practice. Available at https://www.americantelemed.org/wp-content/uploads/2020/10/ATA-_Medical-Practice-10-5-20.pdf. Last accessed July 17, 2025.

254. U.S. Congress. Rural Health Care Improvement Act of 2001. Available at https://www.congress.gov/bill/107th-congress/house-bill/2157/titles. Last accessed July 17, 2025.

255. Kreimer S. Interstate Telehealth Visits in Jeopardy as Pandemic Licensure Waivers Expire. Available at https://www.fiercehealthcare.com/health-tech/interstate-telehealth-visits-jeopardy-pandemic-licensure-waivers-expire. Last accessed July 17, 2025.

256. Telehealth.HHS.gov. Licensing Across State Lines. Available at https://telehealth.hhs.gov/licensure/licensing-across-state-lines. Last accessed July 17, 2025.

257. Harris J, Hartnett T, Hoagland WG, McDonough D, Serafini M. What Eliminating Barriers to Interstate Telehealth Taught Us During the Pandemic. Available at https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2021/11/BPC-Health-Licensure-Brief_WEB.pdf. Last accessed July 17, 2025.

258. Federal Communications Commission. Eight Broadband Profress Report. Available at https://www.fcc.gov/reports-research/reports/broadband-progress-reports/eighth-broadband-progress-report#. Last accessed July 17, 2025.

259. National Telecommunications and Information Administration. Switched Off: Why Are One in Five U.S. Households Not Online? Available at https://www.ntia.gov/blog/2022/switched-why-are-one-five-us-households-not-online. Last accessed July 17, 2025.

260. Patel SY, Mehrotra A. The Surge of Telehealth During the Pandemic is Exacerbating Urban-Rural Disparities in Access to Mental Health Care. Available at https://www.healthaffairs.org/content/forefront/surge-telehealth-during-pandemic-exacerbating-urban-rural-disparities-access-mental. Last accessed July 17, 2025.

261. Grieco-Page H, Black CJ, Berent JM, Gautam B. Beyond the pandemic: leveraging rapid expansions in U.S. telemental health and digital platforms to address disparities and resolve the digital divide. *Front Psychiatry*. 2021;12:671502.

262. Rural Health Information Hub. Telehealth Models for Increasing Access to Pharmacy Services. Available at https://www.ruralhealthinfo.org/toolkits/telehealth/2/care-delivery/pharmacy-services. Last accessed July 17, 2025.

263. Pathak S, Haynes M, Qato D, et al. Telepharmacy and quality of medication use in rural areas, 2013-2019. *Prev Chronic Dis*. 2020;17:200012.

264. Schmeida M, McNeal R. Bridging the inequality gap to accessing Medicare and Medicaid information online: an empirical analysis of e-government success 2002 through 2010. In: García G Jr (ed). *E-Government Success Around the World: Cases, Empirical Studies, and Practical Recommendations*. Hershey, PA: Information Science Reference; 2013: 60-78.

265. Centers for Disease Control and Prevention. Strengthening Global Public Health Surveillance Through Data and Benefit Sharing. Available at https://wwwnc.cdc.gov/eid/article/24/7/15-1830_article. Last accessed July 17, 2025.

266. Nevada Cancer Coalition. Nevada's Teen Vaping Campaign Strives to Keep Kids Vape-Free. Available at https://www.nevadacancercoalition.org/blog/nevadas-teen-vaping-campaign-strives-keep-kids-vape-free. Last accessed July 17, 2025.

267. Galoustian G. Nursing 2025: No Relief as Burnout, Stress and Staffing Woes Persist. Available at https://www.fau.edu/newsdesk/articles/beyond-the-bedside-nursing-survey.php#. Last accessed July 17, 2025.

268. Substance Abuse and Mental Health Services Administration. Addressing Burnout in the Behavioral Health Workforce Through Organizational Strategies. Available at https://library.samhsa.gov/sites/default/files/pep22-06-02-005.pdf. Last accessed July 17, 2025.

269. ASHP News Center. Survey Finds High Burnout Among Pharmacists, Support for Workplace Wellness Efforts. Available at https://news.ashp.org/news/meetingnews/2023/04/03/survey-finds-high-burnout-among-pharmacists-support-for-workplace-wellness-efforts. Last accessed July 17, 2025.

270. Nigam JAS, Barker M, Cunningham TR, Swanson NG, Chosewood LC. Vital Signs: health worker-perceived working conditions and symptoms of poor mental health-quality ofw roklife survey, United States, 2018-2022. *MMWR*. 2023;72(44):1197-1205.

271. Nurse Training Act of 1964, Public L No. 88-581, 58 Stat 682.

272. Nurse Reinvestment Act, Public L No. 107-205.

273. Health Professions Education Partnerships Act of 1998, Public L No. 105-392, 112 Stat 3524.

274. Congressional Research Service. Nursing Workforce Programs in Title VIII of the Public Health Service Act. Available at https://www.everycrsreport.com/reports/RL32805.html. Last accessed July 17, 2025.

275. Rural Health Information Hub. Recruitment and Retention for Rural Health Facilities. Available at https://www.ruralhealthinfo.org/topics/rural-health-recruitment-retention. Last accessed July 17, 2025.

276. Danso R. Cultural competence and cultural humility: a critical reflection on key cultural diversity concepts. *J Soc Work*. 2018;18(4):410-430.

277. Horvat L, Horey D, Romios P, Kis-Rigo J. Cultural competence education for health professionals. *Cochrane Database Syst Rev*. 2014;5(5):CD009405.

278. Campinha-Bacote J. The process of cultural competence in the delivery of healthcare services: a model of care. *J Transcultural Nurs*. 2002;13(3):181-184.

279. Advisory Committee on Interdisciplinary, Community-Based Linkages. Redesigning Health Professions Education and Practice to Prepare the Interprofessional Team to Care for Populations: Twelfth Annual Report to the Secretary of the United States Department of Health and Human Services. Available at https://www.hrsa.gov/sites/default/files/hrsa/advisory-committees/community-based-linkages/reports/twelfth-2013.pdf. Last accessed July 17, 2025.

280. USA.gov. Get Started Repaying Your Federal Student Loan. Available at https://www.nasn.org/nasn-resources/framework. Last accessed July 17, 2025.

281. Health Resources and Services Administration. Nurse Corps Loan Repayment Program. Available at https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/funding/nursecorps-lrp-guidance.pdf. Last accessed July 17, 2025.

282. HRSA. Loan Repayment Programs for Health Careers. Available at https://bhw.hrsa.gov/funding/apply-loan-repayment. Last accessed July 17, 2025.

283. Barnes H, Richards MR, McHugh MD, Martsolf G. Rural and nonrural primary care physician practices increasingly rely on nurse practitioners. *Health Affairs (Project Hope)*. 2018;37(6):9081914.

284. Minnesota Department of Health. Emerging Health Professions. Available at https://www.health.state.mn.us/facilities/ruralhealth/emerging/index.html. Last accessed July 17, 2025.

285. AAPA. Pas in Rural Locations Ready to Meet Primary Care Needs. Available at https://www.aapa.org/news-central/2018/06/pas-rural-locations-ready-meet-primary-care-needs/#. Last accessed July 17, 2025.

286. American Association of Nurse Practitioners. State Practice Environment. Available at https://www.aanp.org/advocacy/state/state-practice-environment. Last accessed July 17, 2025.

287. Block L, Tocher S, Chhean E, Cardwell. State Strategies to Support the Future of the Primary Care Physician and Nursing Workforce. Available at https://nashp.org/state-strategies-to-support-the-future-of-the-primary-care-physician-and-nursing-workforce/. Last accessed July 17, 2025.

288. PEW Charitable Trusts. Expanding the Dental Team Increasing Access to Care in Public Settings. Available at https://www.pewtrusts.org/en/research-and-analysis/reports/2014/06/30/expanding-the-dental-team. Last accessed July 17, 2025.

289. Scott DM. Assessment of pharmacists' perception of patient care competence and need for training in rural and urban areas in North Dakota. *J Rural Health.* 2010;26(1):90-96.

290. Radford A, Richardson I, Mason M, Rutledge S. The Key Role of Sole Community Pharmacists in Their Local Healthcare Delivery Systems. Available at https://www.shepscenter.unc.edu/wp-content/uploads/2014/10/FB88.pdf. Last accessed July 17, 2025.

291. Washington Workforce Training and Education Coordinating Board. 2022 Behavioral Health Workforce Assessment: A Report of the Behavioral Health Workforce Advisory Committee. Available at https://wtb.wa.gov/wp-content/uploads/2022/12/BHWAC-2022-report_FINAL.pdf. Last accessed July 17, 2025.

292. American Public Health Association. Support for Community Health Workers to Increase Health Access and to Reduce Health Inequities. Available at https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/09/14/19/support-for-community-health-workers-to-increase-health-access-and-to-reduce-health-inequities. Last accessed July 17, 2025.

293. National Conference of State Legislatures. Incorporating Community Health Workers into State Health Care Systems: Options for Policymakers. Available at https://azprc.arizona.edu/sites/default/files/national-conference-state-legislators-chwbrief.pdf. Last accessed July 17, 2025.

294. U.S. Department of Labor Bureau of Labor Statistics. Occupational Employment Statistics, Occupational Employment and Wages, May 2024. Available at https://www.bls.gov/oes/tables.htm. Last accessed July 17, 2025.

295. Centers for Disease Control and Prevention. About Public Health Workforce Development. Available at https://www.cdc.gov/workforce/php/about/index.html. Last accessed July 17, 2025.

296. Healthy People 2030. Educational and Community-Based Programs Workgroup. Available at https://health.gov/healthypeople/about/workgroups/educational-and-community-based-programs-workgroup. Last accessed July 17, 2025.

297. Rural Health Information Hub. Rural Schools and Health. Available at https://www.ruralhealthinfo.org/topics/schools. Last accessed July 17, 2025.

298. National Center for Education Statistics. Public School Enrollment. Available at https://nces.ed.gov/programs/coe/indicator/cga. Last accessed July 17, 2025.

299. Centers for Disease Control and Prevention. Comprehensive School Physical Activity Programs: A Guide for Schools. Available at https://www.cdc.gov/healthyschools/professional_development/e-learning/CSPAP/_assets/FullCourseContent-CSPAP.pdf. Last accessed July 17, 2025.

300. Centers for Disease Control and Prevention. Improving Nutrition, Physical Education, and Physical Activity in Iowa Schools [Archive]. Available at https://archive.cdc.gov/#/details?url=https://www.cdc.gov/healthyschools/success-stories/iowa.htm. Last accessed July 17, 2025.

301. Centers for Disease Control and Prevention. Good and Healthy Project Improves Physical Activity and Nutrition in South Dakota Schools [Archive]. Available at https://archive.cdc.gov/#/details?url=https://www.cdc.gov/healthyschools/success-stories/south-dakota.htm. Last accessed July 17, 2025.

302. Grout R. Function of the school in the rural health program. *Am J Public Health Nations Health.* 1937;27(6):583-586.

303. National Association of School Nurses. School Nursing Practice Framework. Available at https://www.nasn.org/nasn-resources/framework. Last accessed July 17, 2025.

304. Centers for Disease Control and Prevention. Helping Young Children Thrive: Healthy Practices in the Early Care and Education (ECE) Setting [Archive]. Available at https://stacks.cdc.gov/view/cdc/177899. Last accessed July 17, 2025.

305. Centers for Disease Control and Prevention. Health Impact in 5 Years. Available at https://www.cdc.gov/policy/hi-5/index.html. Last accessed July 17, 2025.

306. Centers for Disease Control and Prevention. About Early Childcare and Education (ECE). Available at https://www.cdc.gov/early-care-education/about/?CDC_AAref_Val=https://www.cdc.gov/obesity/strategies/childcareece.html. Last accessed July 17, 2025.

307. Centers for Disease Control and Prevention. New Mexico Early Care and Education Centers Create Lasting Wellness Changes [Archive]. Available at https://stacks.cdc.gov/view/cdc/79181. Last accessed July 17, 2025.

308. Centers for Disease Control and Prevention. Healthy Schools. Available at https://www.cdc.gov/healthy-schools/about/?CDC_AAref_Val=https://www.cdc.gov/healthyschools/about.htm. Last accessed July 17, 2025.

309. Centers for Disease Control and Prevention. School Health Services. Available at https://www.cdc.gov/school-health-conditions/health-services/?CDC_AAref_Val=https://www.cdc.gov/healthyschools/schoolhealthservices.htm. Last accessed July 17, 2025.

310. Centers for Disease Control and Prevention. Whole School, Whole Community, Whole Child (WSCC). Available at https://www.cdc.gov/whole-school-community-child/about/. Last accessed July 17, 2025.

311. U.S. Census Bureau. Why We Ask Questions About... Language Spoken at Home. Available at https://www.census.gov/acs/www/about/why-we-ask-each-question/language. Last accessed July 17, 2025.

312. Karliner L, Napoles-Springer AM, Schillinger D, Bibbins-Domingo K, Pérez-Stable EJ. Identification of limited English proficient patients in clinical care. *J Gen Intern Med*. 2008;23(10):1555-1560.

313. Sevilla Matir J, Willis DR. Using bilingual staff members as interpreters. *Fam Pract Manage*. 2004;11(7):34-36.

314. Ngo-Metzger Q, Massagli MP, Clarridge BR, et al. Linguistic and cultural barriers to care: perspectives of Chinese and Vietnamese immigrants. *J Gen Intern Med*. 2003;18(1):44-52.

315. Flores G. Language barriers to health care in the United States. *N Engl J Med*. 2006;355(3):229-231.

316. Karliner L, Jacobs EA, Chen AH, Mutha S. Do professional interpreters improve clinical care for patients with limited English proficiency? A systematic review of the literature. *Health Serv Res*. 2007;42(2):727-754.

317. Flores G. The impact of medical interpreter services on the quality of health care: a systematic review. *Med Care Res Rev*. 2005;62(3): 255-299.

Evidence-based Practice Recommendations Citations

Roodenbeke E, Lucas S, Rouzaut A, Bana F. Outreach Services as a Strategy to Increase Access to Health Workers in Remote and Rural Areas: Increasing Access to Health Workers in Rural and Remote Areas. Available at https://apps.who.int/iris/bitstream/handle/10665/44589/9789241501514_eng.pdf. Last accessed July 18, 2025.

Roessel MH. Working With Indigenous/Native American Patients. Available at https://www.psychiatry.org/psychiatrists/diversity/education/best-practice-highlights/working-with-native-american-patients. Last accessed July 18, 2025.

World Health Organization. Increasing Access to Health Workers in Remote and Rural Areas Through Improved Retention: Global Policy Recommendations. Available at https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf. Last accessed July 18, 2025.