

**KEY DETERMINANTS OF RURAL HEALTH
IN RHODE ISLAND
2016**

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Executive Summary

The purpose of this report is to systematically assess and review the health needs, behaviors, and statuses of the individuals living in rural Rhode Island. Using health-related data, statistics, and the newly designated definition of rural Rhode Island, this report can be used as a guide to identify places of need and recognize challenges in rural parts of the state. Furthermore, this report can be used as a tool for developing subsequent strategies that effectively allocate resources to the most underserved rural areas in the state. This report can also function as a starting point for identifying the strengths of rural areas in terms of health behaviors and health outcomes, thus enabling the development of future projects designed to support the continued success of rural towns and communities.

The Office of Primary Care and Rural Health (OPCRH) supports the Rhode Island Department of Health (RIDOH) strategic priorities and overall mission, and specifically seeks to address healthcare disparities created by lack of access to high-quality healthcare due to several potential barriers, including those that are geographical in nature.¹

OPCRH will utilize this report to prioritize initiatives that address RIDOH’s strategic plan, namely, minimizing health disparities among Rhode Island residents by targeting the larger social frameworks of health. This

report specifically addresses place of residence as it relates to health access, utilization, and outcomes, thus recognizing the importance that geography and social isolation play in the general health of a particular community. By dedicating resources to the rural areas in Rhode Island, geographical barriers to health may be effectively diminished, and access to quality healthcare for rural community members will be enhanced. In creating this comprehensive report, key determinants of health, including the social determinants of health, in rural areas can be catalogued and further assessed.

The Office of Primary Care & Rural Health’s Mission:
“To address health disparities created by lack of access to high quality health care due to financial, cultural, and geographic barriers.”

The data and the statistics contained in this report were collected from several databases, governmental agencies, and non-profit organizations. It is important to note that the data used in this report are subject to limitations common to rural data usage, namely small sample sizes, which affect the validity and generalizability of the measures and findings. The OPCRH has made every effort to identify and address these challenges throughout the report. The data have been analyzed and appropriately categorized to follow the Rhode Island definition of rural towns. The definition used to categorize towns and cities into the rural and urban categories is explored in depth in the following section. The definition was developed by the OPCRH in 2015, updating the definition that had been used since 2011. When data for individual towns and cities were not available, county data and cluster data (multiple cities) are provided.

In some aspects, it is clear that rural Rhode Island is flourishing. In general, the rural populations of Rhode Island are healthier and engage in less risky health behaviors than their

¹Primary Care and Rural Health, Office of: Department of Health [Internet]. Health.ri.gov. 2016 [cited 2016 Mar 24]; Available from: http://health.ri.gov/programs/detail.php?pgm_id=27/

urban counterparts; this is a unique trend that is not reflected in national patterns. However, there are also several areas of concern that warrant further consideration, particularly in regards to healthcare access, service utilization, patient integration, and transportation. This report can and should be used as a tool to better target these health-related areas that are in need of improvement.

Introduction

The RIDOH is guided by three main strategic priorities: 1) Address the social and environmental determinants of health in Rhode Island, 2) Eliminate the disparities of health in Rhode Island and promote health equity, and 3) Ensure access to quality health services for all of Rhode Island, including for our vulnerable populations². These priorities, and related initiatives, help to support positive population health outcomes, including those that are specifically related to rural communities throughout the state. Unquestionably, when considering the health and well-being of the state-wide Rhode Island population, it is important to consider the individuals that are living outside of the core cities in the more rural areas of the state. Too often, efforts to increase the health of urban populations take precedence over rural health initiatives. In order to effectively meet RIDOH's strategic priorities, there must be a shift to encompass all communities, engaging both urban and rural stakeholders in plans for change. However, while it is important to include rural towns in statewide plans for improvement, it is inappropriate to simply consider these rural areas as "smaller urban communities." This idea operates under the assumption that effective programs designed for and implemented in urban areas will be effective in rural ones as well, and simply operated on a smaller scale. In reality, these rural communities have different needs, face unique challenges, and possess different strengths than their urban counterparts, and there is a serious unmet need in the implementation of targeted statewide and local programs in these rural areas. This report is one of many necessary steps in ensuring equitable access to quality care in rural towns across the state.

Rhode Island

Rhode Island, the nation's smallest state, measures 1,214 square miles, including the 35 islands off of the Eastern and Southern coasts.² Within the five counties, there are eight cities and 31 towns, including the town of New Shoreham, which is located on Block Island and lies 14 miles south of Point Judith. The 2010 US Census estimation of Rhode Island's population is 1,056,298.³

In an overview of Rhode Island, it is easy to assume that because of its limited square mileage, the populated urban areas, likely constitute much of the state's land mass. This assumption, however, would be incorrect. The larger, most densely populated cities of Rhode Island, such as Central Falls, Providence, Pawtucket, and Woonsocket, are clustered in the Northern-Central part of the state,⁴ and while Rhode Island only has a maximum East-West distance of 37 miles and a maximum North-South distance of 48 miles, the relative closeness of the major cities to the rest of the state certainly does not make Rhode Island exclusively urban.²

While many of the core-surrounding communities are more urban in nature, several of the towns are rural, in both appearance and constitution. These rural areas have smaller populations,

²Home: Department of Health [Internet]. Health.ri.gov. 2016 [cited 2016 Feb 10]; Available from: <http://www.health.ri.gov/>

³ Secretary of State, State Facts and Figures [Internet]. 2010. [cited 2016 Feb 10]; Available from: <http://sos.ri.gov/library/history/facts/>

⁴ Core Cities Data [Internet]. www.health.ri.gov 2011 [cited 2016 Feb 17]; Available from: <http://www.health.ri.gov/publications/databooks/2011CoreCitiesDataChildhoodLeadPoisoning.pdf>

are less densely populated areas than other communities in the state, and are also characterized by some degree of social or geographical isolation. General and social isolation, a constant barrier in most rural communities, has profound implications for the health of populations.

Defining Rural

One challenge in making a distinction between the urban and rural parts of the state is the lack of criteria for classifying each town and city as such. Certainly, the government has developed several federal definitions of rural, but none adequately characterize the unique towns and cities of Rhode Island.

Nationally, the most commonly used federal definitions are from the U.S. Census Bureau, the Office of Management and Budget, and the Federal Office of Rural Health Policy. Each agency uses different criteria to classify towns, cities, or counties as urban or rural (or, more simply, as “non-urban”).⁵ The federal definitions consider commuting patterns, proximity to urban centers, or population size to determine the rural areas of a state. Under the Federal Office of Rural Health Policy definition, the only Rhode Island town that is considered rural is New Shoreham, on Block Island.⁶ While the federal definitions are ideal for a variety of policy and administrative purposes, they are not truly designed to capture the variations between states, especially in terms of healthcare equity and access. Therefore, an important preliminary step to the development of this report was the creation of a unique, suitable definition to determine what constituted “rural” in Rhode Island.

The OPCRH, building on work done in 2011, developed a rural definition unique to the needs of the state. The new rural definition classifies any town with a population size of less than 25,000 AND a population density of less than 1,000 individuals per square mile as a rural community. Under this definition, the followings towns (no cities) have been designated as rural: in Providence County, Burrillville, North Smithfield, Foster, Glocester, Scituate, and Smithfield; in Kent County, East Greenwich, and West Greenwich; in Washington County, Charlestown, Exeter, Hopkinton, New Shoreham, Richmond, and Westerly; and in Newport County, Jamestown, Little Compton, Portsmouth, and Tiverton.

⁵ HHS.gov [Internet]. HHS.gov. 2016 [cited 2016 Feb 7]; Available from: <http://www.hhs.gov/>

⁶ Federal Office of Rural Health Policy [Internet]. Hrsa.gov. 2016 [cited 2016 Feb 6]; Available from: <http://www.hrsa.gov/ruralhealth/>

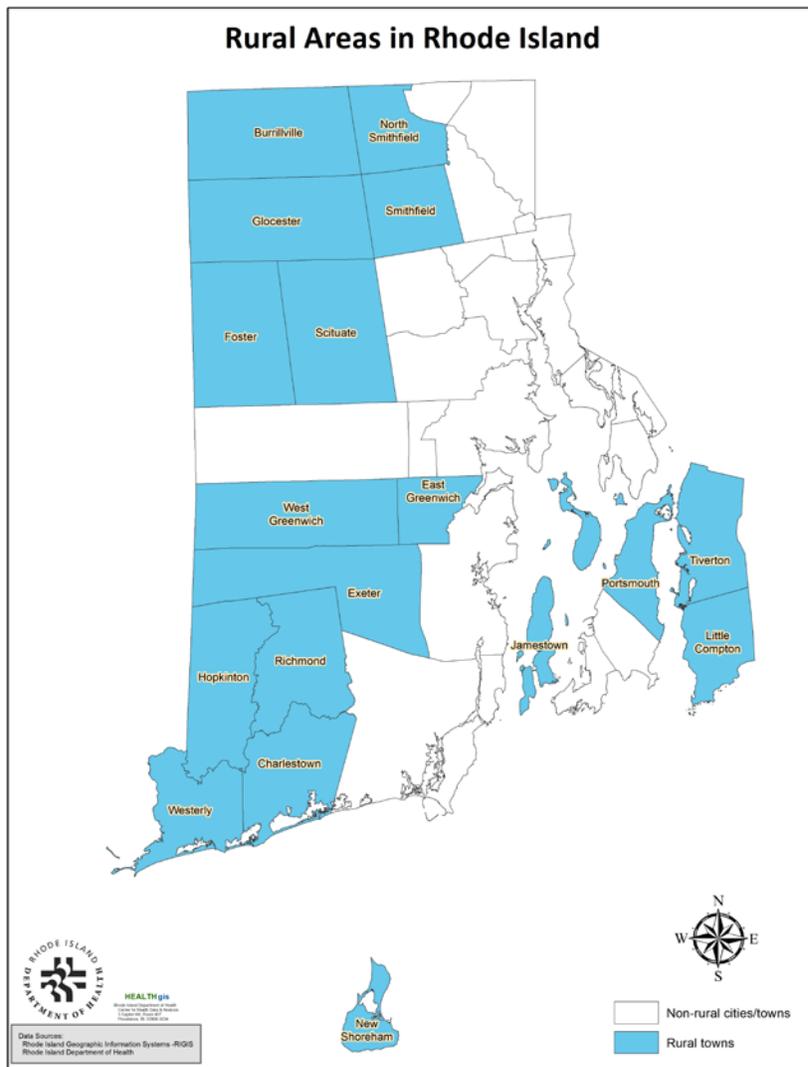


Figure 1. Rural Areas in Rhode Island.

OPCRH includes the two-tiered criteria –population size and population density – in the definition because each contributes to the general constitution of the community. Especially in the western part of the state, there are many larger towns (e.g., Burrillville, Gloucester, Scituate, and Exeter) that have large populations and significant geographical area, but are not especially dense. By including population density as a criterion, areas like these that have large populations but that are sparsely populated (indicating a degree of social and geographical isolation) are considered rural. The OPCRH definition combats the prevailing notion that all rural areas are “small,” and supports the fact that some communities that are expansive may be lacking in resources that are often

present in the equally as large, but more densely populated communities. The OPCRH definition intentionally does not exclude towns that are small, like Jamestown and Little Compton. Like their larger counterparts, these smaller rural areas frequently face challenges related to lack of resources and capital.

The OPCRH definition does not include factors related to proximity to urban centers, or to commuting patterns. The small size of Rhode Island makes these criteria irrelevant; a purely objective analysis of distance to major cities or to commuting patterns into the major cities would result in very few rural areas in the state, because the East-West mileage and the North-South mileage is so limited. Regardless of Rhode Island’s small size, it is inappropriate to conclude that a proximity to one of the core cities is enough to guarantee adequate access to quality, reliable resources, including healthcare.

For the purposes of this report, “rural” will refer to the 18 towns that meet the OPCRH definition of rural. The other 21 towns and cities will be referred to as “urban.”

Rural Rhode Island

The populations of the 18 rural towns compose 17.9% of the overall state population, which means that over 189,000 Rhode Island residents are living in a rural town. These individuals, as evidenced by the information discussed in this report, are facing significant healthcare barriers related to access and quality.⁷

Overall, 75.1% of Rhode Island’s population identifies as non-Hispanic white, but rural

Race	Rural Communities	Urban Communities
Non-Hispanic White	96.0%	85.5%
Non-Hispanic Black	0.7%	4.2%
Hispanic	1.8%	9.8%
Other	1.5%	0.5%

towns are less diverse, with 94.0% of the rural population identifying as non-Hispanic white. Age structure of the population differs between rural and urban towns and cities, with rural towns having a greater proportion (17.2%) of older

Table 1. Race distribution in urban and rural communities (2014 BRFSS).

adults (those age 65 and older) than urban areas (15.8%). The average poverty rate, defined as those number of individuals below the Federal Poverty Level, across rural towns (7.0%) is lower than the state average (13.2%), but it should be noted that significant variability in this measure exists between the rural towns, with poverty rates ranging from 3.8% - 11.0%. In urban areas, 28.7% of the population had at least one year of college compared to 32.4% in rural towns. Similar to poverty rates, however, there is a large amount of variation in education levels, with some rural towns having a percentage of individuals who attended college as low as 14.0%.⁸ The urban-rural distribution of education level in Rhode Island is unusual. Typically, rural areas have lower rates of higher education levels when compared to urban areas.⁹

In terms of employment, rural residents are less likely to be out of work (6.6% compared to 8.4% in urban areas). Again, this trend is the reverse of what is expected. National data suggest that following the Great Recession of 2007-2009, urban areas have returned to their pre-recession unemployment rates, with an average employment growth of 10% over a four-year period.¹⁰ In comparison, rural areas have experienced a 1.1% growth over the same period, and most areas have not returned to their pre-recession employment rate.¹¹

There are more individuals that are retired (19.9%) living in a rural area (compared to 17.2% in urban areas), which supports the distribution of age in rural-urban locations (rural areas tend to have an older population when compared to urban areas).

⁷ American FactFinder - Community Facts [Internet]. Factfinder.census.gov. 2010 - 2014 [cited 2016 Feb 3]; Available from: http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

⁸ Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014.

⁹ Provasnik S. Status of Education in Rural America [Internet]. National Center for Education Statistics; 2007 [cited 2016 Feb 11]. Available from: <http://nces.ed.gov/pubs2007/2007040.pdf>

¹⁰ Rural America at a Glance [Internet]. United States Department of Agriculture: 2015 [cited 2016 Feb 12]. Available from: <http://www.ers.usda.gov/media/1952235/eib145.pdf>

¹¹ Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014

Demographics can be used as key indicators to describe the overall health status of a population. While the following sections explore rural Rhode Island in greater detail, it is crucial to remember the demographic makeup of rural communities in order to complete thoughtful and robust analyses.

Healthcare Delivery and Provider Workforce

In rural communities, both in Rhode Island and throughout the United States, low numbers of local healthcare providers and limited public transportation create barriers to accessing healthcare.¹² Effective healthcare delivery is influenced through the availability of outpatient primary care providers, behavioral health specialists, dentists, and other oral healthcare practitioners, and the distribution of inpatient and urgent care facilities. In evaluating the overall health and well-being of rural Rhode Islanders, it is important to consider the number of providers, the ease of access to those providers, and the general healthcare delivery system found in or in close proximity to the rural towns.

In 2015, the Rhode Island Department of Health completed a comprehensive healthcare capacity and utilization survey, the *Rhode Island Health Planning Inventory Report*, of providers and consumers across the state to be used as a cornerstone for developing an effective healthcare plan in Rhode Island.¹³ The *Rhode Island Health Planning Inventory Report* collected data on several aspects of health, including primary care and outpatient services, hospitals, behavioral health, and assisted living facilities. The following section explores the survey findings in the rural towns of RI.

Primary Care

The table on the following page depicts the number of Full-Time Equivalent (FTE) physicians in the rural towns of Rhode Island. FTEs provide an accurate representation of not only the number of primary care physicians practicing in a certain geographical location, but also of their general availability and overall accessibility. The ratio of the population to the FTE physician is also provided.

To ensure appropriate access to care for a population of patients, The Henry J. Kaiser Family Foundation has published “access to care indicators” through its *Medicaid Managed Care Organization Access Standards Report*, and has made recommendations for the appropriate full-time physician to patient ratio.¹⁴ In Rhode Island, the maximum number of enrollees per full-time equivalent primary care provider to facilitate quality care provision has been designated as 1,500:1.

Data from the *Rhode Island Health Planning Inventory Report* on primary care physician workforce indicated that approximately 94% of rural towns in RI have a patient to primary care

¹² Finding Healthcare in Rural Rhode Island [Internet]. Rhode Island Department of Health [cited 2016 15 March]; Available from: <http://www.health.ri.gov/publications/resourcedirectories/FindingHealthcareInRuralRI.pdf>

¹³ Long, et al. Rhode Island Health Planning Inventory Report: Utilization and Capacity Study [Internet]. Rhode Island Department of Health 2015 [cited 2016 17 March]; Available from: <http://www.health.ri.gov/publications/reports/2015HealthInventory.pdf>

¹⁴ Medicaid MCO Access Standards: Primary Care. Henry J. Kaiser Family Foundation 2015 [cited 8 February 2016]; Available from: <http://kff.org/other/state-indicator/medicaid-mco-access-standards-primary-care/> (Accessed: 8 February 2016).

physician (PCP) ratio greater than the recommended 1500:1 ratio. Furthermore, 65% of these rural towns have a ratio over 3000:1.

Across rural towns there were an estimated 98.5 FTEs, for an overall ratio of FTEs to population of 1725:1. This ratio is close to the state-wide ratio of 1718:1; however, the ratio varies widely by town ranging from 13,544:1 in Scituate to 290:1 in East Greenwich. Seven rural cities have less than one full-time primary care physician, with four of these cities having no PCPs at all.¹⁵ As with most rural areas where transportation is a major barrier to accessing systems of care, this is true of Rhode Island where the public transportation is very urban-oriented.

Town/City	Total Hours/Week	Total FTEs/Week (1 FTE = 40 hrs.)	Civilian Population	Population to 1 FTE Primary Care Provider
Burrillville	72.0	1.8	15,605	8,669.4
Charlestown	32.0	0.8	7,821	9,776.3
East Greenwich	1,801.0	45.0	13,061	290.1
Exeter	0	0	6,572	0
Foster	43.0	1.1	4,609	4,287.4
Glocester	0	0	9,777	0
Hopkinton	112.0	2.8	8,134	2,905.0
Jamestown	59.0	1.5	5,423	3,676.6
Little Compton	12.0	0.3	3,490	11,633.3
New Shoreham	40.0	1.0	836	836.0
North Smithfield	294.5	7.4	11,696	1,588.6
Portsmouth	311	7.8	17,067	2,196.9
Richmond	0	0	7,574	0
Scituate	31.0	0.8	10,345	13,348.4
Smithfield	490.0	12.3	20,924	1,708.1
Tiverton	200.0	5.0	15,739	3,147.8
West Greenwich	0	0	6,076	0
Westerly	435.3	10.9	22,327	2,051.9

Figure 2. Full-Time Equivalentents and ratios in rural towns (*Rhode Island Health Planning Inventory Report*).

Furthermore, a detailed analysis of primary care practice characteristics across the state found that electronic health record adoption was lower in rural practices (77.6%) than in urban practices (86.3%). Patient-centered medical homes were also less common in rural areas (38.8%, compared to 46.3% in urban areas).¹⁵ These two measures indicate a possible inequitable division of resources between urban and rural areas, and a decreased ability of rural areas to provide efficient, effective, and comprehensive primary care services to the individuals living in those communities.

¹⁵ Long, et al. Rhode Island Health Planning Inventory Report: Utilization and Capacity Study [Internet]. Rhode Island Department of Health 2015 [cited 2016 17 March]; Available from: <http://www.health.ri.gov/publications/reports/2015HealthInventory.pdf>

Behavioral Health

Behavioral and mental health practices provide important services to many individuals. The Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals defines treatment services included in behavioral health to mean “long-term hospital care; mental health and psychiatric services; substance abuse prevention and education, a wide range of drug and alcohol treatment service, and residential, day programs and support services for people with developmental disabilities.”¹⁶ Clearly, behavioral health services play a crucial role in meeting the healthcare needs of a diverse group of individuals. For rural residents, who are often socially and geographically isolated and may lack the familial, financial, and community support needed to effectively manage their behavioral health concerns, access to behavioral care specialists is critical. In *Rural Healthy People 2020*, increased access to mental illness and substance services were cited as top priorities for rural residents across the country.¹⁷

Many of the behavioral health sites are located in the urban-core part of the state (e.g. Providence and Pawtucket). The only rural areas with behavioral health sites are Burrillville, Smithfield, Westerly, Charlestown, and Exeter. Options for adult day care, home care and long-term care in rural towns are extremely limited. Telehealth is not reimbursable and consequently its use is limited to a few services and the utility of telehealth for providing services in rural areas is not recognized. The limited distribution of behavioral health sites has the potential to severely limit the effectiveness of behavioral healthcare delivery, especially in rural towns.¹⁸

Hospitals

Rhode Island has 13 acute care hospitals, as well as a state psychiatric hospital and a VA Medical Center.¹⁹ The following is a list of these facilities, including the town or city of its location.

¹⁶ Department of Behavioral Health, Developmental Disabilities, and Hospitals: Rhode Island Department of Health [Internet]. Health.ri.gov. 2016 [cited 2016 Mar 24]; Available from: <http://www.bhddh.ri.gov/>

¹⁷ Bolin, Jane et al. Rural Health People 2020 [Internet]. School of Rural Public Health, Texas A&M Health Science Center 2015 [cited 2016 9 Feb]. Available from: <https://sph.tamhsc.edu/srhrc/docs/rhp2020.pdf>

¹⁸ Wilson, Will et al. the Future of Rural Behavioral Health [Internet]. National Rural Health Association Policy Brief 2015 [cited 2016 18 Aug]. Available from file:///Users/Katelyn/Downloads/TheFutureofRuralBehavioralHealthFeb.2015.pdf

¹⁹ Long, et al. Rhode Island Health Planning Inventory Report: Utilization and Capacity Study [Internet]. Rhode Island Department of Health 2015 [cited 2016 17 Mar]; Available from: <http://www.health.ri.gov/publications/reports/2015HealthInventory.pdf>

Bradley Hospital	East Providence
Butler Hospital	Providence
Kent Hospital	Warwick
Landmark Medical Center	Woonsocket
Memorial Hospital	Pawtucket
Miriam Hospital	Providence
Newport Hospital	Newport
Our Lady of Fatima Hospital	Providence
Rhode Island Hospital	Providence
Roger Williams Medical Center	Providence
South County Hospital	South Kingstown
Westerly Hospital	Westerly
Women & Infants Hospital	Providence
Eleanor Slater Hospital	Cranston/Burrillville (two units)
Providence VA Medical Center	Providence

Figure 3. Hospitals in Rhode Island.

Of the 15 hospital facilities, only two are located in a rural area (Westerly Hospital and the Burrillville unit of the Eleanor Slater Hospital.) Therefore, for the majority of rural residents, receiving care from an acute care hospital is extremely difficult. The distribution of hospital facilities is an important component of an effective healthcare delivery system. A lack of facilities and other similar resources in rural areas contribute to the health disparities that exist between urban and rural residents.

Federally Qualified Health Centers, or FQHCs, receive grant money under Section 330 of the Public Health Service Act.²⁰ The FQHCs qualify for enhanced reimbursement from Medicare and Medicaid, and must fulfill several criteria to maintain their status, including providing care for an underserved area or population and offering a sliding fee scale for their comprehensive services. In Rhode Island, there are eight FQHCs with 31 service sites across the state.¹⁷ Of those 31 sites, only three are located in rural towns.

Health Professional Shortage Areas

Through the U.S. Department of Health and Human Services, the Health Resources and Services Administration designates urban and rural areas, population groups, medical or other public facilities as Health Professional Shortage Areas (HPSAs). A HPSA designation guarantees eligibility for a variety of federal programs, in an effort to maximize the healthcare delivery and workforce in those areas. An area may be designated as having a shortage of primary medical care, dental, or mental health providers.²¹

As of June 2014, there were 6,100 primary medical care HPSAs across the country. An area or population group is determined to be a primary care HPSA if there is a physician to population ratio that is greater than 1:3,500. Also in 2014, there were 4,900 dental HPSAs; an area is considered to have a dental shortage if there is a dentist to population ratio greater than

²⁰ What are Federally qualified health centers (FQHCs)? [Internet]. Hrsa.gov. 2016 [cited 2016 Feb 12]; Available from: <http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Introduction/qualified.html>

²¹ Shortage Designation: Health Professional Shortage Areas & Medically Underserved Areas/Populations [Internet]. Hrsa.gov. 2016 [cited 2016 Feb 11]; Available from: <http://www.hrsa.gov/shortage/>.

1:5,000. There were 4,000 mental health HPSAs, which were determined if the ratio of mental health providers to population exceeded 1:30,000. Mental health providers include psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists. HPSAs can also be designated based on poverty level and geographical criteria.

Rhode Island has only one HPSA based on geographical location (New Shoreham, on Block Island). HPSAs for a geographical location are designated based on distance to a healthcare center, with the maximum travel time not to exceed 30 minutes.²² In Rhode Island, which is largely connected via Interstate highways, it is not difficult to traverse the entire contiguous land area within that time constraint. Unfortunately, for individuals living in rural areas of the state, that criterion doesn't have much practical utility. Washington County has also been designated as a mental health HPSA, based on a geographic high need.

A HPSA designation helps with workforce recruitment and retention, and helps to support a growing network of providers in the immediate, underserved area. Without a HPSA designation, rural areas will likely continue to experience a deficit in providers, thus making continuous, equitable care a further challenge for rural residents.

Related to HPSAs is the designation of "Medically Underserved Area" (MUA). The criteria for establishing an area as medically underserved are extensive, but one facet includes income and other socioeconomic demographics. In Rhode Island, three rural towns are classified as MUAs on the basis of income: Glocester, Foster, and Burrillville.

Transportation System

Lack of transportation is a consistent barrier to healthcare in rural communities throughout the United States. Rhode Island is served by statewide public transport, called the Rhode Island Public Transit Authority (RIPTA). The RIPTA bus operating system, is very urban-centric. The majority of the RIPTA bus routes exist within urban service boundaries, and most rural towns have only one bus route through the area. Rural areas Foster, New Shoreham, Little Compton and Charlestown have no RIPTA bus routes within the town boundaries.

In Rhode Island, a few programs, such as the Flex service and the RIdE program, have begun to address some of these barriers. The Flex Service is designed to serve the unmet mobility needs of certain communities across Rhode Island.²³ The Flex vehicle travels in geographically zoned areas, usually in an urban or rural community with no regular bus route. Individuals have the option of calling the Flex vehicle 48 hours in advance in order to make a reservation for the service. The Flex service attempts to connect individuals from isolated communities to more serviced areas in order to facilitate mobility and transportation. The RIdE program, which also requires reservations, is the paratransit service that assists individuals who are unable to travel on the RIPTA buses or are unable to make it to a designated bus stop as a result of a disability.²⁴

While the Flex Service and the RIdE program facilitate transportation for many rural residents, they still do not adequately meet the needs of all rural communities. Assessments by

²² Primary Medical Care HPSA Designation Criteria [Internet]. Bhpr.hrsa.gov. 2016 [cited 2016 Feb 12]; Available from: <http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/primarycarehpsacriteria.html>

²³ RIPTA Flex Service. Accessed 12 February 2016. <http://www.ripta.com/flex-service>

²⁴ RIPTA RIdE Service. Accessed 12 February 2016. <http://www.ripta.com/ride-1>

non-profits in Rhode Island, including WellOne,²⁵ CCAP (Comprehensive Community Action Program),²⁶ YWCA Northern Rhode Island,²⁷ and nriAHEC (Northern Rhode Island Area Health Education Center)²⁸ all concluded that transportation issues are one of the biggest challenges facing rural residents. CCAP found that 22% of residents did not get needed healthcare due to transportation concerns.

The cost of RIPTA services is also a barrier for rural residents. For some individuals, particularly those that are low-income, the RIPTA fare is too expensive.²⁹ The primary expense is likely due to the fact that for individuals traveling from rural areas to receive healthcare, multiple buses are required. This is an investment both financially, and in terms of time. Taken together, the inaccessibility of RIPTA routes, the cost associated with using public transportation, and the amount of time it takes to travel from an isolated rural area to a healthcare center discourages rural residents from utilizing the public transportation system. As a result, rural residents often miss appointments, delay their care, and have inconsistent medication management. All of these factors contribute to negative health outcomes.²⁹

²⁵ WellOne. 2010 Rural Health Mini Grant. Foster, RI: WellOne; 2010

²⁶ Comprehensive Community Action, Inc. Rural Health Mini Grant, Coventry Access Survey Results Summary. Cranston, RI. Comprehensive Community Action, Inc.; 2011

²⁷ YWCA Northern Rhode Island and Northern Rhode Island Area Health Education Center. Addressing Prenatal Care & Food Insecurity for Young Women Living in Rural Northwestern Rhode Island. Woonsocket, RI: YWCA Northern Rhode Island and Northern Rhode Island Area Health Education Center; 2011.

²⁸ nriAHEC: About Us [Internet]. Northernriahec.org. 2016 [cited 2016 Mar 10]; Available from: <http://northernriahec.org/about.shtml>

²⁹ Syed ST. Traveling towards disease: transportation barriers to health care access. *Journal of Community Health*. 2013 Oct; 38(5): 976 – 993.

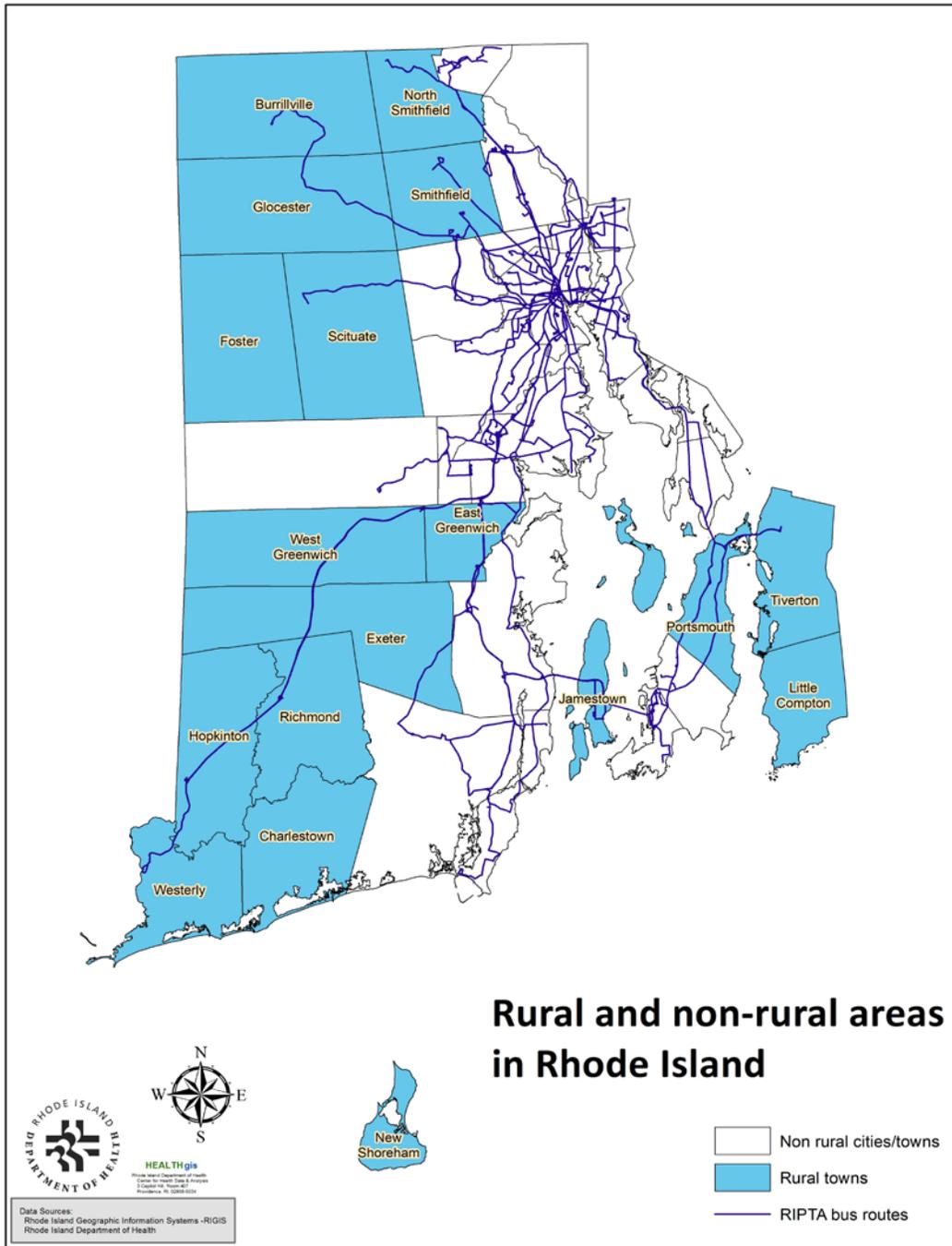


Figure 4. RIPTA bus routes and rural areas.

Healthcare Utilization

Healthcare utilization, which can be assessed by the frequency of use of medical services, is an important trend in creating healthy communities. Utilization levels may be determined by a number of factors, including the supply of providers and services, changes in healthcare patterns, changes in consumer preferences, and changes in the sociodemographic patterns of a population (e.g. like a growing elderly population, or an increased number of individuals with insurance coverage).³⁰ Healthcare utilization encompasses access to many different types of care, including dental health, mental and behavioral health services, primary and preventative care, hospitalizations, emergency department use, and Veteran's health services. Measures of healthcare utilization also seek to assess the quality and efficiency of medical care.

In rural areas specifically, consistent healthcare utilization is often difficult, due to a number of factors including transportation, availability, accessibility, and cost. The following section explores healthcare utilization in the rural Rhode Island towns.

Health Insurance

Health insurance is an important component of overall health and well-being. Without health insurance, it is difficult to receive adequate, consistent preventive and primary care services, and it may be difficult to pay for follow-up care after a serious medical emergency. Health insurance, especially under the Affordable Care Act, helps to increase access to healthcare by making it more affordable – including for middle-class individuals and those with pre-existing conditions, both of whom have had a historically difficult time paying for coverage.³¹

Of the individuals living in rural towns across Rhode Island, 92.1% indicate that they have some kind of healthcare coverage, either through private insurance, prepaid plans, or a government plan like Medicare, Medicaid, or Indian Health Services.³² In urban areas, 87.1% of individuals are insured. Rural residents traditionally have lower rates of employer-based insurance coverage when compared to individuals living in urban communities, and higher rates of Medicaid and Medicare coverage.³³ It is important to remember that the reported average insurance coverage may not adequately represent the variability across Rhode Island's rural

³⁰ Healthcare in America: Trends in Utilization. [Internet] CDC 2015 [cited 2016 Feb 15]; Available from: <http://www.cdc.gov/nchs/data/misc/healthcare.pdf>

³¹ Olivero, Magaly. Why do I need health insurance? [Internet] U.S. News 2013 Aug 13 [cited 2016 Feb 29]; Available from: <http://health.usnews.com/health-news/health-insurance/articles/2013/08/16/why-do-i-need-health-insurance>.

³² Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014

³³ The ACA and Insurance Coverage in Rural Areas. [Internet]. Kaiser Family Foundation 2014 [cited 2016 Feb 16]; Available from: <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/health-insurance-coverage-in-rural-america-pdf.pdf>

areas; depending on the proximity to an urban area, insurance coverage can significantly vary.³⁴ For example, the health insurance rates in rural areas vary from 1.0% not having any kind of health insurance coverage in Jamestown, and up to 17.4% of individuals having no coverage in Charlestown.^{29, 32}

Across the state, 104,532 children receive some sort of government medical assistance, including Medicaid and assistance through the Children's Health Insurance Program (CHIP). Of these children receiving governmental assistance, 8.6% of them live in a rural area.³⁵

Oral Health

Oral health is a constant challenge in rural communities across the nation. Barriers include geographic isolation, lack of adequate transportation, provider shortages, and a lack of fluoridated community water supply.³⁶ Additionally, due to low reimbursement rates for services, many dental providers don't take Medicaid or CHIP patients, or have reached the maximum number of patients, making dental access even more challenging for low-income individuals. Furthermore, because Medicare often doesn't include dental benefits and most elderly adults are retired, dental care can be extremely difficult to manage financially for older individuals. As rural areas often have a larger population of older adults, oral health service utilization can be especially challenging.

In Rhode Island specifically, approximately 78.1% of individuals living in a rural area have visited a dentist in the past year. However, in some rural communities, the number of individuals visiting a dentist within the past year is as low as 69.1% (in Exeter). Interestingly, only 70.1% of individuals living in an urban town or city have visited a dentist in the past year, indicating that rural residents may be accessing oral health services on a more consistent basis when compared to urban residents.

Behavioral and Mental Health

While there are no town and city level data available that attest to the utilization rates of mental health services in urban and rural areas across Rhode Island, a median number of 1,717 individuals accessed mental health services, defined as visiting a small practice psychologist or a licensed behavioral health clinic, in Rhode Island in 2014.³⁷ The average patient load for a psychiatrist in Rhode Island is 1,151 patients. Of individuals in Rhode Island accessing mental healthcare, 45.1% used Medicaid as their primary form of payment. For individuals accessing mental health services from psychologists and psychiatrists, 5.3% use Medicaid as a primary

³⁴ Health Insurance Coverage in Rural America. [Internet]. Kaiser Family Foundation 2003 [cited 2016 Feb 16]; Available from: <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/health-insurance-coverage-in-rural-america-pdf.pdf>

³⁵ RI Kids Count Factbook [Internet]. Rikidscount.org 2016 [cited 2016 Feb 17]; Available from: <http://www.rikidscount.org/DataPublications/RIKidsCountFactbook.aspx>

³⁶ RHI Hub - Oral Health in Rural Communities. Accessed 2016 Feb 17. Available from: <https://www.ruralhealthinfo.org/topics/oral-health>

³⁷ Long, et al. Rhode Island Health Planning Inventory Report: Utilization and Capacity Study [Internet]. Rhode Island Department of Health 2015 [cited 2016 17 Mar]; Available from: <http://www.health.ri.gov/publications/reports/2015HealthInventory.pdf>

form of payment, and 16.3% of psychiatrists and 56.3% of psychologists reported that they are accepting new Medicaid patients. Of the 290 psychiatrists that are currently practicing in Rhode Island, 23 (7.9%) provide services in a rural community. When surveyed, Rhode Island residents indicated that the ability to utilize mental health services more efficiently is a primary concern. In *Rural Health People 2020*, access to quality behavioral and mental health services was cited as an area of work needing drastic improvements across the nation.

Primary and Preventative Care

The consistent use of primary and preventative care is important to maintain the health of a population. On average, with increased primary care utilization, serious medical conditions can be addressed early on, leading not only to improved health outcomes but also to decreased overall medical expenditures and increased productivity in the population. In many rural areas across the country there is a severe primary care physician shortage. Compounded by the pervasive lack of inpatient and outpatient facilities in rural American towns, many rural communities face severe barriers accessing primary and preventive care.

Of course, utilization is directly linked to access. In Rhode Island, healthcare utilization varies significantly, along both the urban and rural continuum and between individual towns and cities. A key component in evaluating utilization is assessing the experiences of individuals who are using the primary care services; or, in other words, are the utilization experiences positive? Do standard practices need to be changed in order to better address the needs of the community and increase overall utilization?

Statewide, 15.5% of Rhode Island residents felt that the office hours at medical facilities were not convenient for them. The top concerns from Rhode Islanders in regards to primary and preventive care include making healthcare more affordable, increasing access and utilization to health care, and expanding public transportation. Clearly, the experiences of at least some individuals across the state have been negatively impacted by problems facilitating utilization.

In Rhode Island's rural towns, the biggest issue for adequate healthcare utilization is not being able to secure an appointment with a primary care provider soon enough. 7.4% of individuals in rural areas feel that this is a major issue in their utilization of primary care services. Other problems include having to wait too long to see a doctor once they have an appointment, and not having reliable transportation to get to a doctor's office.

Emergency Medical Services

The RIDOH Center for Emergency Medical Services, CEMS, is an important part of the RIDOH's Center for Emergency Preparedness and Response, and is responsible for developing a comprehensive statewide plan for emergency medical services and for establishing standards for trainings and licensing.

Additionally, in an effort to improve the overall delivery of emergency medical services, CEMS collects, analyzes, and disseminates data to many external partners, including the National EMS Information System, the Governor's Overdose Prevention and Intervention Task Force, the Rhode Island Department of Transportation, and the Center for Disease Control and Prevention.

Ambulance run data is especially useful, as it points to the efficiency of service delivery, helps to identify common trends in the reasons for ambulance calls, and can be used to track geographic hotspots. In an overview of the ambulance run data for rural towns, the five most common reasons for calling the ambulance were 1) abdominal pain, 2) behavioral or psychiatric concerns, 3) chest pain, 4) respiratory distress and 5) weakness. Furthermore, many calls were cited as “no apparent illness/injury” upon ambulance arrival. The reasons for ambulance calls were consistent across both urban and rural communities.

In 56% of our rural areas, there is just a volunteer or combination of part-time and volunteer EMS. This affects delivery of care, especially in inclement weather conditions. Block Island faces unique EMS challenges. On Block Island, the EMS Department is entirely volunteer. All ten members have basic life support training, with the exception of one individual who has his or her advanced EMT. The 800 megahertz radio communication that is used with the mainland also continues to be problematic on the western part of the island. Because of internet infrastructure, Block Island does not have the capacity for the state-wide patient tracking system to be loaded onto their own servers, which delays communication with mainland Rhode Island about a patient’s status, medications, and prognosis.

Further, getting individuals who require advanced care physically off the island is a great barrier. Block Island has no helipad or boat evacuation services. They have to rely on an area hospital or Lifestar to fly over, and in inclement weather evacuation could be seriously delayed or postponed. In rare instances, the Coast Guard has been asked to step in, but approval can take up to two to three hours. In the off-season, EMS faces only about three runs a month, but during the summer this increases to over 110 a month. There are no additional EMS staff hired in the summer and traffic around the island and increased injuries cause EMS to be short staffed. This is especially true when EMS uses the ferry to transport an individual to the mainland, as there is one less service vehicle on the island. If the ferry does not return that same night after a late run, the EMS vehicle may not return until the following day.

Veterans’ Health Services

The Providence VA Medical Center serves the entire state of Rhode Island and Southeastern Massachusetts.³⁸ It has 73 operating beds, and provides primary care and specialty services. While the Medical Center is located in Providence, the capital city, there are three VA-Community-Based Outpatient Clinics that provide basic medical services and patient support. Two of these outpatient clinics are located in Massachusetts, and the third is located in Newport, RI. While Newport is not considered a rural area, the location facilitates VA healthcare access for the rural areas in the Southern part of the state, including those close to Newport (Tiverton, Little Compton, Portsmouth, and Jamestown).

³⁸ Providence VA Center. Accessed 2016 Mar 3. Available from: www.providence.va.gov.

Health Related Behaviors and Health Risks

While illness was originally thought to primarily be the result of genetics or infection, it is now widely understood that a myriad of factors play a role in health, wellness, and disease. There are very few diseases that have a single, discrete cause, and a person's general health is "intrinsically linked to biological, lifestyle, social, and environmental factors."³⁹

One of the most modifiable factors is an individual's behavior; often, in an attempt to improve health, behavior change is an effective target. Several behaviors exert a strong influence on health, including tobacco use, alcohol consumption, physical activity and diet, sexual practices, and disease screening.⁴⁰ Health behaviors, including risky behaviors, are any action undertaken by an individual that impacts his or her health. Some behaviors are dramatic, with immediate effects, while others are performed over a period of time and result in an accumulated impact.

It is also important to note that sometimes, health behavior is outside of an individual's exclusive control. It is now widely accepted that an individual's social position plays a large role in overall health, and the social factors that contribute to behavior include socioeconomic status, social support and networks, occupational stress and hazards, unemployment and retirement, and social capital.³⁴ These social determinants of health directly impact an individual's ability to change his or her own behavior, and the ease by which that change can occur.

In general, rural individuals engage in risky health behaviors at a higher rate than their urban counterparts. Specifically, rural residents are more likely to smoke, abuse alcohol and other substances, be physically inactive, be overweight, and have poorer access to healthy foods.⁴¹

Exercise and Weight

Physical activity and exercise are an important part of a healthy lifestyle. High rates of physical inactivity are related to an increased risk in cardiovascular disease, obesity, and other chronic illnesses. In urban areas across Rhode Island, 74.0% of the adult population indicated that they engaged in some sort of physical activity, other than their jobs, at least one time during the past month. In rural areas, 79.8% of individuals participated in some sort of physical activity. However, in some rural municipalities, the rates of exercise are as low as 69.7% (in North Smithfield, specifically).

Weight is also an important factor in overall health. Obesity contributes to an array of health problems, including diabetes, cardiovascular disease, and sleep disorders.⁴² In rural areas, 37.0% of individuals indicate that they are overweight, compared to 36.2% in urban areas. 23.5% of rural residents are obese, compared to 28.1% of urban individuals. Overweight and obesity

³⁹ Australian Institute of Health & Welfare. Accessed 2016 Feb 29. Available from: www.aihu.gov.au

⁴⁰ Chapter 3. In: Health and Behavior: The Interplay of Biological, Behavioral, and Societal Influences. The National Academies Press; 2001.

⁴¹ RHI Hub – Rural Obesity Toolkit. Accessed 2016 Apr 5. Available from: <https://www.ruralhealthinfo.org/community-health/obesity/1/understanding-obesity>

⁴² National Heart, Lung, and Blood Institute - What are the health risk of overweight and obesity? Accessed 2016 Apr 5. Available from: <http://www.nhlbi.nih.gov/health/health-topics/topics/obe/risks>

measures were calculated using self-reported height and weight measurements from the Behavioral Risk Factor Surveillance System, so there may be systematic measurement error in these percentages.

Personal Safety

Affecting people of all races, genders, and classes, personal injury is considered to be a public health epidemic. It is the fourth leading cause of death for Rhode Islanders of all ages, and the first leading cause of death and disability for Rhode Islanders ages one to 44.⁴³ In RI, there are an average of 600 injury deaths annually, and nearly 6,000 hospitalizations.

“Injury” means any damage or harm to the body that results in an impairment or destruction of health. Injuries can result from a number of things, including motor vehicle crashes, unintentional falls, suicides, and drug overdoses.⁴³ The losses sustained from injury are multifold, and include economic burdens, loss of productivity, the emotional strain for friends and loved ones, and the personal impacts of an injury that lead to a severe disability. Accidental injury is consistently named a priority in *Rural Healthy People* publications, and is the focus of many state, local, and national public health agencies.⁴⁴ Despite the importance, there are currently no data available to assess the injury prevalence rates in urban and rural areas across Rhode Island.

Drug Overdoses

Currently, the most threatening risk to personal safety in Rhode Island is the drug and opioid epidemic. Since 2005, the number of drug poisoning deaths has exceeded the number of deaths from motor vehicle crashes, falls, firearms, and fire combined.⁴³ In 2015, 239 Rhode Islanders died from an accidental opioid overdose and the predictions for 2016 show that number is climbing. The overdose epidemic is a statewide issue, but rural areas that are particularly impacted include East Greenwich, Hopkinton, and Burrillville. In these three towns, the rate of opioid deaths exceeded 40-50 deaths per 100,000 individuals.

Pregnancy-Related Risks

WIC Participation

The Women, Infants, and Children (WIC) program supplies supplemental nutritious food, nutrition education and counseling, and screening and referrals to other health providers for eligible participants.⁴⁵ The WIC program primarily serves low-income families, and provides services throughout pregnancy and up until the child’s fifth birthday. Overall, the benefits of

⁴³ Preventing Violence and Injuries in Rhode Island [Internet]. Rhode Island Department of Health 2013 [cited 2016 May 2]; Available from: <http://health.ri.gov/publications/plans/2013InjuryPrevention.pdf>

⁴⁴ Alexander J and Castillo G. Injury Violence and Prevention in Rural Areas: A literature review. 2003. Available from: srph.tamhsc.edu.

⁴⁵ WIC – At a Glance. Accessed 2016 Mar 15. Available from: <http://www.fns.usda.gov/wic/about-wic-wic-glance>

WIC participation are vast, and “participation has been shown to reduce infant mortality, improve birth outcomes, enhance maternal and child dietary intake, reduce child abuse and neglect risk, improve child growth rate, boost cognitive development, and increase the likelihood of having a regular source of medical care.”⁴⁶ WIC participation is incredibly important in ensuring the health and well-being of the maternal and child populations.

Across the state of Rhode Island, 65.0% of WIC-eligible families participate in the program, however, in rural areas, only 42.3% of eligible families are participating.

Delayed Prenatal Care

Delayed prenatal care is defined as those women who begin prenatal care in the second or third trimester of pregnancy or receive no prenatal care at all.⁴⁶ Prenatal care, and specifically early prenatal care, is an important factor in the health and wellbeing of mother and baby. Adequate prenatal care helps to influence and modify behaviors that have the potential to compromise fetal development, infant health, and maternal health.⁴⁶ In 2015, 12.7% of pregnant women in Rhode Island had delayed prenatal care. Of these, 7.5% of women lived in a rural area.

Maternal Tobacco Use

Maternal tobacco use is a national issue, with approximately 10% of women reporting tobacco use in the last three months of pregnancy.⁴⁷ Smoking during pregnancy causes many problems for mother and baby, including a heightened risk of premature birth, low-birth-weight, birth defects, and Sudden Infant Death Syndrome. Tobacco use also causes problems with the placenta, which, in some cases, is fatal to both the mother and the child. In Rhode Island, the average maternal smoking prevalence is 8.3%. In urban areas, 8.4% of pregnant women smoke, compared to 8.1% in rural communities.

Environmental Health

Radon

Radon is a colorless, odorless gas that comes from the natural decay of uranium in the air and in the soil. Radon can seep into homes, creating dangerously high levels that may lead to lung cancer and other diseases. While there is no “safe” level of radon, the Environmental Protection Agency recommends action at 4.0 pCi/L (pico-Curies per Liter).

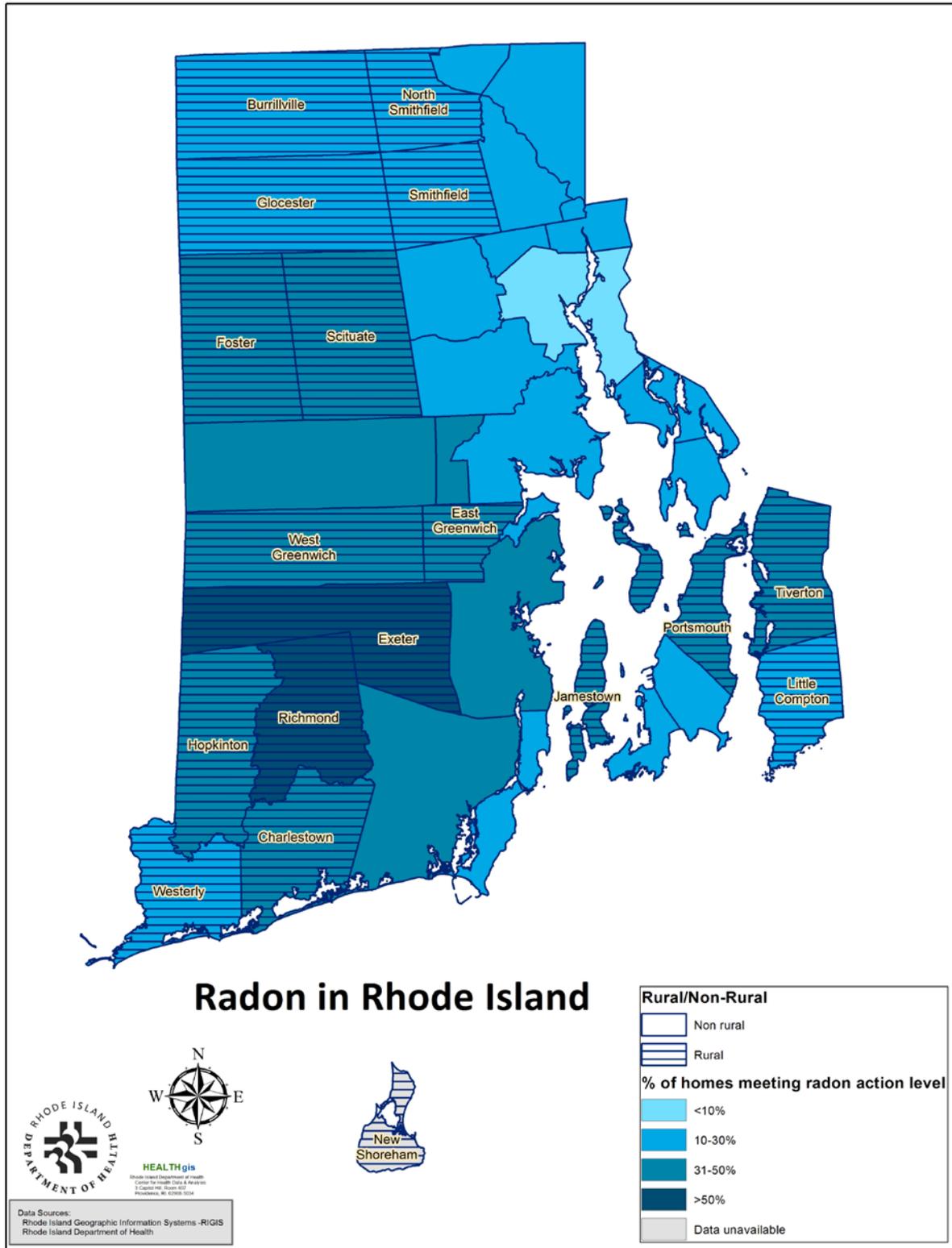
In Rhode Island, one in four homes test at or above 4.0 pCi/L,⁴⁸ and many of these homes are located in a rural community. In Exeter and Richmond, over 50% of the homes test equal or greater to the EPA Action Level for radon. In other rural areas, like Hopkinton, Charlestown,

⁴⁶ RI Kids Count Factbook [Internet]. Rikidscount.org 2016 [cited 2016 Feb 17]; Available from: <http://www.rikidscount.org/DataPublications/RIKidsCountFactbook.aspx>

⁴⁷ Tobacco Use and Pregnancy [Internet]. CDC [cited 2016 Jun 22]. Available from: <http://www.cdc.gov/reproductivehealth/maternalinfanthealth/tobaccousepregnancy/>

⁴⁸ Some Facts about Radon. Rhode Island Department of Health. – Healthy Homes and Environment Team.

West Greenwich, East Greenwich, Portsmouth, Tiverton, Foster, and Scituate, 31% – 50% of the homes test positive for dangerously high levels of radon gas.



Lead

Lead is a highly toxic metal that was previously used in many products, including paint, ceramics, pipes and solders, gasoline, batteries, and cosmetics. However, as the toxicity and dangers associated with lead became more widely known, governmental action has attempted to reduce individual lead exposure in order to protect overall health and well-being.

In many areas, and specifically in Rhode Island, the most common sources of lead exposure are lead-based paint in older homes, household dust, and drinking water.⁴⁹ To some degree, the inhalation of lead fumes in the workplace also contributes to elevated blood lead levels. In 2012, 31 adults in Rhode Island had elevated blood lead levels, and all cases were attributed to lead inhalation in an occupational setting.

For children, the largest area of concern is in the household setting. Children under the age of six are at a particularly high risk for exposure. The Centers for Disease Control and Prevention defines any blood lead level greater than 5 micrograms per deciliter as a level of concern. Prolonged elevated blood lead levels can have a number of long-term health consequences, including neurological problems.

Major cities in Rhode Island, like Providence, Central Falls, and Newport, have consistently higher childhood prevalence rates of blood lead levels that exceed the CDC's recommendations. However, many rural areas, including Burrillville, Glocester, Hopkinton, Westerly, Charlestown, Tiverton, Little Compton, and Middletown have elevated blood level prevalence rates between 3.0% - 5.9%.

Adolescent Behavior

High school students living in rural towns have some of the highest rates of exposure to youth violence in the state.⁵⁰ Three rural towns, Tiverton (12%), Foster (10%), and Glocester (10%), ranked among the top 10 towns with the highest percentage of high school students reporting having been in a fight within the last year. The Rhode Island state average was 9%. Additionally, the rural towns of Charlestown (24%), Hopkinton (24%), Richmond (24%), Foster (20%), and Glocester (20%) were among the towns in the state with the greatest prevalence of high school students who witnessed another student bring a weapon to school in the past year. These rates were all higher than the state prevalence of 16%.

Teens living in rural towns also report some of the highest rates of alcohol, drug, and cigarette use in the state. According to 2013-2014 surveys, 30% of East Greenwich students and 29% of Burrillville students reported having drunk alcohol in the last 30 days. These rates are among the highest in the state and greater than the state average of 26%. Additionally, the towns of Tiverton (40%) and Burrillville (35%) were among the towns with the highest rates of teens reporting having ever used marijuana. These rates are greater than both state (34%) and national averages (30%). Rates of current cigarette smoking among high school districts Charlestown, Richmond, and Hopkinton (13%), Tiverton (12%), Burrillville (11%), and Foster-Glocester (11%) were among highest in the state. These rates were greater than the statewide rate of 9%.

⁴⁹ Healthy Housing Databook, 2012. Rhode Island Department of Health, pg. 38-55.

⁵⁰ RI Kids Count Factbook [Internet]. Rikidscount.org 2016 [cited 2016 Feb 17]; Available from: <http://www.rikidscount.org/DataPublications/RIKidsCountFactbook.aspx>

Health Outcomes and Status

Rural Americans are a population group that experience significant health disparities.⁵¹ Health status disparities in chronic disease and disability prevalence can often be attributed to differences in health and risk behaviors, but there is also a social, economic, and cultural component.⁵¹ Rural communities, both nationally and within Rhode Island, are fundamentally different from urban cities in their challenges and strengths. A plan to address geographic health status disparities must include tailored initiatives that address the unique needs of each municipality.

Nationally, rural communities have higher rates of low-birth-weight infants, births to teenage mothers, children who are overweight or obese, diabetes, and preventable hospital stays.⁵² The mortality rates in urban and rural communities are also strikingly different; in rural towns, death rates from unintentional injuries increase greatly as areas become less urban, and the mortality rates from cardiovascular disease and respiratory distress are much greater in rural towns compared to urban cities.⁵²

Some scholars believe that “living in a rural area is in itself a health risk factor due to numerous associated factors that adversely influence health and access to healthcare.”⁵² However, with a focused research agenda, the overall health status of rural community members can be vastly improved not just in Rhode Island, but also throughout the country.

Encouragingly, in Rhode Island specifically, rural residents are only 11% likely to rate their general health as fair or poor, compared to an urban response of 17%. Approximately 22% of rural residents would classify their general health as excellent, compared to only 17.7% of urban-dwelling individuals.⁵³

Cancer

There are over 100 different kinds of cancer, and each type is characterized by the abnormal growth of cells that invade other, healthy tissues.⁵⁴ Cancers are usually named for the organ in which the malignant growth starts (e.g. breast cancer begins with unregulated cell growth in the breast tissue). Cancer is largely thought to be caused by a unique mix of genetic and environmental factors; more research must be done to better understand the complex balance of cancer determinants.

In Rhode Island, 484 people per 100,000 have been diagnosed with cancer. About 13.0% of rural residents in Rhode Island have been diagnosed with cancer. In urban areas across the

⁵¹ RHI Hub – State Cancer Profiles. Accessed 2016 18 Mar. Available from: <https://www.ruralhealthinfo.org/search/results?q=cancer>

⁵² Bridging the Health Divide [Internet]. University of Pittsburgh Center for Rural Health Practice. 2004 [cited 2016 Mar 18]; Available from: https://www.upb.pitt.edu/uploadedFiles/about/Sponsored_Programs/Center_for_Rural_Health_Practice/Bridging%20the%20Health%20Divide.pdf

⁵³ Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014

⁵⁴ National Institute of Cancer. Accessed 2016 15 Mar. Available from: www.cancer.gov

state, 11.4% of individuals indicated that they had received a diagnosis. In some rural areas, like Tiverton and East Greenwich, the cancer prevalence is as high as 16.0% and 16.6%, respectively. In the town of New Shoreham, on Block Island, the cancer prevalence is 25.1%; however, it should be noted that the sample size used for this estimate was very small, which could contribute to measurement error.⁵⁵

Chronic Disease

Diabetes

Excluding gestational diabetes, 10.2% of urban individuals have been told by their healthcare provider that they have diabetes, compared to 7.0% of rural residents. Looking at specific rural towns, the prevalence of diabetes ranges from 2.9% in East Greenwich to 12.4% in Hopkinton.

Heart Disease

Heart disease is the leading cause of death in the United States.⁵⁶ Traditionally, rural areas have a higher prevalence of heart disease in the population because of lower rates of physical activity and higher rates of poverty, obesity, and other risk-behaviors.

In Rhode Island's urban areas, 4.2% of individuals have been diagnosed with angina or coronary heart disease; this is compared to 3.9% of individuals in rural towns. The prevalence of stroke in rural and urban communities was similar, 2.3% and 2.6%, respectively.

In both rural and urban areas across the state, less than 5% of the population had ever been told by a healthcare provider that they had experienced a heart attack (myocardial infarction).⁵⁵

Asthma

Nationally, 7.4% of adults have been diagnosed with asthma, and the number of diagnoses continues to increase each year.⁵⁷ In the United States, over one million cases in the Emergency Room are classified with asthma as the main cause. Asthma-related incidents cost the United States over \$56 billion dollars in medical costs each year, including reduced productivity. Asthma also directly influences an individual's overall quality of life.

The prevalence of adult asthma in Rhode Island is well above the national average.⁵⁷ In Rhode Island, 16.2% of individuals indicate that they have been diagnosed with asthma. In rural areas, this number is even higher, with 17.5% of individuals claiming to have been diagnosed.

⁵⁵Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014

⁵⁶ Knudson, Alana. Rural and Urban Disparities in Heart Disease [Internet]. Rural Health Reform Policy Research Center. 2014 [cited 2016 Mar 17]; Available from: <https://ruralhealth.und.edu/projects/health-reform-policy-research-center/pdf/rural-urban-disparities-in-heart-disease-oct-2014.pdf>

⁵⁷ Asthma Data – RIDOH. Accessed 2016 Mar 15. Available from: <http://www.health.ri.gov/data/asthma/>

Disability

The World Health Organization defines disability as an umbrella term, which encompasses impairments, activity limitations, or participant restrictions for an individual.⁵⁸ Importantly, in recent years disability has come to be recognized as more than just a health problem; it is a “complex phenomenon reflecting the interaction between features of a person’s body and features of the society in which he or she lives.”⁵⁸ In Rhode Island, disability prevalence, the social determinants of disability, and the health status of persons with disabilities are tracked by RIDOH’s Office of Special Health Care Needs in an effort to reduce health disparities that exist between Rhode Island adults with a disability and those Rhode Island adults without a disability.⁵⁹ In 2014, 19% of Rhode Island adults indicated that they had a disability through the BRFSS survey.⁶⁰

In urban areas, 24.4% of individuals indicated they had a disability, compared to 19.6% in rural areas.⁶¹ It should be noted that in some of the rural communities, disability rates exceed that of urban areas; for example, in Tiverton, 26.7% of individuals are living with a disability.

Mental and Behavioral Health

The Centers for Disease Control and Prevention uses an index of “Frequent Mental Distress” to identify mental illness.⁶² In the BRFSS, if survey participants report having experienced 14 or more days in the last 30 days when their mental health was not good, they are considered to be experiencing Frequent Mental Distress. Frequent Mental Distress indicates the possibility of a diagnosable mental illness, which directly impacts an individual’s health, happiness, and overall well-being.

In rural Rhode Island, 10.4% of the population was found to have Frequent Mental Distress. This is compared to 11.4% in the urban population.

The most common form of mental illness in the United States is depression, which affects an estimated 26% of the population. It is believed that by the year 2020, depression will be the second leading cause of disability, second only to heart disease.⁶⁰ In Rhode Island, 21.9% of urban residents reported having been told that they have depression, major depression, dysthymia, or minor depression by a healthcare provider. Similarly, 20.3% of rural residents indicated that they had received a depressive disorder diagnosis. In Burrillville, 28.6% of individuals reported having an official depression diagnosis from a provider, exceeding the state and national averages.

⁵⁸ Disability and Health 2014 Annual Report [Internet]. Rhode Island Department of Health. 2014 [cited 2016 Mar 21]; Available from: <http://health.ri.gov/publications/annualreports/2014DisabilityAndHealth.pdf>

⁵⁹ Special Health Care Needs, Office of. Department of Health [Internet]. Accessed 2016 Mar 21. Available from: http://health.ri.gov/programs/detail.php?pgm_id=105/

⁶⁰ Disability and Health 2014 Annual Report [Internet]. Rhode Island Department of Health. 2014 [cited 2016 Mar 21]; Available from: <http://health.ri.gov/publications/annualreports/2014DisabilityAndHealth.pdf>

⁶¹ Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014

⁶² FAQ – What is your office definition of Frequent Mental Distress? Accessed 2016 Apr 5. Available from: <http://www.cdc.gov/hrqol/faqs.htm#10>

Maternal and Child Health

Preterm Birth

Preterm birth is any birth that occurs before 37 weeks gestation.⁶³ Preterm birth is a significant determinant of infant morbidity; infants born before 37 weeks gestation are at a higher risk than full-term infants for neurodevelopmental, respiratory, gastrointestinal, immune system, central nervous system, hearing, dental, and vision problems.⁶³ In Rhode Island, from 2009 – 2013, 10.7% of the births were preterm. Of the preterm births, 9.9% were among women living in a rural area.

Low-Birth-Weight Infants

Low-birth-weight infants are classified as any baby that weighed less than five pounds, eight ounces (2500 grams) at birth. Low-birth-weight infants are often associated with preterm birth, and low-birth-weight infants have many of the same heightened risks of preterm infants.⁶³ Low-birth-weight is also commonly associated with maternal smoking, poverty, periodontal health, level of educational attainment, violence, stress, prenatal nutrition, and environmental hazards.

During the years 2009 – 2013, 7.6% of infants were classified as low-birth-weight babies. Among these low-birth-weight infants, 9.5% were born to mothers in rural areas.

Breastfeeding

Breastfeeding is an important indicator for both infant and maternal health.⁶³ For the infant, breastfeeding provides optimal nutrition, protects against Sudden Infant Death Syndrome, and decreases the risk of childhood obesity, childhood leukemia, and type 1 and 2 diabetes.⁶³ For the mother, breastfeeding helps to facilitate the bond between her and her child, and it also reduces the risk of breast and ovarian cancer, postpartum depression, and diabetes.⁶³

In Rhode Island, 64% of mothers were exclusively breastfeeding their infant at the time of hospital discharge.⁶³ In rural areas, 79% of mothers were exclusively breastfeeding their infant when they left the hospital after delivery.⁶³

⁶³ RI Kids Count Factbook [Internet]. Rikidscount.org 2016 [cited 2016 Feb 17]; Available from: <http://www.rikidscount.org/DataPublications/RIKidsCountFactbook.aspx>

Data Strengths and Challenges

The data represented in this report have been pooled from many different sources, and reflect perspectives from the federal government, statewide assessments, and local non-profits and programs. While this creates a robust picture of rural Rhode Island, it also inherently limits the consistency, which should be taken into account when reading and interpreting the facts and figures. In order to maintain a sense of uniformity and aid in the creation of a cohesive report, the OPCRH intentionally used the Behavioral Risk Factor Surveillance Survey (BRFSS) for nearly all measures.

In some cases, particularly when the data come from BRFSS and are presented at the municipal level, the sample sizes are small. Even after combining multiple years of the survey, the limited number of responses can affect the overall reliability and validity of the measurements. This is a common problem for rural data. When data are assessed through CDC surveys and briefs, it is rare to have city- and town-level data; therefore, an overall comparison between state and national measurements is sometimes necessary.

It is also difficult to assess some of the key determinants of health, especially those related to social and cultural factors, and those related to the overall quality of life. While some questions can approximate the social and environmental determinants of health, there is no set statistical formula that is appropriate for definitive conclusions. Rather, the data that are presented in this report and discussed through a social determinant framework must be recognized as such. It is important to recognize that “health” is a complex, multifactorial concept, difficult to measure with data alone.

Looking beyond these data and into the general nature of rural communities, it is also crucial to note the diversity between and amongst rural communities. No two rural towns are alike, and this diversity automatically requires tailored solutions to unique challenges. In the same way that a program designed for Providence is unlikely to be successful in Central Falls, a program designed for all of the rural towns in Rhode Island will not meet the needs of every community and resident. Communities are comprised of individuals, and taken as a whole, the needs of the individuals will vary not only by urban/rural status, but also by geography, economic stability, and resources.

Recommendations and Next Steps

The overarching goal of the Rhode Island Department of Health is to “positively demonstrate for Rhode Islanders the purpose and importance of public health.”⁶⁴ In order to effectively meet this goal, the Director and the divisions of the Department have established three leading priorities:

- 1. Address the social and environmental determinants of health in Rhode Island*
- 2. Eliminate the disparities of health in Rhode Island and promote health equity*
- 3. Ensure access to quality health services for all Rhode Islanders, including our vulnerable populations*

This report, and resulting portrait of the State’s rural populations, can be used as a tool to help meet these strategic priorities. The report examines the social and environmental determinants of health by describing key health determinants as tangible measures, with a special emphasis on the differences in determinants between urban and rural areas. By emphasizing that the key determinants are measurable, changeable situations, this report can be used as a starting point to develop effective programs, and as a means to strategize effective policy implementation.

This report begins to explore the social and environmental determinants of health by assessing the ease of access to public transportation, the distance to major city centers, food security, and the presence of environmental hazards. Derived from the findings presented in this report, specific recommendations for addressing the social and environmental determinants of health include

- 1. Expanding the RIPTA service boundaries*
- 2. Implementing more farmer’s markets and healthy food options in rural, isolated communities*
- 3. Addressing the threat of radon toxicity in rural homes*
- 4. Continuing to assess and monitor the employment rates, education levels, and socioeconomic statuses of rural communities.*

As a step to ensure access to quality services, especially to vulnerable populations, the report is especially important. In a state like Rhode Island, the rural population is often overlooked; it is assumed that the small square mileage of the state facilitates access to all of the major cities and their resources, thus reducing the social and geographic isolation that rural communities traditionally face. However, “rural” is so much more than geographic distance to a major city center and a lack of accessibility to basic necessities. Rural encompasses a way of living, a close-knit community group, and specific cultural ideals that create a unique, insular municipality. As such, these types of communities face unique challenges, which are often rooted in health disparities.

⁶⁴ Home: Department of Health [Internet]. Health.ri.gov. 2016 [cited 2016 Feb 10]; Available from: <http://www.health.ri.gov/>

To ensure access to quality health services for all Rhode Islanders, future recommendations include

- 1. Increasing the number of primary care, oral, and behavioral health providers*
- 2. Creating comprehensive healthcare delivery across all of Rhode Island's healthcare facilities in order to promote health equity*
- 3. Continuing to work with individuals, including vulnerable populations, to facilitate health literacy and system navigation*

Appendix: References

Primary Care and Rural Health, Office of: Department of Health [Internet]. Health.ri.gov. 2016 [cited 2016 Mar 24]; Available from: http://health.ri.gov/programs/detail.php?pgm_id=27/

Home: Department of Health [Internet]. Health.ri.gov. 2016 [cited 2016 Feb 10]; Available from: <http://www.health.ri.gov/>

Secretary of State, State Facts and Figures [Internet]. 2010. [cited 2016 Feb 10]; Available from: <http://sos.ri.gov/library/history/facts/>

Core Cities Data [Internet]. www.health.ri.gov 2011 [cited 2016 Feb 17]; Available from: <http://www.health.ri.gov/publications/databooks/2011CoreCitiesDataChildhoodLeadPoisoning.pdf>

HHS.gov [Internet]. HHS.gov. 2016 [cited 2016 Feb 7]; Available from: <http://www.hhs.gov/>

Federal Office of Rural Health Policy [Internet]. Hrsa.gov. 2016 [cited 2016 Feb 6]; Available from: <http://www.hrsa.gov/ruralhealth/>

American FactFinder - Community Facts [Internet]. Factfinder.census.gov. 2010 - 2014 [cited 2016 Feb 3]; Available from: http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014.

Provasnik S. Status of Education in Rural America [Internet]. National Center for Education Statistics; 2007 [cited 2016 Feb 11]. Available from: <http://nces.ed.gov/pubs2007/2007040.pdf>

Rural America at a Glance [Internet]. United States Department of Agriculture: 2015 [cited 2016 Feb 12]. Available from: <http://www.ers.usda.gov/media/1952235/eib145.pdf>

Finding Healthcare in Rural Rhode Island [Internet]. Rhode Island Department of Health [cited 2016 15 March]; Available from: <http://www.health.ri.gov/publications/resourcedirectories/FindingHealthcareInRuralRI.pdf>

Long, et al. Rhode Island Health Planning Inventory Report: Utilization and Capacity Study [Internet]. Rhode Island Department of Health 2015 [cited 2016 17 March]; Available from: <http://www.health.ri.gov/publications/reports/2015HealthInventory.pdf>

Medicaid MCO Access Standards: Primary Care. Henry J. Kaiser Family Foundation 2015 [cited 8 February 2016]; Available from: <http://kff.org/other/state-indicator/medicaid-mco-access-standards-primary-care/> (Accessed: 8 February 2016).

Department of Behavioral Health, Developmental Disabilities, and Hospitals: Rhode Island Department of Health [Internet]. Health.ri.gov. 2016 [cited 2016 Mar 24]; Available from: <http://www.bhddh.ri.gov/>

Bolin, Jane et al. Rural Health People 2020 [Internet]. School of Rural Public Health, Texas A&M Health Science Center 2015 [cited 2016 9 Feb]. Available from: <https://sph.tamhsc.edu/srhc/docs/rhp2020.pdf>

Wilson, Will et al. the Future of Rural Behavioral Health [Internet]. National Rural Health Association Policy Brief 2015 [cited 2016 18 Aug].

What are Federally qualified health centers (FQHCs)? [Internet]. Hrsa.gov. 2016 [cited 2016 Feb 12]; Available from: <http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Introduction/qualified.html>

Shortage Designation: Health Professional Shortage Areas & Medically Underserved Areas/Populations [Internet]. Hrsa.gov. 2016 [cited 2016 Feb 11]; Available from: <http://www.hrsa.gov/shortage/>.

Primary Medical Care HPSA Designation Criteria [Internet]. Bhpr.hrsa.gov. 2016 [cited 2016 Feb 12]; Available from: <http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/primarycarehpsacriteria.html>

RIPTA Flex Service. Accessed 12 February 2016. <http://www.ripta.com/flex-service>

RIPTA RIdE Service. Accessed 12 February 2016. <http://www.ripta.com/ride-1>

WellOne. 2010 Rural Health Mini Grant. Foster, RI: WellOne; 2010

Comprehensive Community Action, Inc. Rural Health Mini Grant, Coventry Access Survey Results Summary. Cranston, RI. Comprehensive Community Action, Inc.; 2011

YWCA Northern Rhode Island and Northern Rhode Island Area Health Education Center. Addressing Prenatal Care & Food Insecurity for Young Women Living in Rural Northwestern Rhode Island. Woonsocket, RI: YWCA Northern Rhode Island and Northern Rhode Island Area Health Education Center; 2011.

nriAHEC: About Us [Internet]. Northernriahec.org. 2016 [cited 2016 Mar 10]; Available from: <http://northernriahec.org/about.shtml>

Syed ST. Traveling towards disease: transportation barriers to health care access. *Journal of Community Health*. 2013 Oct; 38(5): 976 – 993.

Healthcare in America: Trends in Utilization. [Internet] CDC 2015 [cited 2016 Feb 15]; Available from: <http://www.cdc.gov/nchs/data/misc/healthcare.pdf>

Olivero, Magaly. Why do I need health insurance? [Internet] U.S. News 2013 Aug 13 [cited 2016 Feb 29]; Available from: <http://health.usnews.com/health-news/health-insurance/articles/2013/08/16/why-do-i-need-health-insurance>.

Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2013 – 2014

The ACA and Insurance Coverage in Rural Areas. [Internet]. Kaiser Family Foundation 2014 [cited 2016 Feb 16]; Available from: <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/health-insurance-coverage-in-rural-america-pdf.pdf>

Health Insurance Coverage in Rural America. [Internet]. Kaiser Family Foundation 2003 [cited 2016 Feb 16]; Available from: <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/health-insurance-coverage-in-rural-america-pdf.pdf>

RI Kids Count Factbook [Internet]. Rikidscount.org 2016 [cited 2016 Feb 17]; Available from: <http://www.rikidscount.org/DataPublications/RIKidsCountFactbook.aspx>

RHI Hub - Oral Health in Rural Communities. Accessed 2016 Feb 17. Available from: <https://www.ruralhealthinfo.org/topics/oral-health>

Providence VA Center. Accessed 2016 Mar 3. Available from: www.providence.va.gov.

Australian Institute of Health & Welfare. Accessed 2016 Feb 29. Available from: www.aihu.gov.au

Chapter 3. In: *Health and Behavior: The Interplay of Biological, Behavioral, and Societal Influences*. The National Academies Press; 2001.

RHI Hub – Rural Obesity Toolkit. Accessed 2016 Apr 5. Available from: <https://www.ruralhealthinfo.org/community-health/obesity/1/understanding-obesity>

National Heart, Lung, and Blood Institute - What are the health risk of overweight and obesity? Accessed 2016 Apr 5. Available from: <http://www.nhlbi.nih.gov/health/health-topics/topics/obe/risks>

Preventing Violence and Injuries in Rhode Island [Internet]. Rhode Island Department of Health 2013 [cited 2016 May 2]; Available from: <http://health.ri.gov/publications/plans/2013InjuryPrevention.pdf>

Alexander J and Castillo G. Injury Violence and Prevention in Rural Areas: A literature review. 2003. Available from: srph.tamhsc.edu.

WIC – At a Glance. Accessed 2016 Mar 15. Available from: <http://www.fns.usda.gov/wic/about-wic-wic-glance>

Tobacco Use and Pregnancy [Internet]. CDC [cited 2016 Jun 22]. Available from: <http://www.cdc.gov/reproductivehealth/maternalinfanthealth/tobaccousepregnancy/>

Some Facts about Radon. Rhode Island Department of Health. – Healthy Homes and Environment Team.

RHI Hub – State Cancer Profiles. Accessed 2016 18 Mar. Available from: <https://www.ruralhealthinfo.org/search/results?q=cancer>

Bridging the Health Divide [Internet]. University of Pittsburgh Center for Rural Health Practice. 2004 [cited 2016 Mar 18]; Available from: https://www.upb.pitt.edu/uploadedFiles/about/Sponsored_Programs/Center_for_Rural_Health_Practice/Bridging%20the%20Health%20Divide.pdf

National Institute of Cancer. Accessed 2016 15 Mar. Available from: www.cancer.gov

Knudson, Alana. Rural and Urban Disparities in Heart Disease [Internet]. Rural Health Reform Policy Research Center. 2014 [cited 2016 Mar 17]; Available from: <https://ruralhealth.und.edu/projects/health-reform-policy-research-center/pdf/rural-urban-disparities-in-heart-disease-oct-2014.pdf>

Asthma Data – RIDOH. Accessed 2016 Mar 15. Available from: <http://www.health.ri.gov/data/asthma/>

Disability and Health 2014 Annual Report [Internet]. Rhode Island Department of Health. 2014 [cited 2016 Mar 21]; Available from: <http://health.ri.gov/publications/annualreports/2014DisabilityAndHealth.pdf>

Special Health Care Needs, Office of. Department of Health [Internet]. Accessed 2016 Mar 21. Available from: http://health.ri.gov/programs/detail.php?pgm_id=105/

Disability and Health 2014 Annual Report [Internet]. Rhode Island Department of Health. 2014 [cited 2016 Mar 21]; Available from: <http://health.ri.gov/publications/annualreports/2014DisabilityAndHealth.pdf>



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