

# Rural Public Health and Nursing Care

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- Read the enclosed course.
- Complete the questions at the end of the course.
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## 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 more than 40 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 planner and director have disclosed no relevant financial relationship with any product manufacturer or service provider mentioned.

## Audience

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

## Accreditations & Approvals



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### **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.

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### **Disclosure Statement**

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### **Course Objective**

The purpose of this course is to provide nurses 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 nurse.
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 nursing workforce capacity.
16. Discuss schools and nurses as community health educators.



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.

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## INTRODUCTION

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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 nurses 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 nurse is evolving.

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## DEFINITIONS

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This section outlines both the role of the public health nurse and the vital services of public health to create a conceptual definition of the public health nurse. 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 NURSE

Public health nurses 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 nurses 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 National Rural Health Association states, “Given the broad and demanding scope of practice and the high level of autonomy that characterizes rural public health nursing, it is essential that these nurses have the strongest backgrounds and highest levels of competency” [1].

Abbreviated, the duties performed by public health nurses 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; 3]. The assessment skills of the public health nurse, in addition to their primary prevention focus and system-level perspectives, can “assure that local and state needs are met, services and programs are coordinated, and communities are engaged” [4].

Differing from acute care practice, the public health nurse aims to improve population health through prevention efforts and by attending to multiple determinants of health [4]. With a multi-level view of health, public health nursing action occurs through community applications of theory, evidence, and a commitment to health equity [4]. 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” [3].

According to the Association of Public Health Nurses, public health nursing is defined as “the practice of promoting and protecting the health of populations using knowledge from nursing, social, and public health sciences,” with a focus on “population health, with the goal of promoting health and preventing disease and disability” [5]. These nurses practice in public health departments, schools, homes, community-based health centers, clinics, correctional facilities, and other settings [5]. In some practices, the term public health nursing is interchanged with community health nursing.

## 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 [6]. It aims to promote physical and mental health, prevent disease, injury, and disability. The CDC has identified the following 10 vital services applied to all entities of public health—national, state, local, and tribes and territories [6]:

- Monitor the environmental health status in order to identify and resolve environmental health problems (e.g., community health assessment and registries).
- Diagnose and investigate environmental community health hazards, such as infectious water-, food-, and vector-borne disease outbreaks.
- Provide health education and health promotion, and empower people on environmental health issues.
- Mobilize community partnerships and actions with the private sector, civic groups, non-governmental organizations, faith communities, and other stakeholders toward resolving environmental health issues.
- Develop policies and conduct strategic and community health improvement planning that supports environmental health.
- Enforce laws and regulations, and review laws that protect environmental health and ensure community safety.
- Link people to needed health services and ensure the access to care when it is not available.
- Assure a competent public health workforce and leadership.

- Evaluate the effectiveness, accessibility, and quality of both personal- and population-based health services, and provide continuous quality improvement.
- Research new insights and innovative solutions to public health problems, and identify and share best practices.

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 [6; 7].

## 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 [8]. 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 [9].

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 [10]. 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 [10]. 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 [10]. 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 [10]. 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 [11]. 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 [8]. 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 [9].

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 [10]. 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 as open country and settlements with fewer than 2,500 residents [12]. As of 2020, the total population in nonmetro counties stood at 46.1 million [9; 18; 24]. 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 [9]. 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 [13].

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” [14].

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 [14]. 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 [14].

Frontier health professional shortage areas are also important to conceptualize. According to the U.S. Census Bureau, counties classified as frontier have a population density of fewer than seven people per square mile [15]. 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 [18]. 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 [19].

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## CHARACTERISTICS OF RURAL POPULATIONS

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According to the U.S. Census Bureau, and based on the 2016–2020 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; 78]. 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; 78]. 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 [21]. 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 [21].

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 2010 and 2017, 995 nonmetro counties recorded more deaths than births, resulting in a population loss of 284,000 from natural decrease in those counties [22]. 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, since 2010, the increase in rural population from natural change has not matched the decrease in population from net migration [23]. As a result, there is little or no population growth, with significant declines in some rural areas. This population loss is most widespread in the eastern portion of the United States [24]. The reasons for this rural population loss include mortality of the aged, the opioid epidemic, fewer births, reclassification of counties, and urban employment incentives.

## MIGRATION, EMPLOYMENT, AND ECONOMIC OPPORTUNITIES

Outmigration of young adults of childbearing age from rural areas has left an older population behind. In addition to deaths of the older population, younger adults who remain in rural areas have been significantly impacted by the opioid epidemic, with an increase in rural working-age adult mortality related to prescription opioid- and heroin-overdose deaths. Another reason for rural population loss is women having fewer children and couples postponing having children amid economic uncertainty.

Urbanization and the reclassification of counties from nonmetro to metro results in smaller rural areas that are characterized as slow-growing with more limited economic potential [24]. Limited economic opportunities for working-age adults can be an incentive to migrate out of rural areas to urban employment areas [24].

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 [22].

Rural civilian employment among persons 18 to 64 years of age is lower (67.6%) than that reported for urban residents (70%) [20]. Three major service industries together with manufacturing provide more than 70% of rural employment: education and health (25%); trade, transportation, and utilities (20%); and leisure and hospitality (11%). Manufacturing, farming, and mining have historically been the goods production focus for rural areas [24]. In 2009, rural employment was growing, although it has not yet fully recovered from the recession. According to the USDA, half of the observed decline in the unemployment rate since 2010 is due to a reduction in the size of the labor force, not an increase in employment, which is partly the result of little or no population growth in rural America [25]. Regardless, employment for rural America lags below the 2007 figures. This has been further complicated by the COVID-19 pandemic. By April 2020, mainly due to COVID-19 and related pressures, rural unemployment rates reached 13.6%, a level not seen since the 1930s. As of the end of 2021, unemployment rates among rural residents returned to pre-pandemic numbers, recovering more quickly than unemployment in metropolitan areas [24; 25].

## AGE AND RELATIONSHIP STATUS

Age is another determinant characterizing the rural population. As noted, the rural population is considered an older population than urban. Among adults, the median age for the rural person is 51 years, compared with 45 years in urban settings [20]. The marriage rate is significantly higher among rural residents (61.9%) than among urban residents (50.8%). Fewer rural people report living alone (11.6%) than urban people (14.3%) [20].

## POVERTY

Although some claim that rural America has a higher poverty rate compared with urban areas, U.S. Census Bureau data show that the urban poverty rate is higher than the rural rate [26; 78]. 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” [27]. Based on the American Community Survey, all four regions of the United States (Western, Midwestern, Southern, and Northeastern) showed consistently lower poverty rates in rural areas compared with urban areas [26; 78]. The poverty rate for rural adults is 15.4%, compared with 11.9% for urban adults. The poverty rate for rural children (younger than 18 years of age) is 18.9%, compared with 22.3% for urban children [20; 78]. In total, 42 states report lower poverty rates for their rural areas than for their urban areas [26].

The median household income for rural areas is \$52,386, while the median household income for urban areas is \$54,296 [20]. Rural household income is led by younger householders (44 years of age and younger) whereas urban median household income is greater for households led by an older householder (45 years of age and older). There are 32 states with greater median household incomes for rural households than for urban households [26]. Between 2007 and 2014, rural incomes were highest in rural recreation counties, and incomes were also high in the farming and mining counties [28]. Incomes were lowest in the government-dependent and non-specialized job category for rural counties; these counties have the highest rural poverty rates [28].

## EDUCATION

The chance of a rural person reporting a bachelor’s degree or higher (19.5%) is less than that for urban residents (29%) [20]. Between 2003 and 2014, rural household heads with a college degree showed an increase from 15.8% to 19.5%. This increase is reported as attributing to a lowering of poverty by 0.9% over the same period [29].

## INSURANCE COVERAGE

More adults in rural America have health insurance than urban adults, but the opposite is true for children in rural America. The uninsured rate for rural adults is 12.3%, compared with 10.1% for urban adults [79]. 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. Currently, U.S. Internet access is greater for urban areas than for rural. Based on 2019 survey data, 37.3% of rural residents have no access to moderate- or high-speed broadband in their homes, compared with 16.7% of urban residents [20].

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## RURAL POPULATION HEALTH

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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 [30].



## 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 [30]. 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 [31]. 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 [32; 33].

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 [34]. The percentages of deaths that were potentially preventable are higher in rural areas than in urban areas [34]. A considerable number of cases of premature heart and cerebrovascular disease in rural areas are preventable; potentially preventable rural deaths from stroke and heart disease were higher than for urban areas [34]. Risk factors for heart disease include hypertension, elevated low-density lipoprotein cholesterol, smoking, diabetes, obesity, and lifestyles characterized as sedentary with poor nutritional intake and high alcohol intake.

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 11,000 deaths reported in 2014 [34]. 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 public health nurses and all 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 house-keeping. 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 [35]. 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 [35].

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 [35]. 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 [53].

In collectivist cultures, one's identity is intertwined with the ill family member, and how the ill family member fares also affects the caregiver [54]. As such, interventions may target the patient and caregiver simultaneously [54].

### **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, over-protectiveness, 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 [82]. Furthermore, assuming a caregiving role for an elderly parent may resurrect previous developmental issues [55].

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 [56]. It assumes that the caregivers are experts and each member can help each other [57]. 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 [56]. 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 [58]. But a separate study found participation in distance or in-person psychoeducational groups was associated with improved caregiver distress and burden [59].

### **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; 60]. Trust is a key element for these types of groups [61].

### **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 [62]. 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 [62].

### **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%) [63]. 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 [63].

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 8.6% of rural adults use smokeless tobacco, compared with 6% of urban adults [63]. Rates of smokeless tobacco use are greatest in states with large rural areas: Wyoming, West Virginia, Mississippi, and Kentucky [64]. 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) [65]. 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 [66].

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 [67]. 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 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 [68].

SCOPE OF OBESITY AMONG ADULTS ACROSS THE UNITED STATES, 2020	
Percentage of Adult Population with Obesity	Corresponding States
20% to <25%	3 states and the District of Columbia
25% to <30%	11 states
30% to <35%	20 states plus Guam and Puerto Rico
≥35% to 38%	12 states
>38%	4 states (Mississippi, West Virginia, Alabama, and Louisiana)
Source: [71]	Table 1

## 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 [69]. 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 [69].

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 [70]. 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 [70].

As of 2020, there were 16 states in which the rate of adult obesity was greater than 35%, compared with 7 states in 2017 [71]. The top four states, with an obesity prevalence of greater than 38%, were Mississippi, West Virginia, Alabama, and Louisiana (*Table 1*). These states have significant rural populations [71]. 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 [34; 72]. 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 [72]. Certainly, mortality rates could be improved by ensuring adherence to screening guidelines and access to optimal care.

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) [73]. 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 [73].

## 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 [74]. 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 [74].

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 [75]. The rate of drug overdose deaths is greater in rural areas, with the rural overdose rate (unintentional injury) 50% higher than the urban rate [76]. Between 1999 and 2015, the rural opioid death rate quadrupled among those 18 to 25 years of age and tripled for women [76]. Socio-economic 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 [76]. 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 [77]. During the first half of 2012, treatment admissions for methamphetamine use were highest in Hawaii and San Diego, second highest in San Francisco, and third highest in Denver and Phoenix [80]. The higher use of methamphetamine in Western states is also reflected by the number of persons under its influence who come into contact with law enforcement.

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 [82]. Case management and behavioral contracting have also been identified as useful approaches to engage and maintain rural residents in therapy [83]. 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 [83]. Other possible approaches in the treatment of rural substance use disorder include treatment of jail and prison inmates and the use of drug courts [83].

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 are giving 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 [84]. 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) [85].

### **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 [86]. The means or method used for self-directed violence varies across geographic areas and across age groups [87; 88]. 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 [86; 87]. However, mental illness, particularly major depression, can be a risk factor [86].

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 [86; 87; 160]. While White men are at highest risk for suicide nationally, in rural areas American Indians/Alaska Natives (AI/ANs) are the most affected [86; 87]. 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 2019 suggest that 1 in 60 individuals (5.4 million) in the United States are survivors of suicide loss. Additionally, an average of 135 individuals (6.9 million annually) are exposed to or affected by each suicide death [97; 98].

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 time-frame 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 [98].

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 [97; 98].

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 [98]. 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 [99]. 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) [96]. 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 [96; 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/transportationsafety/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 6 million veterans reside in rural (nonmetropolitan) America [111; 123]. 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].

Despite being more likely to report physical and mental illness, rural veterans are less likely to use the U.S. Department of Veterans Affairs (VA) or public health care [112]. Only 38% of rural veterans live within a 30-minute drive of a VA facility, and only 49% of highly rural veterans live within 60 minutes. As such, the VA may partner with federally qualified health centers to provide care to veterans who live outside of a designated care area [112].

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 [113]. 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 [114]. 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 [115]. 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 [116; 117; 265].

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 [116; 265].

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 22% of all deaths from suicide in the United States are in military war veterans [118]. In addition, 12% of all U.S. Army suicides occur within 12 months of hospital discharge [119]. Despite preventive measures taken by the military, the number of suicides in this population continues to increase [120; 121; 122; 123; 124]. 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 [125; 126].

The VA defines military sexual trauma as “sexual assault or repeated, threatening sexual harassment that occurred while the veteran was in the military” [127]. This can include rape (nonconsenting, forced, or coerced sexual activity); unwanted sexual touching or grabbing; threatening, offensive remarks about a person’s body or sexual activities; and/or threatening or unwelcome sexual advances [127]. In 2020, the Department of Defense received 6,290 reports of sexual assault involving service members [128]. 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 [129].

Intermittent explosive disorder is included under the general category of disruptive, impulse-control, and conduct disorders in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* [130]. 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 [131].

## 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 [132]:

- 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 [15]. 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; 133].


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 [134]. 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 [34]. 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 [134]. 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 [134].

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 U.S. Department of Health and Human Services, broadband infrastructure is not accessible in all regions and can be as much as three times more costly in rural areas [135; 136]. 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 [135; 136].



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](https://apps.who.int/iris/bitstream/handle/10665/44589/9789241501514_eng.pdf).  
Last accessed July 21, 2022.)

**Level of Evidence:** Expert Opinion/Consensus Statement

Prevention programs are key to public health, but rural residents have less access to these programs [33; 137]. The National Rural Health Association states, “despite the initiation of effective health programs by rural health departments to improve community-level health behaviors, many more rural areas lack the public health agencies, personnel, and financial resources required to implement these interven-

tions” [2]. 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 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 [138]. There is a growing momentum to move beyond disease management and toward disease prevention and population health in rural communities [138].

### 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 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 [261].

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.

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## CHARACTERISTICS OF THE RURAL HEALTHCARE SYSTEM

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### 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 [2].

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 [139; 140]. This disparity is expected to grow as a result of demographic changes, insurance coverage expansions, and a decline in the primary care physician workforce [124; 141]. 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 [142; 143].

Rural counties are also historically disadvantaged in terms of mental health services [136]. According to the CDC, more than 85 million Americans live in areas with an insufficient number of mental health providers; this shortage is particularly severe among low-income rural communities [86]. Rural Americans with mental health needs typically enter care later, have more serious symptoms, and require more costly and intensive treatment [141]. 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 [144]. 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) [144]. About 7,970 primary care health professional shortage areas exist in the United States, with 65% located in rural areas [145]. These medically underserved areas are more likely to see unfavorable clinical outcomes.



HEALTHCARE WORKFORCE IN RURAL VS. URBAN AREAS, 2017–2018		
Profession	Rate in Urban Areas (Per 100,000 Population)	Rate in Rural Areas (Per 100,000 Population)
Primary care physicians	79	53
Nurse practitioners	81	65
Dentists	43	29
Source: [124; 141]		Table 2



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](https://apps.who.int/iris/bitstream/handle/10665/44589/9789241501514_eng.pdf)  
Last accessed July 21, 2022.)

**Level of Evidence:** Expert Opinion/Consensus Statement

## Nurse Workforce

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 (22.3%) is employed in education and health services, which includes physicians, nurses, social workers, home healthcare providers, and school teachers [2; 146]. Studies project by 2030, 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 excess of about 8% of the projected need and a national LPN deficit (shortage) of 13% of the projected need by 2030 [147].

However, these projections are national and do not necessarily reflect the projected supply or demand for rural areas. In predicting change between 2014 and 2030, California ranked high on an expected future shortage of full-time equivalent RNs. Alternatively, a high “excess” of RNs is expected in Florida, Ohio, Virginia, and New York. Historically, the U.S. supply and shortage for nurses has been cyclical, with periodic shortages of nurses followed by periods of overproduction leading to nursing surpluses [147]. For LPNs/LVNs, 17 states are projected to have an excess in 2030, led by Ohio and California [147]. In total, 33 states are projected to have a shortage of full-time equivalent LPNs/LVNs by 2030, with Texas expected to have the largest shortage followed by Pennsylvania [147]. Of these 33 states, 14 are Southern states, 7 are Midwestern states, 6 are Northeastern states, and 6 are Western states [147]. The growing demand for LPNs/LVNs by 2030 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 [147]. 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) [148]. Evaluation of these new delivery models and their impact on nurse supply will be needed in the future.

Frontier and rural communities have a greater likelihood of experiencing a nurse shortage than urban areas for multiple reasons. Most rural areas cannot compete economically with the urban areas for nurses, and urban nurses may not have the training preparation to cross over into rural health care [147; 148]. Policy solutions aimed at reducing nursing shortages in frontier and rural communities should consider that it is a different nursing context than an urban environment. Solutions that emphasize improving competitiveness may be short-lived and draw nurses away from and exacerbate the shortage elsewhere—possibly other rural and frontier areas [147; 148]. 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 nursing shortages over the long term. Building the capacity of the public health workforce is a priority policy solution [136]. An adequate rural workforce supply is expected to offset the shortage of preventive services and to prevent hospitalizations [145].

### 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 [150]. 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 [151]. 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 [152].

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 [32]. The death rates for rural unintentional injuries (e.g., motor vehicle crashes, drug overdose) are about double that of urban areas [151]. 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 [151].

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 [153]. 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 [136]. 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 [150].

### **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 [154]. As of 2022, an estimated 11,700 additional dentists are required nationally to meet care needs [145; 154].

### **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. The 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 [155].

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 Division of Scientific Education and Professional Development, to strengthen and develop the public health workforce through historical literature, reports, guidelines, global and local health data for research, legislation, and policy [156].

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 [157].

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 [155].

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 [6].

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 [6]. 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 [6; 159].

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 [159]. 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 [6; 159].

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 [6]. 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 [6]. 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 [161]. 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 [6].

### **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, 673 rural hospitals were vulnerable to closing as of 2016; of these hospitals, 355 were identified as being in markets with significant health disparities [141]. 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 [141]. 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 [136].

### Community Health Centers

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 [162]. 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 [163]. In 2020, more than 1,400 community health centers serviced nearly 29 million people across the United States and its territories [164]. 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 [165]. 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 [165]. 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 [140]. The center is an example of a well-coordinated, comprehensive care model that integrates services from various disci-

plines such as primary care providers, behavioral health practitioners, and dental professionals [166].

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 [162]. 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 [163]. 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 [163]. 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 [138].

The community health center can also be an important economic force in a community, offering employment and training opportunities and purchasing local services [165]. 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 [141]. In all, these centers advance a coordinated, comprehensive, patient-centered care model [166]. 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 [167].

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 [141; 165].

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 [168]. 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 [168]. 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 [169]. The compromised health of this population is believed to be rooted in historic economic adversity and poor social conditions [168].

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 2.6 million members of the 574 federally recognized tribes in 37 states [170]. 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 [170].

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 [6]. 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 [158]:

- 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 [158]. 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) [158].

### 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 [171]. 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 [171]. 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, 301 communities in 35 states, serving more than 780,000 people, have implemented evidence-based best practices diabetes treatment and prevention programs [171]. The IHS has reported a significant improvement for AI/AN program participants, perhaps most importantly a 10% reduction in the average blood glucose levels for those with diagnosed diabetes between 1996 and 2019 [171].

The IHS Early Childhood Caries Initiative provides AI/AN children with oral assessments and interventions to mitigate early childhood dental disease, giving public health nurses the opportunity to be part of a collaborative team effort improving oral health. Similar to the collaborative approach used by public health programs outside the IHS, the IHS

Early Childhood Caries initiative involves multiple stakeholders, including 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 [172]. In order to promote dental health, the 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 [172].

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 [173]. This program provides access to behavioral health professionals through telemedicine (telebehavioral health), which acts to expand the reach of preventive, educational, and treatment services [173].

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 [174]. 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 12 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 [175]. 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 [168]. Access to services only accounts for part of the overall determinants of population health [138]. 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 [138]. 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 [176]. 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 [6]. 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 [176]. Mutual partnerships may also include non-government stakeholders, such as the business community.

## Public Health Nursing and the Indian Health Service

Nurses working in or with the IHS play a vital role in improving the health and well-being of AI/AN populations. The IHS conceptualizes its public health nursing program as autonomous—flexible and individualized. For those in the IHS, the primary focuses of the public health nurse are on prevention of illness; promotion and maintenance of health through the provision of therapeutic services, counseling, and education; and advocacy [158]. This is accomplished through assessment and identification of individual, family, and community needs; consumer participation; and the planning and coordination of community health programs and services. In this environment, the public health nurse takes into account the prevailing economic, cultural, social, and geographic characteristics of his or her patients. Nursing actions are considered dependent, interdependent, and intradependent with other disciplines, and nurses are part of an interprofessional team of providers [158]. Many of the IHS sites throughout 35 states are in rural remote areas, and IHS nurses have connections with patients, the greater community, clinics, and hospitals.



In a consensus Canadian guideline, experts recommend that health professionals inquire about their native patients' use of traditional medicines and practices as part of routine health practices, including prenatal care.

([https://www.jogc.com/article/S1701-2163\(15\)30915-4/pdf](https://www.jogc.com/article/S1701-2163(15)30915-4/pdf). Last accessed July 21, 2022.)

**Strength of Recommendation/Level of Evidence:**

III-A (There is good evidence based on expert opinion to recommend the clinical preventive action.)



## 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 [177]. 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 38,000 AI/AN homes (or 9.5%). Of these homes, approximately 7,100 (or 1.8%) 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 [178]. 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 [179]. 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 Rural Development program enabled 65 communities through

a project spanning 75,000 square miles to receive connectivity, giving the communities access to services through advanced technology and resulting in better connectivity for native communities [177]. Today, more than 9,000 rural Alaskans and 750 businesses and organizations, such as regional health-care providers, school districts, and Alaska Native organizations, have broadband access, bringing new commerce, social, and educational opportunities to area residents [177]. Technology is also essential for public health personnel to link with each other into a network, working toward mutual goals. Because cultural issues are unique for each tribal nation, the assistance given by the USDA Rural Development program is diverse [177].

States are also involved in advocacy for tribal health. Nebraska, for example, has passed laws to improve the quality of life of native populations in their state. The state established a contractual relationship between the Nebraska Department of Health and Human Services and public health organizations and/or other health clinics having AI/AN clientele for the provision of education and public health services [179].

### 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 50% more likely to be obese [180]. Furthermore, AI/AN adults are nearly 30% more likely to be diagnosed with diabetes and 2.3 times more likely than non-Hispanic White Americans to die from diabetes [180]. 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) [181].

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 [182]. 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 has brought favorable results. As of 2015, more than 9,050 members of New Mexico's Navajo Nation have increased

access to healthy produce and are better educated on nutrition. Reports show, over a five-month period, 26 families in five Navajo communities participated in the project and increased their fruit and vegetable intake by 48%. Also, outcomes show an improvement in the BMI of adults and children participating in the initiative, with a decrease of 41% in BMI measured for participating youth. Due to the favorable outcomes and response from communities, the project continues to evolve. Local stores plan to host cooking demonstrations and support groups and expand the education part of the project to include healthy food preparation. 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 [183]. 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 [184].

### 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 million in 2050 [149; 185]. By 2050, it is estimated that older adults will account for greater than 20% of the U.S. population [149]. 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 [186]. 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 [187].

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 [188]. 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 [188]. 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 [189]. 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 [190].

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 [191]. 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 [191]. 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” [141]. 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 [192].

### **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 [193]. However, rural seniors are often disadvantaged in regard to social services and health care due to lack of financial resources in

rural areas [190]. 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 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 [194]. The USDA reports food insecurity rates for rural areas to be 11.6% in 2020 [194]. 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 [195]. 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 [195]. 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, skeletal-muscular 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 [196]. 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 U.S. adults. Projections show the number of people with Alzheimer disease and other dementias is growing. As of 2022, 6.5 million Americans were living with Alzheimer disease. 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. In 2018, there were 1,545 emergency department visits for every 1,000 Medicare beneficiaries with dementia [198; 200].

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 [200].

In an effort to measure the scope of the caregiver role in caring for those with dementia across the United States, data from the 2015–2016 Behavioral Risk Factor Surveillance System (BRFSS) was analyzed [200; 201]. Based on this data, one in five adults are caregivers, providing regular care or assistance to a friend or family member with a health problem or disability, typically a parent or parent-in-law. About 10% of caregivers are caring for someone with dementia. Based on the BRFSS, nearly one in three home caregivers with duties related to Alzheimer disease report a decline in self-health [200; 201].

### **The Role of Nurses**

Nurses comprise the largest proportion of the rural healthcare workforce and are most likely to participate in senior programs and groups. Because public health nurses in rural areas often have a broad scope of practice and a high level of autonomy, it is essential that they are fully prepared to provide care to elderly patients and are familiar with the aging population [1]. In order to improve health and quality of life for persons and communities at every stage of life, nurses should engage in activities to promote health, prevent injury, manage chronic conditions, facilitate social engagement, and optimize physical, cognitive, and mental health [189]. The National Prevention Strategy recommends educating professionals to assess, identify, and address disparities that could be exacerbated with age [189]. 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 National Prevention Council suggests shifting from the traditional, reactive personal health and wellness approach to a more modern, proactive approach that emphasizes prevention [189]. To support healthy aging, the Council encourages a collaborative effort across the disciplines and professions to work together on this approach [189].

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## **IMPROVING THE RURAL PUBLIC HEALTHCARE SYSTEM**

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### **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 [202]. 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 [203]:

- 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 [203]. 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 [203]. 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 [204].

The CDC defines surveillance as the process of continuously monitoring attitudes, behaviors, and health outcomes over time [205]. 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 [206].

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 [207].

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 [74]. 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 [208]. 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 [208]. 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 [201]. 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 [201]. 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](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 [203]. 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 [209]. 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 [209]. 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 [209].

In Wisconsin, the state has authorized grants to businesses for the development of worksite wellness programs to include health risk assessments [210]. 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 [211]. 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 [212]. 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 [212].

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 [213]. 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 [213]. 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 [213]. 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 [213]. 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 [203]. 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 [214]. 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 [202]. 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 [215]. 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 [179].

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 [206]. 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 [203].

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 [203].

Citizen engagement can also be used to bring together community programs and clinical services. In Oregon, community residents who have experienced colon cancer screening engage in outreach to other residents to encourage participation in similar screening services using multiple communication channels, including radio advertising, social media, websites, billboards, health plans, and local news outlets. The overall campaign resulted in an increase in the rate of screenings among residents across the communities—from 59% in 2010 to 69% in 2015 for those 50 to 75 years of age. Also, late-stage colorectal cancer diagnoses were reported to have decreased by 12% for the years 2009 to 2013 for those who did participate in the screening [218].

## 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 6.5 million Americans and resulting in \$321 billion in annual costs [200]. By 2050, 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 [198].

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 [198]:

- 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 [198].

The Healthy Brain Initiative encourages training the healthcare workforce so it is intellectually prepared to provide cognitive impairment and dementia care [198]. 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 [198].

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) [198].

Monitoring and evaluating the growing dementia care issue is aligned with the chronic disease epidemiology and surveillance intervention [203]. 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 [198]. More information on the conceptual framework for the Healthy Brain Initiative and its 25 action items for public health professionals can be found online at <https://www.cdc.gov/aging/pdf/2018-2023-Road-Map-508.pdf>.

### 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 [219]. 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 [220].

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 [134; 179]. As nurses are a backbone to rural health care, some states have passed laws or enacted campaigns to increase the density of nurses practicing in underserved areas. For example, Arkansas law permits public higher education institutions to give special

consideration to recruit students from medically underserved areas interested in nursing or another health-related career [179]. 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 [179].



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](https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf). Last accessed July 21, 2022.)

**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 nurses in rural 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 [221]. The West Virginia State Loan Repayment 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 [222]. 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 [223]. Other evaluative studies, including one conducted by the VA on their rural telehealth initiatives, report numerous favorable outcomes associated with telehealth actions [135]. However, some still express doubt as to the real value of telehealth's ability to replace traditional care services [135].

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 [135]. 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 [224]. 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 [136]. 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 [136].

Collaborative telehealth programs involving public agencies, medical centers, rural and/or urban clinics, universities, and professionals were developed in response to early telehealth projects that required additional funding and stakeholder buy-in in order to continue after federal funding ended. One example of this approach is the South Carolina Department of Mental Health, which partnered with the University of South Carolina School of Medicine and about 18 predominantly rural hospitals to develop a statewide telepsychiatry initiative [225].


### Telehealth

There have been a number of definitions for telehealth, varying across organizations and healthcare work cultures. The American Telemedicine Association defines telehealth as [226]:

...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 [227]. 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 [136]. Most rural states have historically used telehealth for this purpose.



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](https://apps.who.int/iris/bitstream/handle/10665/44369/9789241564014_eng.pdf). Last accessed July 21, 2022.)

**Strength of Recommendation/Level of Evidence:**  
Strong/Low

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 [228]. 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 [229].

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 [231]. The Southern Nevada Health District created an Internet and social media educational campaign regarding the health risks of cigarette smoking and e-cigarette use in teens. This online nicotine prevention campaign is reported to have reached at least 2,400 people on social media, 27,130 people via online campaign videos, and 287,000 via online messaging; a reported 1,113 teens took the educational campaign’s online training to learn how they can help promote nicotine-free living among their peers using social media [231].

Rural school nurses are in a pivotal position to link health care and education, and Internet technologies can help link nurses with nonrural resources, network with other agencies, make point-of-care decisions, attend distant meetings, enter surveillance data, and access public reports [232]. Technology can also aid in student health and wellness screenings, providing behavioral health services, assessing injuries and illnesses, and communicating with parents/guardian. The role of school nurses in providing rural health care will be discussed in detail later in this course.

### **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 health-care 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 [24]. Broadband connectivity has made great strides in recent years, and county-level data indicate that rural household connectivity continues to improve and expand geographically [135]. In 2019, 72% of rural residents and 63% of rural residents in persistent poverty counties had moderate- or high-speed broadband available [24]. 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 [24]. 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 [136]. The Health Resources and Services Administration has predicted a nurse shortage by 2030, with the largest shortages noted in states with significant rural populations (e.g., Alaska, South Carolina, South Dakota) [147]. Shortages are not new, and building the capacity of the

health workforce is part of the national movement to strengthen and transform the healthcare system.

### **The Role of the Government**

In response to need, U.S. Congress has historically passed laws to build the capacity of the nursing 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 expanded nursing training actions and funding.

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 [234]. 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 [235; 236]. 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 [237].

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].

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) [134; 179]. 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 [134; 145].

### **Workforce Cultural Competency**

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 [238].

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 [134]. As of 2016, more than 30 states had enacted legislation to improve cultural competency in their healthcare workforces [134]. 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 [134].

### **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 [239]. 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 [240]. 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 [240]. As of 2018, 36 states and the District of Columbia have implemented state loan repayment programs and receive grants from the National Health Service Corps to help fund these programs. Some states have expanded the program to other regions. Nevada and New Hampshire, for instance, expanded the criteria for health workers receiving financial support or loan forgiveness to include those who provide services to medically underserved populations and in other needy locations [134]. In all, the majority of states have passed laws providing an incentive for practitioners to seek work in professional shortage areas and other underserved needy areas.

### **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 [141]. 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 [140]. 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 [241].

### 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 [15]. 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 [145; 241]. 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 [242]. 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 non-traditional, tribal, school-based, and community settings [145]. 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 [242].

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 com-

munity 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 [242]. These solutions have potential to mitigate dental disease in rural underserved communities.

### 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 [243]. 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 [244]. 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 [245]. 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 [244]. 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 [141].

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 [246]. 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 [247]. 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 health-care 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 [248]. Each day, public schools provide a setting for 49.4 million students to learn about health and healthy behaviors [249]. 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 [249]. Physical activity may be integrated into classroom lessons, through intramural or sports programs, at lunchtime, or during recess [250].

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 [251]. 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 [251]. 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 [252]. 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 [253]. 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 [232]. 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 [232].

### 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 [254]. 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 [255].

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 [256]. 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 [257]. 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 [258].

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 [141]. 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 [248]. 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 [259]. 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 [260]. 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 [260]:

- 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 2020, 21.5% of households speak a language other than English at home [262]. 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 [263]. 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 [264]. 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 [264]. 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 [264]. Individuals with limited English language skills have actually indicated a preference for professional interpreters rather than family members [217].

Most important, perhaps, is the fact that clinical consequences are more likely with ad hoc interpreters than with professional interpreters [216]. 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 [197; 199].

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.

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## CONCLUSION

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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.

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## RESOURCES

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**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.

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