The Relationship Between Rural Setting and Health
Factors that Influence Individuals With or at Risk of CVD

A Summary of the Literature

Introduction

The sixty million Americans living in rural areas face significant health disparities due to a number of unique challenges associated with where they live.[1] Risk factors including poor diet and comparatively low rates of physical activity among individuals in rural communities are associated with a number of negative health effects, including cardiovascular outcomes.[2,3]

Unfortunately, rural residents often have limited access to healthcare services to address cardiovascular and other health concerns.[4] A scarcity of primary and specialty care providers, long travel distances to services, and unreliable transportation together create an environment in which individuals do n ( )0.n TJ 0.001 Tc -0.001 Tw 0 -1.261 Td [(c)

geographically diffuse populations. Different definitions have been used for eligibility for programs; implementation of laws; and research and data collection at the state and federal levels.[22]

Cardiovascular Risk in Rural Areas: Obesity and Other Factors

Poor diet, lack of physical activity, obesity, and smoking are all risk factors associated with cardiovascular disease.[24] In general, rural areas of the United States have higher obesity rates,[25,26] higher rates of smoking,[27] and lower rates of physical activity[28] than urban areas. For example, one study found that adolescents in Appalachia had obesity rates more than twice the national rate, putting them at high risk of cardiovascular disease.[29]

As a result, rural populations face amplified health risks, including cardiovascular disease risk, compared to other communities. Examining social and physical infrastructure in rural communities can help determine the most effective ways to increase rural residents' access to healthy food and decrease sedentary and smoking behaviors.[30,31]

Nutrition and Physical Activity in Rural Settings

Disparities in rural obesity rates are not individual failings but rather systemic issues. For example, research suggests individuals in low income rural communities have less access to healthy and fresh foods when compared to their urban counterparts.[32,33,34] Access is hindered by higher costs, particularly for healthy food,[35] as well as fewer places to buy food (i.e.,

Access to Care in Rural Areas

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Evidence on Rural Access to Cardiovascular Care / Stroke Services

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Emergency Service Providers

There is some evidence to suggest that emergency service providers may help fill gaps within the rural healthcare system. Currently, it is estimated that at least a third of community paramedicine programs operate in rural areas.[119] Paramedicine is an expanded model in which emergency medical service (EMS) providers fill gaps in care by providing immunizations, care coordination, and post-hospital discharge care, such as monitoring medication adherence.[120] A 2016 study identified 31 rural community paramedicine programs, in which specially trained providers helped increase access to medical care by targeting populations such as high emergency care users and providing care beyond emergency services.[121]

Meanwhile, EMS-based care coordination, in which paramedics screen and refer patients for services and items such as transportation, food, and insurance, appears to be a rising model for helping residents who may depend on EMS as their only source of clinical and social support.[122] New technologies may also assist EMS providers in extending their reach. One study used mathematical models to estimate that emergency responders could use automated external defibrillators (AEDs) via drones to treat cardiac events faster than current in-person responders.[123]

While some paramedicine programs in rural communities are funded by various levels of government, most are self-funded or receive grants, with only some reimbursement by insurance plans.[124] Unstable funding poses a challenge; for example, programs in Vail, Colorado and Scott County, Minnesota, ceased operations temporarily while state legislators debated funding, highlighting the dependence on state resources for operation.[125]

Community Health Workers

Community health workers (CHWs) can also increase access to care in rural areas. CHWs provide direct, culturally tailored care to targeted populations.[126,127,128,129] CHWs have been shown to help increase cancer screening rates; improve community knowledge about risk factors; integrate care coordination; expand access to basic primary care in underserved areas, including prenatal care; and provide effective chronic disease care—often at cost-savings.[130,131,132,133,134,135,136]

As evidence grows to support increased CHW utilization, health departments have begun to build inter-sectoral coalitions to target care in both high- and low-risk rural populations, with promising results.[137,138] For example, a CHW-led prenatal mobile health campaign in rural Nebraska was well-received by the participants, cost-effective, and showed promising results in improving patient communication and self-care during pregnancy.[139]

CHWs may also be critical in

Targeted Gap-Filling Approaches

Targeted strategies to specifically address shortages of cardiologists and other providers in rural areas have also shown promise. For example, cardiologists in Iowa have expanded access to office-based cardiology care through visiting consultant clinics in which cardiologists, usually from urban areas, make regular visits to rural healthcare settings.[150] Better screening tools for primary care providers can also alleviate the demand for specialists; for example, initial testing using precision medicine blood tests can preliminarily rule out obstructive coronary artery disease (CAD) in patients exhibiting symptoms and can help avoid unnecessary visits to specialists for advanced cardiac testing.[151]

For stroke care, implementation of best practices in treatment allows patients to be evaluated and receive treatment faster and more efficiently.[152] For example, many states have implemented routing policies which ensure that stroke patients are transferred to primary stroke centers.[153] Alternatively, Critical Access Hospitals (CAHs), special rural hospitals that receive enhanced payment, and other rural facilities can take steps to become certified

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telehealth services at the same rates as in-person care have seen faster telehealth growth rates than those without.[171,172,173,174]

Changes in policy have been accompanied by increases in federal funding to support telehealth services and the infrastructure necessary to support them. The Health Resources and Services Administration (HRSA) grants have funded efforts to increase telehealth services in Federally Qualified Health Centers (FQHCs), which serve approximately 1 in 5 rural residents.[175] As a result of these policy changes and investments, the telehealth industry is growing at an annual rate of 70 percent and is expected to be worth $36.3 billion by 2020.[176,177]

However, more than 34 million Americans, most of whom live in rural areas, lack adequate broadband internet access to support telehealth as well as electronic health records and imaging tools.[178] Efforts at the federal government to provide internet and by extension telehealth services exist. The ConnectAmerican Broadband Initiative, an interagency effort, seeks to expand broadband infrastructure across the country, and has dedicated $600 million for a new broadband pilot program in rural areas.[179]

While most research on telehealth focuses on service provision, technology could also be used to address the rural workforce shortage gap by improving access to medical education in rural areas. One study found that administration of a tele-based objective structured clinical exam (OSCE) was economically feasible .2 (as)15 (t)-4.1 ci Td

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