AN ASSESSEMENT OF CONNECTICUT RURAL HEALTH: Overview, Obstacles and Opportunities

CONNECTICUT OFFICE OF RURAL HEALTH
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Prepared for
The Connecticut Office of Rural Health
By

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Executive Summary

Introduction

The purpose of this report is to identify current health related data to guide the strategic direction for the Connecticut - Office of Rural Health (CT-ORH). This data report will also assist the office with prioritizing initiatives and dedicating resources to areas and programs in most need of development to enhance access to quality and affordable health care for rural Connecticut residents.

The methods used to identify data included systematic web-based reviews and contacting key personnel within government and/or non-profit agencies in order to obtain the most recently available data. Data that was identified was typically reorganized and/or reanalyzed in order to most accurately reflect the demographic and health status of the 68 rural towns of Connecticut. Where data was not available at the town level it is presented at the county, regional and/or state level.

Highlights

Demographics

Connecticut has a population of 3,583,561 residents of whom 326,132 (9.1%) live in rural communities. Compared to the rest of the state, in general, rural residents tend to be aged 65 years and older, with the exception of the southwestern region that has more persons less than 20 years of age. With respect to income, rural regions tend to have higher incomes and fewer families living in poverty when compared to the rest of the state, although there are rural towns scattered throughout the state and particularly in the Eastern region with families that are very poor.

Health Care Delivery

Rural areas in Connecticut continue to meet criteria for Health Professional Shortage Areas (HPSAs). There are currently 82 HPSA designations with 41 occurring in primary medical care, 24 in dental care, and 17 in mental/behavioral health. Every county in the state has Medically Underserved Areas or Population (MUA/P) designations with 29 designations covering all or part(s) of 31 towns.

Utilization and Access

The majority of rural residents in Connecticut have health insurance coverage and have access to primary care. Through the efforts of the Affordable Care Act many families have been enrolled in Medicaid/Husky. In 2014, 25,000 residents were covered under Medicaid. With respect to dental care, 15% of rural residents did not seek care or delayed care due to cost.

For those living in rural settings utilizing federally qualified health centers (FQHCs) the rates of hypertension, diabetes and asthma were high and varied by center. Preventive screening for cervical and colorectal cancers varied and were generally low.

Health Related Behaviors

1. Physical Activity and Weight
   Physically inactive and overweight/obese children and adults is a statewide problem and impacts those living in rural settings.

2. Lead Exposure
   Although screening rates for young children is relatively high across the state, there are many rural towns with low screening rates. The rural settings in the eastern region of the state have a high number of confirmed lead tests when compared to other regions.

3. Tick Borne Illnesses
   Lyme disease remains highly prevalent in Connecticut with approximately 3,000 new cases annually, although this number is recognized as a significant underestimate. The rates per 100,000 have increased substantially since 2010 with the rural regions of the state hit the hardest, particularly the eastern region.

4. Behavioral Health
   The prevalence of heavy drinking, binge drinking and tobacco use is high among all counties in the state compared to the nation. For those that receive treatment for mental health and/or substance abuse, there are many more cases from the Eastern region of the state.

5. Pregnancy Related Risks
   Smoking during pregnancy is highest in rural settings in the state particularly the north eastern region.

Health Status

1. Pregnancy and Birth Outcomes
   The rate of births to teenage mothers as well as preterm and low birth weights is highest in Connecticut's largest cities as well as in several rural towns in north and eastern regions of the state.

2. Chronic Disease
   The prevalence of asthma among school-aged children is a major health issue among Connecticut's largest cities as well as in many rural towns throughout the eastern region. Rural residents were more likely to have a self-reported diagnosis of cancer compared to their non-rural counterparts.

3. Mortality
   All-cause and premature mortality rates are slightly higher for the Connecticut river and eastern regions of the state. Heart disease and cancer are the leading causes of death in Connecticut. When compared to the state overall, heart disease mortality is higher across all rural regions of the state. Consistent with self-reported diagnoses of cancer being higher in rural regions, the mortality rates for cancer were reported to be higher in the rural regions of the state.

Introduction

The Connecticut Office of Rural Health (CT-ORH)[1] is located at Northwestern Connecticut Community College (NCCC) in Winsted, CT. The CT-ORH is one of 50 offices across the nation and is federally funded from the Department of Health and Human Services (DHHS), Health Resources and Services Administration (HRSA) through the Federal Office of Rural Health Policy (FORHP). The State Offices of Rural Health (SORH) are neutral conveners of state and local partners, health care providers and communities. The SORHs coordinate and assist with activities to enhance quality, accessible and cost effective health care. The CT-ORH is the steadfast rural voice for those residing in the 68 rural CT towns designated by the CT-ORH. The office is staffed by a director and program manager with guidance and direction provided by an active advisory board to assist with executing the core functions of the federal grant program which include:

"Working together to promote the health of persons living in rural Connecticut through education, communication and partnerships. Focusing on the enhancement, access and promotion of quality healthcare for rural Connecticut."

- To establish and maintain a clearing house for collecting and disseminating information on rural health care issues, research findings and innovative approaches to rural health care delivery
- To coordinate rural health care activities in the state to avoid duplication
- To provide technical assistance to public and non-profit private entities regarding participation in Federal, State and nongovernmental rural health programs

To achieve these core functions the CT-ORH:

- Publishes and distributes an annual report and targeted mailings, creates, updates and maintains electronic list serves and a website
- Convenes and facilitates meetings with various key stakeholders and community groups to initiate or enhance collaborative efforts to maximize the use of limited resources
- Supports rural healthcare evidence-based initiatives
- Provides technical assistance to local, state and community organizations through grant writing reviews, management and searches
- Identifies rural healthcare issues and works to implement appropriate interventions

Purpose

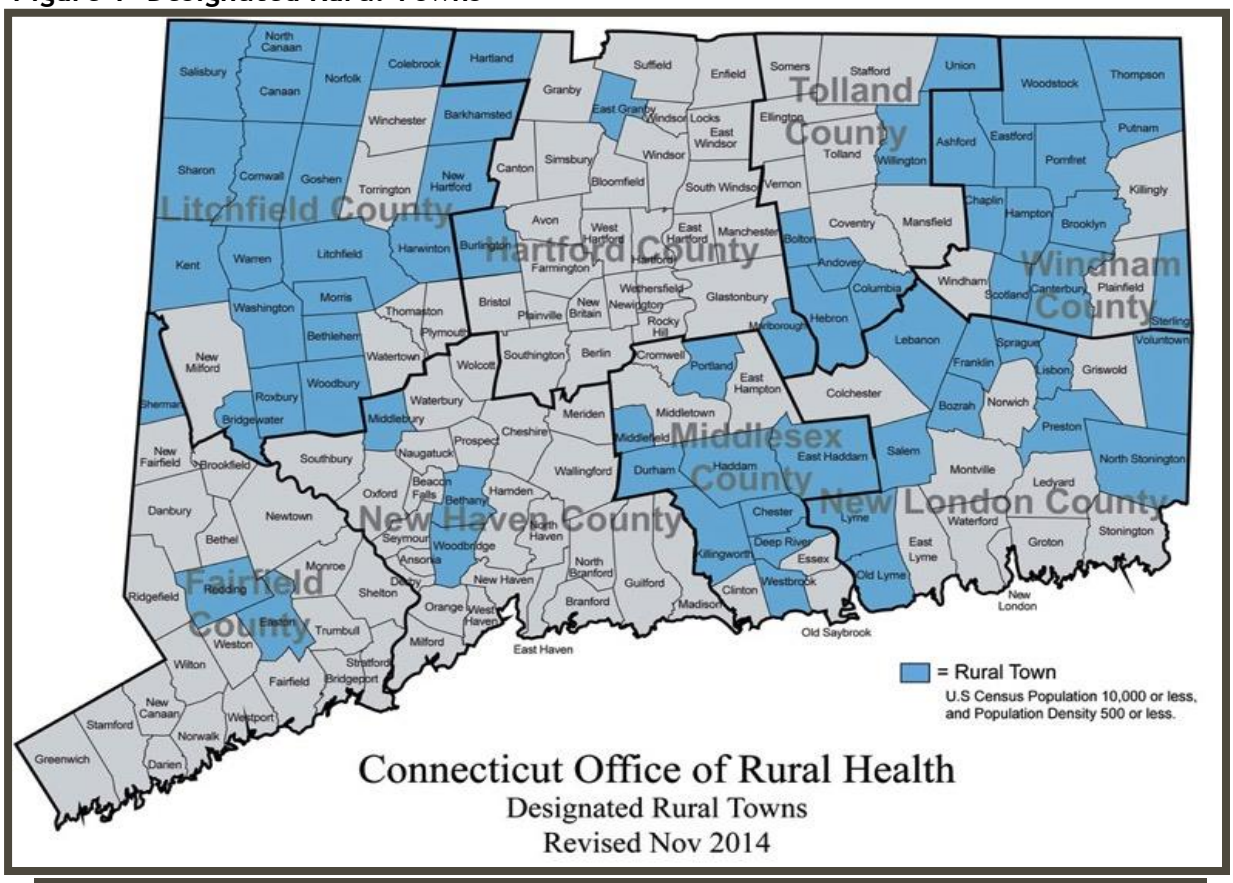
The purpose of this report is to identify current health related data to guide the strategic direction for the CT-ORH. This data report will also assist the office with prioritizing initiatives and dedicating resources to areas and programs in most need of development to enhance access to quality and affordable health care for rural CT residents.

[1] www.ruralhealthct.org

Definition of Rural Health

The Connecticut Office of Rural Health (CT-ORH) definition of rural, adopted by the CT-ORH Advisory Board in November 2014, uses the 2010 U.S. Census Data. All towns with a population census of 10,000 or less and a population density of 500 or less people per square mile, are designated as rural. Using the above definition, the total number of rural Connecticut towns is 68. Below is a map and list of CT rural towns by county.

Figure 1- Designated Rural Towns



County	Town
Litchfield	All towns in Litchfield County are considered rural *except the following towns: New Milford, Torrington, Watertown, Thomaston, Plymouth, & Winchester*
Windham	All towns in Windham County are considered rural *except Killingly, Plainfield & Windham*
Fairfield	Sherman, Redding, Easton
Hartford	Burlington, East Granby, Hartland, Marlborough
Middlesex	Chester, Deep River, Durham, East Haddam, Haddam, Killingworth, Middlefield, Portland, Westbrook
New Haven	Bethany, Middlebury, Woodbridge
New London	Bozrah, Franklin, Lebanon, Lisbon, Lyme, North Stonington, Old Lyme, Preston, Salem, Sprague, Voluntown
Tolland	Andover, Bolton, Columbia, Hebron, Union, Willington

Methodology

A variety of strategies were used to identify and gather data relevant to the rural populations in Connecticut. These included:

- Retrieving systematic web-based reviews of gray and peer-reviewed literature
- Contacting and requesting recent data, datasets and/or reports from rural health departments, state health departments, foundations, United Ways, and other local funding agencies.
- Identifying and analyzing data on health indicators including risk factors and disease rates for both communicable and non-communicable diseases, utilizing existing databases and reports as well as other data sources from local, state and national databases (subset to Connecticut data and further subset to town/zip code or community cluster level, as available).
- Creating summary tables and/or figures for rural compared to urban and/or state by disease (morbidity and mortality) and risk factors (e.g., tobacco, nutrition, physical activity, behavioral), broken down by age, gender, urban/rural and race/ethnicity (as available).

The types of data searched, examined for their relevance and analyzed include:

- Prevalence (risk factor and disease)
- Morbidity
- Mortality rate
- Utilization of services
- Health care costs
- Significance of health problems to the community
- Existing state, community and/or rural health department priorities

At the time of this assessment the Connecticut Health Care Survey was made publically available. This was a randomized telephone survey conducted in 2012-2013 of over 4,608 households. There were 944 individuals interviewed that met the criterion for rural towns in Connecticut. Relevant questions from this survey have been used throughout the report and compared and contrasted to the non-rural residents where possible.

For purposes of comparison between the different rural areas of Connecticut, clusters were created to represent the Connecticut River Valley (CRV), East (E), Northwest (NW), and Southwest (SW) regions of the state (Figure 2). All of the data identified and utilized are referenced in an electronic log created in excel.

Figure 2 – Towns By Rural Clusters

Cluster	Towns*
Connecticut River Valley (CRV)	Chester, Deep River, Durham, East Haddam (Moodus), Haddam (Higganum), Killingworth, Middlefield (Rockfall), Lyme, Old Lyme, Portland, Westbrook
East	Andover, Ashford, Bolton, Bozrah, Brooklyn, Canterbury, Chaplin, Columbia, Eastford, Franklin, Hampton, Hebron, Lebanon, Lisbon, Marlborough, North Stonington, Pomfret (Abington, Pomfret Center), Preston, Putnam, Salem, Scotland, Sprague (Baltic), Sterling (Oneco), Thompson (North Grosvenordale, Quinebaug), Union, Voluntown, Willington, Woodstock (Woodstock Valley, South Woodstock)
Northwest	Barkhamsted (Riverton, Pleasant Valley), Bethlehem, Bridgewater, Burlington, Canaan, Colebrook, Cornwall, East Granby, Goshen, Hartland, Harwinton, Kent, Litchfield (Bantam, Northfield), Morris, New Hartford, Norfolk, North Canaan, Roxbury, Salisbury (Taconic, Lakeville, Weattogue), Sharon, Sherman, Warren, Washington Depot (West Green, New Preston), Woodbury
Southwest	Bethany , Easton, Middlebury, Redding (Georgetown, Redding Center, Redding Ridge, West Redding), Woodbridge

*Names within brackets include Villages that are census-designated places (CDP) within a given town

Demographics of Rural Connecticut

Age and Gender

Connecticut has a population of 3,583,561 residents of whom 326,132 (9.1%) live in rural communities (Figure 3). The age distribution across all rural Connecticut (East, Connecticut River Valley, Southwest, Northwest) is significantly different than the state with individual variation occurring within the rural clusters. For example, the Southwest rural cluster has more persons less than 20 years of age and the East region has fewer persons aged 65 and over. However in general, rural Connecticut has more persons aged 65 years and older. The differences observed in age may lead to different types of targeted intervention programs.

There were no significant differences observed by gender across the regions in rural Connecticut or when compared to the state.

Figure 3 - Age Distribution

Age	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
Less than 20 years	910,092 (25.4)	32,995 (24.8)	16,855 (23.7)	10,516 (27.1)	21,705 (23.8)	80,164 (24.6)	<0.001
20 – 64 years	2,153,185 (60.1)	81,452 (61.3)	42,058 (59.3)	21,592 (55.6)	53,477 (58.5)	193,950 (59.5)	<0.001
65 years and older	520,284 (14.5)	18,386 (13.8)	12,063 (17.0)	6,735 (17.3)	16,191 (17.7)	52,018 (15.9)	<0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

Income/Poverty/Assistance

The rural regions in Connecticut have significantly more families making $100,000 and above and fewer families living in poverty when compared to the state (Figure 4). The East region has the lowest levels of household income (<$50,000) and the Southwest region has the highest household income levels (>100,000). Similarly those living in the East region of the state are more likely to receive supplemental public assistance compared to other rural regions (Figure 5), but at a lower rate than statewide. For example, 10.7% of the population of the state are on Food Stamps/SNAP benefits, compared to a rate of 4.4% overall for rural regions.

Figure 4 - Total Household Income

Total Household Income[2]	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
Less than $10,000	76,257 (5.6)	1,491 (3.0)	490 (1.7)	320 (2.3)	1,119 (3.1)	3,355 (2.7)	<0.001
$10,000 - $49,999	422,626 (31.2)	13,567 (27.1)	6,770 (24.1)	2,488 (17.9)	9,287 (25.5)	31,583 (25.2)	<0.001
$50,000 - $99,999	401,849 (29.6)	16,736 (33.4)	8,295 (29.5)	3,016 (21.7)	11,299 (31.0)	38,298 (30.5)	<0.001
$100,000 - $199,999	332,323 (24.5)	15,259 (30.5)	9,335 (33.2)	4,479 (32.2)	11,162 (30.7)	39,299 (31.3)	<0.001
$200,000 or more	122,794 (9.1)	2,982 (6.0)	3,186 (11.3)	3,611 (26.0)	3,545 (9.7)	13,043 (10.4)	<0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

Figure 5 - Public Assistance Programs

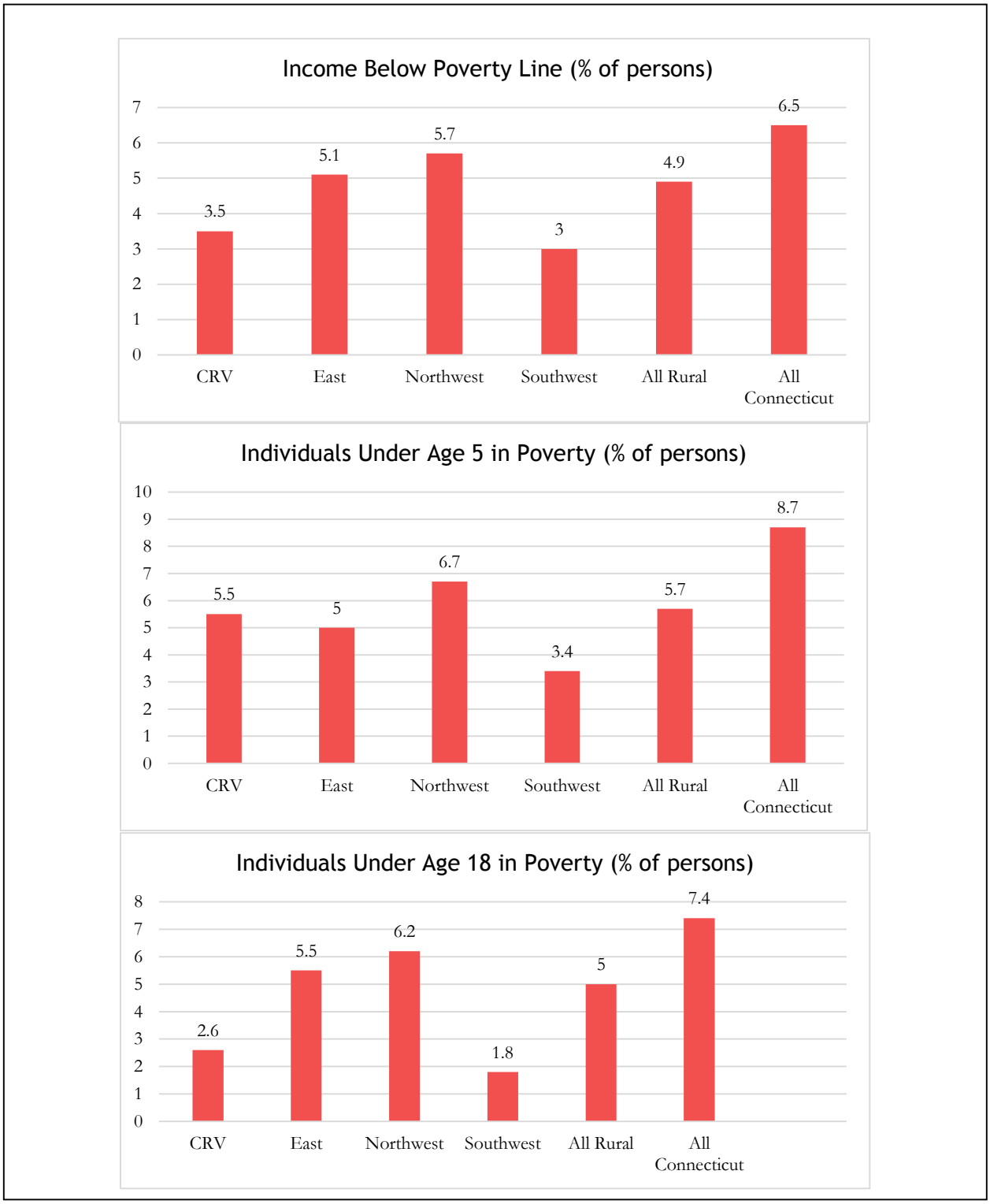
Public Assistance Program[3]	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
Households with Supplemental Security Income	52,032 (3.8)	1,583 (3.2)	389 (1.4)	280 (2.0)	616 (1.7)	2,820 (2.2)	<0.001
Households with Cash Public Assistance Income	42,268 (3.1)	994 (2.0)	403 (1.4)	99 (0.7)	421 (1.2)	1,867 (1.5)	<0.001
Households with Food Stamp/SNAP benefits	144,826 (10.7)	3,369 (6.7)	871 (3.1)	253 (1.8)	1,112 (3.1)	5,532 (4.4)	<0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

[2] Percentage calculated using total number of households as the denominator.
[3] Percentage calculated using total number of households as the denominator.

Figure 6 illustrates those living below the federal poverty line during the past 12 months; compared to other rural regions, the East and Northwest regions have more families including children living in poverty than other rural areas although all remain lower than the state.

Figure 6 - Federal Poverty Line (Past 12 months)



Source: 2010 Census Data (www.census.gov)

Figure 7 shows the number of students eligible for free or reduced price school lunch throughout the public school districts in each of the rural regions. Compared to the other rural regions, the eastern region of Connecticut has the most students eligible for free or reduced price lunch in public school systems. [4]

Figure 7 - Free or Reduced Price School Lunch

Rural Cluster	Students Eligible
CT River Valley	1,002
East	3,292
Southwest	354
Northwest	991
State	185,606

Source: Connecticut State Department of Education (School Year 2010-2011)

Employment

Significantly more persons are employed in rural regions of the state when compared to the state overall (89.8% vs 92.1%)(Figure 8). The population commuting to work and the time that it takes to commute to work is higher in the rural regions. Data on number of vehicles per household is available at the county level for 2013 Census data. Of the counties with large rural regions there were many households without vehicles potentially limiting their transportation to and from medical care. There are 3,969 households in Litchfield County without cars, 2,402 households in Tolland County, and 3,759 in Windham County.

Figure 8 - Labor Force Involvement

Population in Labor Force[5]	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
Employed civilian population	1,759,412 (89.8)	69,038 (90.7)	37,471 (93.3)	19,110 (91.8)	48,006 (93.5)	169,434 (92.1)	<0.001
Unemployed civilian population	190,709 (9.7)	6,871 (9.0)	2,587 (6.4)	1,715 (8.2)	3,330 (6.5)	14,180 (7.7)	<0.001
Armed Forces Population	8,602 (0.4)	236 (0.3)	89 (0.2)	0 (0.0)	24 (<0.1%)	346 (0.2)	0.177
Population commuting to work	1,727,286 (88.2)	67,678 (88.9)	36,892 (91.9)	18,746 (90.0)	46,773 (91.1)	165,995 (90.2)	<0.001
Mean commute time (min)	26.5 ± 0.3	28.0 ± 0.5	27.0 ± 0.9	31.0 ± 2.1	28.2 ± 1.2	28.0 ± 0.5	<0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

[4] Although Figure 6 shows the Northwest as having a slightly higher % than the Eastern region with children less than 18 living in poverty their standard deviations overlap (not shown in the figure; 6.2% ± 1.4 and 5.5% ± 1.1 respectively). Figure 7 then shows the Eastern region as having more children eligible for free and reduced lunches with less in the Northwest. These are data coming from 2 different sources (census and education) and at different time points which may lead to some confusion.

[5] Percentage calculated using population in the labor force as the denominator.

Education

Figure 9 presents educational attainment levels. Significantly more residents age 25 and above living in rural settings in the state were likely to complete a bachelor's degree or higher when compared to the state rates. Those living in the Southwest cluster and in the Connecticut River Valley cluster were the most highly educated.

Figure 9- Educational Attainment

Education (Population age 25 and over)[6]	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
Less than 9th grade completed	109,133 (4.5)	2,013 (2.2)	648 (1.3)	335 (1.2)	1,001 (1.5)	3,913 (1.7)	<0.001
Some high school completed	155,272 (6.4)	5,145 (5.5)	1,616 (3.2)	559 (2.1)	2,747 (4.2)	9,718 (4.2)	<0.001
High school diploma	678,370 (27.8)	29,243 (31.5)	13,327 (26.2)	4,077 (15.2)	15,814 (23.9)	60,770 (26.3)	<0.001
Some college but less than bachelor's degree	610,066 (25.0)	26,486 (28.5)	13,492 (26.5)	5,513 (20.5)	17,586 (26.6)	61,505 (26.6)	<0.001
Bachelor's degree completed	498,124 (20.4)	16,505 (17.8)	11,789 (23.1)	7,988 (29.8)	16,564 (25.0)	51,666 (22.4)	<0.001
Postgraduate Degree	392,796 (16.1)	13,405 (14.4)	10,091 (19.8)	8,367 (31.2)	12,435 (18.8)	43,535 (18.8)	<0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

Race/Ethnicity, and Language

The rural regions of Connecticut reflect a predominantly white, English speaking population that are native born in the United States (Figures 10 -12). The only exception is the Southwest rural region of the state, where the prevalence of those identified as Asian is similar to the state level, and they are more likely to speak another language at home.

[6] Percentage calculated using population over the age of 25 as the denominator.

Figure 10 - Race/Ethnicity

Race/ Ethnicity	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
White	2,792,554 (77.9)	125,351 (94.4)	67,870 (95.6)	35,987 (92.6)	88,104 (96.4)	309,632 (94.9)	<0.001
Black	361,668 (10.1)	1,340 (1.0)	481 (0.7)	387 (1.0)	775 (0.8)	2,966 (0.9)	0.002
Asian	143,013 (4.0)	1,778 (1.3)	1,072 (1.5)	1,778 (4.6)	1,231 (1.3)	5,690 (1.7)	<0.001
Native American	8,770 (0.2)	317 (0.2)	68 (0.1)	54 (0.1)	91 (0.1)	530 (0.2)	<0.001
Other	183,445 (5.1)	452 (0.3)	407 (0.6)	37 (0.1)	292 (0.3)	1,178 (0.4)	0.001
Multiracial	94,111 (2.6)	3,595 (2.7)	1,078 (1.5)	600 (1.5)	880 (1.0)	6,136 (1.9)	<0.001
Hispanic/ Latino	496,939 (13.9)	3,972 (3.0)	1,854 (2.6)	883 (2.3)	2,193 (2.4)	8,884 (2.7)	<0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

Figure 11 - Language

Language (Population over age 5)[7]	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
Speak only English at home	2,658,925 (78.5)	117,982 (93.2)	63,812 (93.9)	32,311 (86.5)	81,218 (93.0)	288,237 (92.5)	<0.001
Speak another language at home	727,241 (21.5)	8,543 (6.8)	4,120 (6.1)	5,059 (13.5)	6,072 (7.0)	23,277 (7.5)	<0.001
Speak English "Less than Very Well"	283,518 (8.4)	2,140 (1.7)	992 (1.5)	1,216 (3.3)	1,508 (1.7)	5,617 (1.8)	<0.001
Speak Spanish at home	371,024 (11.0)	2,468 (2.0)	1,465 (2.2)	722 (1.9)	1,629 (1.9)	6,215 (2.0)	0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

[7] Percentage calculated using population over the age of 5 as the denominator.

Figure 12 - Citizenship

Country of Birth and Citizenship	All Connecticut	East	Connecticut River Valley	Southwest	Northwest	All Rural Connecticut	t-test p-value*
U.S. Native	3,096,374 (86.4)	127,182 (95.7)	67,600 (95.2)	34,594 (89.1)	86,047 (94.2)	307,889 (94.4)	<0.001
Foreign-Born	487,187 (13.6)	5,651 (4.3)	3,376 (4.8)	4,249 (10.9)	5,326 (5.8)	18,243 (5.6)	<0.001
Total Population	3,583,561	132,833	70,976	38,843	91,373	326,132	<0.001
Total Number of Households	1,355,849	50,035	28,076	13,914	36,412	125,578	<0.001

Source: 2010 Census Data: www.census.gov *Note: t-tests were used to compare Connecticut's rural population to its non-rural population; counts do not include the 2300 institutionalized.

Health Care Delivery in Rural Connecticut

Provider Workforce

Health Professional Shortage Areas (HPSAs) are designated by the federal Health Resources and Services Administration (HRSA) as having shortages of primary medical care, dental and/or mental health providers. Medically Underserved Areas/Populations are areas or populations designated by HRSA as having too few primary care providers, high infant mortality, high poverty or a high elderly population. The numbers are calculated based on a ratio of physician to population size. The majority of these shortages occur in rural settings. Each year DPH staff review and respond to the annual review letter sent by the Shortage Designation Branch (SDB). As of August 2015, CT had 82 HPSA designations with 41 in primary medical care, 24 in dental care, and 17 in mental/behavioral health. These designations represent a wide range of regions in CT. Over the past five years, CT has obtained seven full county mental/behavioral health HPSA designations and expanded areas covered in Fairfield County. Medically Underserved Areas or Population (MUA/P) designations can also be found in all eight of CT's counties. As of August 2015, CT had 29 designations covering all or part(s) of 31 towns. [8]

The number of primary care providers in rural regions is presented in Figure 13. The categories of physician type included licensed family medicine and internal medicine providers. Compared to the overall number of family medicine providers in the state, the number in rural areas is much lower.

Figure 13 - Physicians in Connecticut

Rural Cluster	Number of Family Medicine	Number of Internal Medicine
CT River Valley	20	30
East	23	25
Southwest	6	124
Northwest	16	51
State	554	3501

Source: Connecticut Department of Public Health (licensed Family Medicine providers)(DPH, 2014)

Home Health

There are approximately 23 home care agencies serving rural communities in the state (Figure 14). Home-based health care practices are not required to report patient care or utilization rates to the state or federal government therefore there is no data available on their patient population. However, Day Kimball Hospital has a division of home-based care that provides updates in their annual report. In 2014 they reported 44,671 patient visits. This is one of ten organizations in Northeast CT, which suggests this region may have more coverage than other regions. A listing of the organizations can be found in the Appendices.

Figure 14 - Home Health Care Providers

Rural Cluster	Home Health Care Providers
East	6
CT River Valley	5
Southwest	2
Northwest	10
Total	23

[8] Connecticut Department of Public Health – Primary Care Office

Federally Qualified Health Centers

Federally Qualified Health Centers (FQHCs) are an integral part of the health care delivery system in the state. They are designated by the federal government under Section 330 of the Public Health Service Act. The centers adhere to regulations pertaining to the scope and quality of health services provided to anyone regardless of ability to pay.[9] Medicare and Medicaid provide funding reimbursement to qualified centers based on program requirements and services they provide. Most FQHCs are also contracted with commercial insurers. Individuals without insurance pay for services on a sliding fee scale, based on income. The FQHCs provide comprehensive services including primary, preventive, dental and behavioral health, case management and "enabling services," such as translation and transportation.

The Community Health Center Association of CT Inc., (CHCACT) is a not-for-profit organization. It exists to serve its community health center members with assistance to strengthen and support clinical and administrative operations.[10] There are 16 community health centers in Connecticut and 15 are members of CHCACT. Primary, dental, behavioral health and case management are among the comprehensive services provided at the health centers.

Three FQHCs serve the majority of rural residents in the state. Generations Family Health Center, with sites in Putnam, Danielson, Willimantic and Norwich, has been serving eastern CT since 1984. Community Health and Wellness Center of Greater Torrington serves western CT with sites in Torrington and Winsted. United Community and Family Services (UCFS), has many sites serving the rural communities in northern New London County. At the time this report was being compiled UCFS was identified as a Look-Alike health center by the Health Resources and Services Administration. According to the Centers for Medicare and Medicaid Services a Look-Alike health center meets all of the same requirements as other health centers, but UCFS does not receive federal government grant funding. On August 11, 2015, HHS awarded UCFS designation and funding as a full FQHC. Along with this designation, the federal funding will provide for expansion of services, outreach and enrollment initiatives and assist with reducing other costs.

Community Health Center Inc. (CHC, Inc.) is an FQHC with many locations scattered throughout the state. They are not a member of CHCACT. CHC, Inc. provides services at a variety of levels to some rural towns in the Connecticut River Valley region. Their services include medical, dental and behavioral health.

More specific information on the population served, services and health status are found under the utilization section, page 27.

Hospitals

Connecticut has a health care system with a diverse array of services. The hospitals range from small community hospitals in rural regions to large urban hospitals offering a broad scale of specialty care.[11] The landscape of Connecticut's health care system continues to transform under the Patient Protection and Affordable Care Act (PPACA). The Department of Public Health (DPH) Office of Health Care Access (OHCA) has seen an increase in hospitals applying for

[9] http://www.chcact.org/about/what-is-an-fqhc
[10] http://www.chcact.org/about
[11] Connecticut Department of Public Health. 2014. Statewide Health Care Facilities and Services Plan-2014 Supplement. Hartford, CT (p. 22)

regulatory approval to become members of larger umbrella corporate health care systems.[12] Other hospitals strive to remain financially viable and independent of large health care systems.

The Connecticut Office of Rural Health primarily classifies four acute care hospitals in the state as rural. They include Day Kimball and Windham hospitals in Windham County and Charlotte Hungerford and Sharon hospitals in Litchfield County (Figure 15). In addition the office recognizes other hospitals as serving a number of rural communities. These hospitals include William W. Backus, Middlesex and New Milford. Non-affiliated hospitals that include only one hospital are: Charlotte Hungerford, Day Kimball and Middlesex. William W. Backus and Windham hospitals are affiliated with Hartford Health Care Corporation. As of October 1, 2014, New Milford and Danbury Hospital began operating under a single license with Western Connecticut Health Network, Inc. as their parent corporation.[13] Sharon hospital is currently the only for-profit hospital in Connecticut. Their parent corporation, Essent Healthcare, Inc. includes multiple hospitals across the United States under a larger parent corporation, Regional Care Hospital Partners, Inc.[14]

Data on hospital utilization will be provided throughout the remaining parts of the report under relevant sections. It is of note that two of the four rural hospitals (Sharon and Charlotte Hungerford Hospitals) have the 2nd and 3rd highest percentages for uninsured hospital discharges when compared across the 29 hospitals statewide (3.23% and 3.06% respectively; compared to 1.59% statewide).[15]

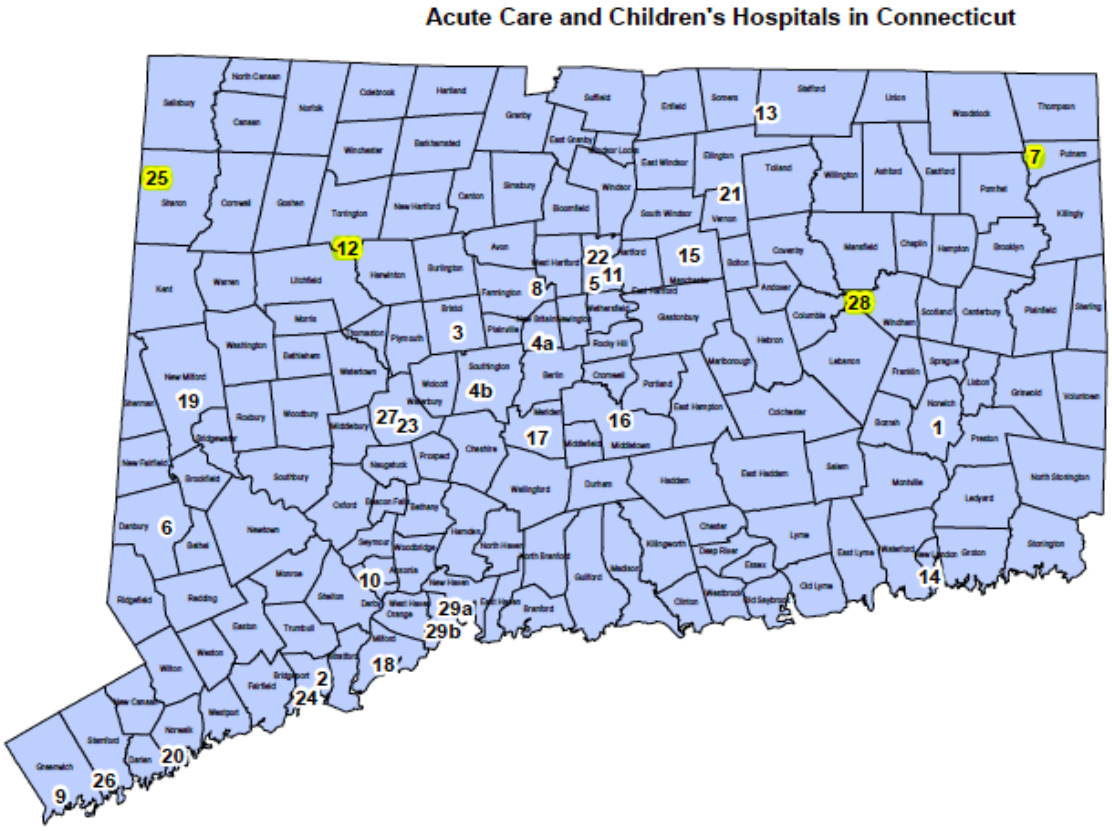
Pre-Hospital Emergency Care

Connecticut depends upon both commercial, hospital based and volunteer/hybrid ambulance services to deliver pre-hospital emergency care and transport. Coordination of the state's emergency medical services (EMS) is done by the CT Department of Public Health's Office of Emergency Medical Services (OEMS).[16] The state is divided into five EMS regions, each overseen by a regional EMS coordinator who reports to the Director of OEMS. The regional coordinators provide a link between local EMS organizations and regional/state councils, committees, boards, and the State Office of EMS. They work in a collaborative manner to assure regional system improvements, technical assistance, and guidance with need for service applications, local and regional EMS plans, local and regional Mass Casualty Incident (MCI) plans, scheduling refresher exam proctors, and support to the Regional Councils.

There are 62 EMS organizations located in or serving rural communities in CT. Most are a hybrid volunteer service where volunteer coverage is augmented by paid staffing or there is compensation offered to volunteers by the community such as tax abatement programs. Recruitment and retention of EMS professionals to provide emergency response coverage continues to be a challenge for rural communities.

[12] Connecticut Department of Public Health. 2014. Statewide Health Care Facilities and Services Plan-2014 Supplement. Hartford, CT (p. 21)
[13] Ibid (p. 13)
[14] Ibid (p. 12)
[15] Department of Public Health, Office of Health Care Access Hospital Reporting System (FY2011-2013)
[16] http://www.ct.gov/dph/cwp

Figure 15 - Map of Connecticut Hospitals



Local Health Departments

Connecticut has 73 local health departments/districts to serve the state's entire population, 51 of which employ a full-time director of health and 22 of which employ a part-time director of health. There are 26 health departments/districts serving rural populations of the state, 21 of whom serve two or more towns (Figure 16).

Local health departments are responsible for preventing disease outbreaks, promoting health programs and policies that support good health and protecting the public from health threats. They monitor water quality, food preparation and develop and provide oversight for emergency preparedness plans.

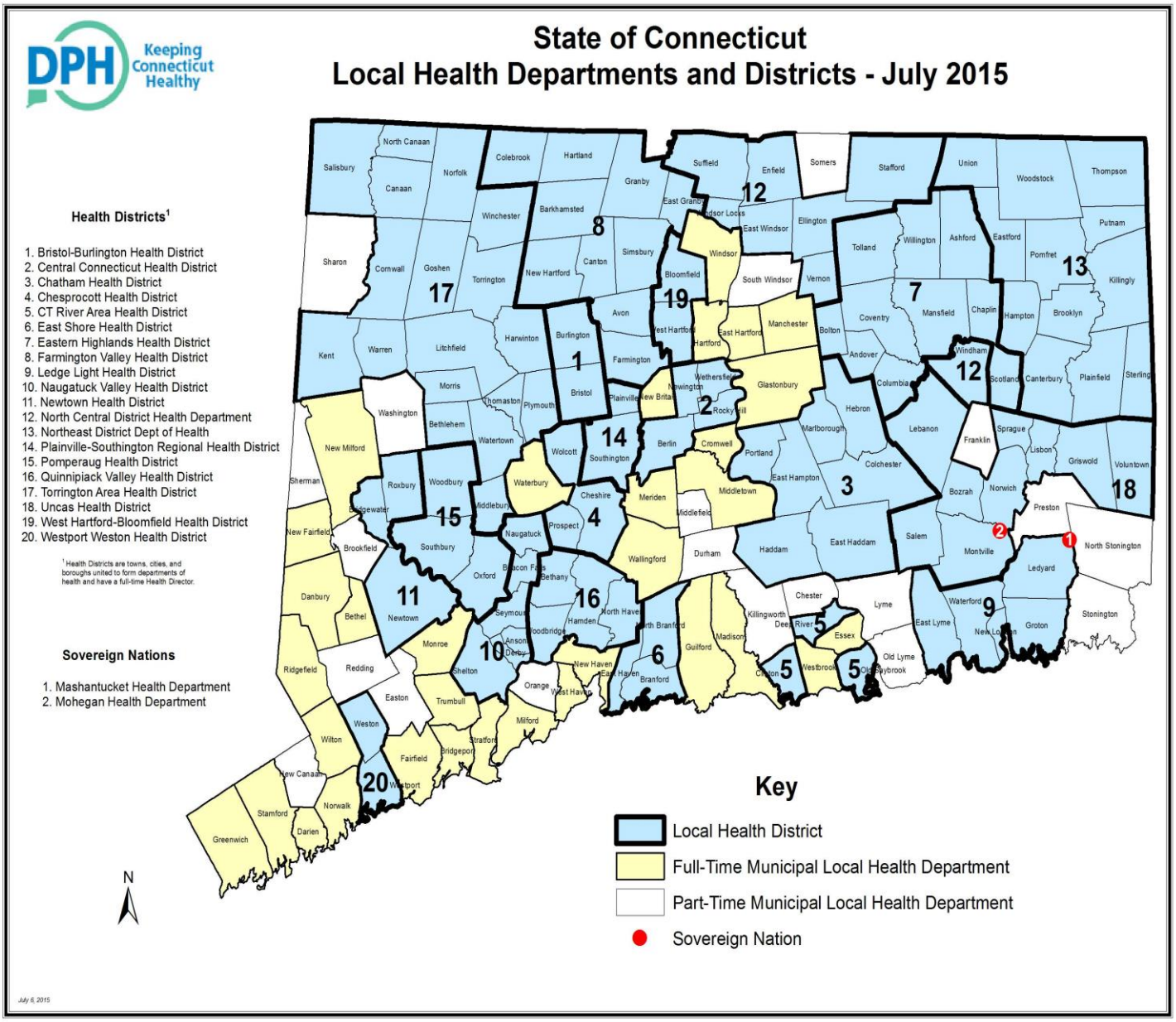
The ten essential services required of local health departments are:[17]

1. Monitor health status to identify and solve community health problems.
2. Diagnose and investigate health problems and health hazards in the community.
3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships and action to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and ensure safety.
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
8. Assure competent public and personal health care workforce.
9. Evaluate effectiveness, accessibility, and quality of personal and population based health services.
10. Research for new insights and innovative solutions to health problems.

Each of these services involve a committed, trained, educated workforce, ample resources including community support and adequate funding.

[17] http://www.cdc.gov/nphpsp/essentialservices.html

Figure 16 - Local Health Departments and Districts



Source: Connecticut Department of Public Health, 2015

Veteran's Health

Rural Veterans

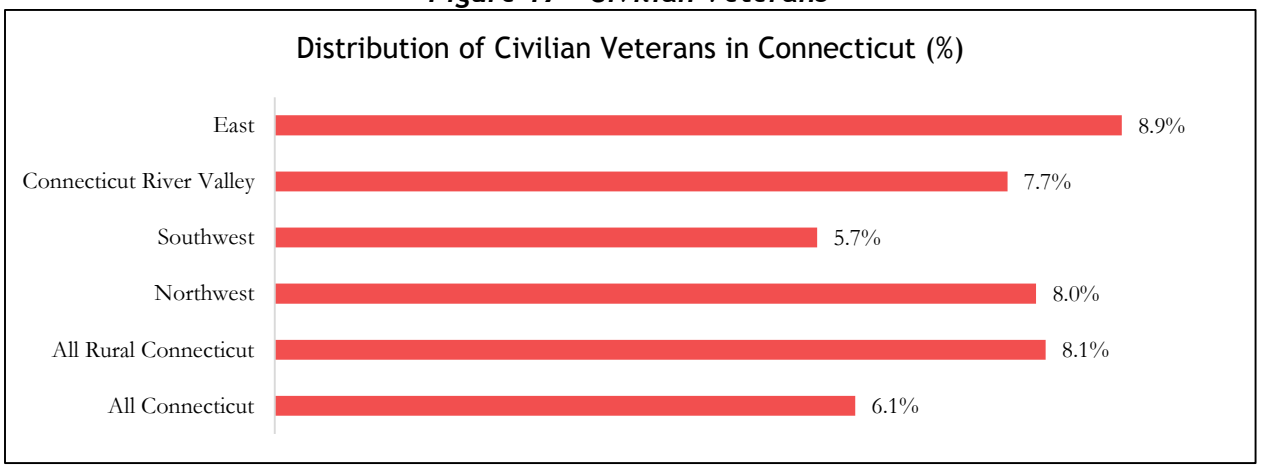
There are approximately 237,000 veterans living in the state of Connecticut (U.S. Department of Veteran Affairs, September 2010). The Connecticut healthcare system for Veterans consists of one hospital in West Haven and an ambulatory care center in Newington. In addition, there are six community based outpatient clinics (CBOCs) statewide in Danbury, New London, Stamford, Waterbury, Willimantic, and Winsted. There are also four Veteran Centers in Danbury, Norwich, Orange, and Rocky Hill. Veteran Centers provide counseling, outreach and referral services to combat veterans and their families. The CBOCs in Winsted and Willimantic serve the rural veterans of Litchfield and Windham counties respectively.

Veterans Affairs Connecticut (VA CT) has a long standing academic affiliation with Yale University School of Medicine and the University of Connecticut Schools of Medicine and Dentistry. More than 1,500 residents, students and fellows from various disciplines receive some portion of their medical training at VA Connecticut each year.[18]

More than 52,000 veterans receive services through the VA CT Healthcare system. Information regarding the health care status of Connecticut veterans is sparse, consistent with the rest of the country. This issue has recently been under scrutiny at the national level, leading to a national survey on the health care of veterans that was commissioned in March of 2015. The survey results will be available by the end of 2015. Major mental health concerns as reported in research studies of veterans include Post-Traumatic Stress Disorder, Depression, and Substance Use/Abuse disorders.[19] These behavioral health conditions are often comorbid with a myriad of physical health conditions.[20]

Figure 17 presents census data on Civilian Veterans residing in rural settings in Connecticut. All rural regions except the Southwest have a higher percentage of veterans when compared to the state.

Figure 17 - Civilian Veterans



Source: 2010 Census Data: www.census.gov

[18] http://www.connecticut.va.gov/about/
[19] Seal, KH, Shi, Y., Cohen, G., Cohen B.E., Maguen, S., Krebs, E.E., Neylan, T.C. Association of Mental Health Disorders with Prescription Opioids and High-Risk Opioid Use in US Veterans of Iraq and Afghanistan. JAMA, 2012; 307(9): 940-947.
[20] Eisen, S.V., Schultz, M.R., Vogt, D., Glickman, M.E., Elwy, A.R., Drainoni, M.L., Osei-Bonsu, P.E., Martin, J., Mental and Physical Health Status and Alcohol and Drug Use Following Return from Deployment to Iraq or Afghanistan, AJPH, March 2012, V102, pp. S66-S73

Homeless Veterans

According to the Connecticut Point in Time Count (*CT PIT 2012)*, 10% of single homeless adults had served in the military. A total of 330 homeless veterans were identified in Connecticut in 2012. As of February 2015, due to the efforts of the Connecticut Coalition to End Homelessness and the homeless provider system in the state, there were only 80 veterans counted in emergency shelters during the CT PIT 2015.[21] The Department of Housing and Urban Development and VA Supported Housing (HUD-VASH) Program provides permanent housing and ongoing case management treatment services for homeless Veterans who require these supports to live independently. By the end of this year the goal is to end homeless among veterans.

[21] Connecticut Coalition to End Homelessness - http://www.errerac cc.com/health-care-for-homeless-veterans; http://www.cceh.org/news-media/recent-news/2015-count-finds-homelessness-down-10-percent-across-connecticut

Utilization and Access in Rural Connecticut

Health Insurance

According to the Census Data in 2010, 89% of the population in CT had health insurance coverage and 3.4% of children under age 18 were without insurance.[22]

In 2010, Connecticut was the first state to adopt Medicaid expansion by launching the Husky D program by transitioning very low income adults from the State Administered General Assistance (SAGA) medical program into Medicaid. In July 2012, data from Thompson Reuters estimated that 344,000 CT residents were uninsured and highly concentrated in mostly urban zip codes. There were 49,000 CT children under age 18 (6%) who lacked insurance for the entire year of 2010. At this time the Thompson Reuters report also estimated that about 84,000 uninsured CT residents were then eligible for Medicaid.[23] Virtually all children in CT are eligible for HUSKY, which keeps the number of uninsured children low.

Access Health CT is Connecticut's state-based insurance marketplace which has offered private Qualified Health Plans (QHP) through an open enrollment program that began in Fall 2013. During assisted enrollment sessions, the most appropriate and affordable plan is identified which may be a QHP or Medicaid/HUSKY. Connecticut further expanded coverage for childless adults in 2014 by raising the income eligibility limit to 138 percent of the federal poverty level. CT has uniquely required that each QHP must include 90% of CT FQHCs in their network.[24]

Figure 18 - HUSKY Enrollments as of August 2015

	December 2008	August 2015	Change
Husky A (adults and children)	329,267	462,306	133,039
Husky B	14,518	15,628	1,110
Husky C (aged, blind, disabled	*	94,853	
Husky D (low-income adults)	**	197,585	
Limited benefit	*	1,092	
Total Husky Enrollment	428,700	771,465	342,765

Source – Access Health CT enrollment data; *this count was not provided publicly until March 2012; **HUSKY D did not exist in September 2008

Enrollment numbers for Access Health CT can only provide a snap shot of people with health insurance coverage as this is in continuous flux due to changes in eligibility and employment status. For the calendar year 2014, 10,595 rural residents enrolled in QHPs and 24,819 became covered under Medicaid. Figure 18 presents Husky enrollment data from 2008 and the most recent data from August of 2015. Note the substantial 56% increase in Husky enrollment since 2008. With the next census in 2020 a more accurate picture will reflect the impact of the ACA and CT Medicaid expansion and contraction on the number and percentage of state residents that remain uninsured.

[22] www.census.gov
[23] Thompson Reuters, July 2013
[24] Community Health Center Association of Connecticut, *Connecticut's State Environmental Analysis, July 1, 2015*

Oral Health

Figure 19 presents data on dental care among rural vs non-rural residents. While rural residents were more likely to have visited a dentist within the past 12 months compared to all others, 21% of the population have not accessed dental care. Approximately 15% of rural residents who needed dental care did not seek it due to cost (Figure 20).

Figure 19 - Routine Dental Examination

Within the last 12 months, have you visited a dentist for a routine check-up, cleaning, or examination?		
	Rural	All Others Combined
Yes	746 (79.0)	2,549 (72.2)
No	195 (20.7)	939 (26.6)
I Do Not Need Dental Care	41 (4.3)	3 (0.1)
Total	944	3,529

Source: Connecticut Health Care Survey 2013

Figure 20 - Delayed Dental Care Due to Cost

Was there a time during the last 12 months when you needed dental care but did not receive it because you were worried about the cost?		
	Rural	All Others Combined
Yes	146 (15.5)	656 (18.8)
No	797 (84.5)	2,835 (81.2)
Total	943	3,491

Source: Connecticut Health Care Survey 2013

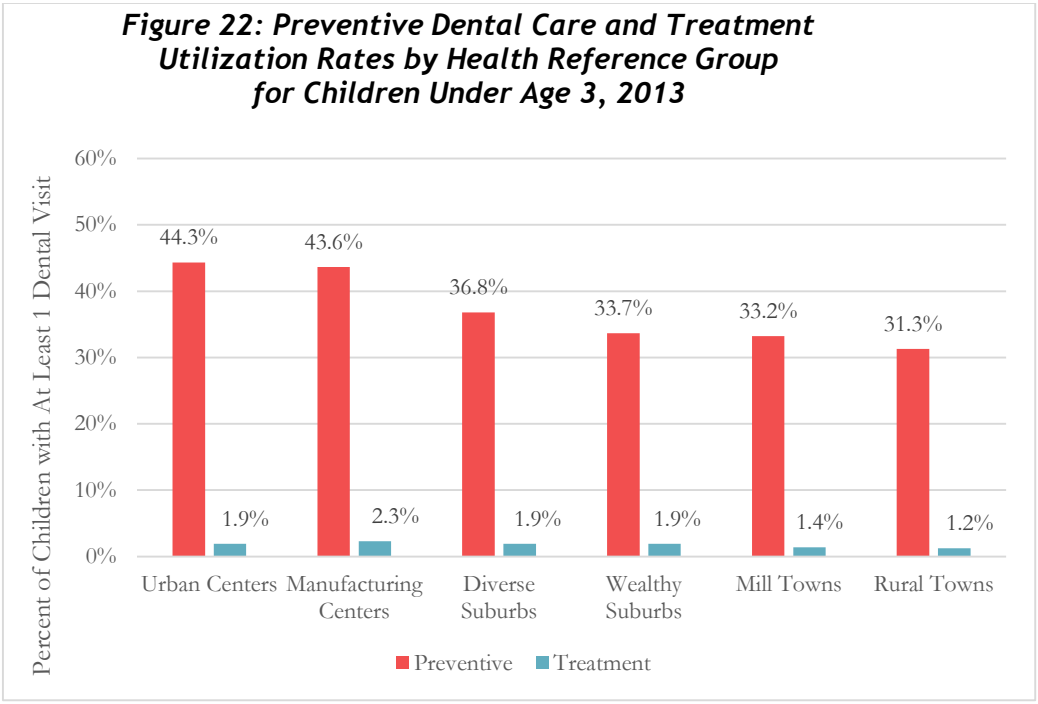
With respect to children, the results of the Connecticut Health Survey indicated that 92.3% were receiving dental care (Figure 21). Using a different set of criteria for rural town designation refer to Appendices XI - Health Reference Groups as defined by the Connecticut Health Foundation. Focusing on children less than 3 years of age, those living in rural towns were less likely to have received preventive dental care (44.3%) (Figure 22).

Figure 21 - Routine Child Dental Examination

Within the last 12 months, has this child visited a dentist for a routine check-up, cleaning, or examination?		
	Rural	All Others Combined
Yes	144 (92.3)	498 (93.1)
No	12 (7.7)	37 (6.9)
Total	156	535

Source: Connecticut Health Care Survey 2013

Figure 22: Preventive Dental Care and Treatment Utilization Rates by Health Reference Group for Children Under Age 3, 2013



Source: Connecticut Voices for Children, analysis of HUSKY A (Medicaid) enrollment and claims data (2013)

Primary and Preventive Care

As described in earlier sections, access to health care within rural settings includes family medicine practices, internal medicine practices, nurse practitioners, community health clinics, hospitals, and local health departments. According to the results of the Health Survey, approximately 90% of the rural population reported visiting a doctor's office or clinic to obtain healthcare, with 30% reporting five or more visits in the past 12 months (Figure 23). These percentages do not include visits to the emergency room. When rural residents were asked if there was any time that they were not able to obtain the care that they needed, almost all reported they were able to obtain care.

Figure 23 - Health Care Utilization

In the last 12 months, not counting the times you went to an emergency room, how many times did you go to a doctor's office or clinic to get health care for yourself?		
	Rural	All Others Combined
None	101 (10.7)	452 (12.9)
1	141 (15.0)	460 (13.2)
2	179 (19.0)	612 (17.5)
3	128 (13.6)	411 (11.8)
4	109 (11.6)	460 (13.2)
5 to 9	164 (17.4)	631 (18.1)
10 or more	118 (12.6)	467 (13.4)
Total	940	3,493

Source: Connecticut Health Care Survey, 2013

Hospitalization and Emergency Department Use

Data regarding emergency room utilization, outpatient visits, and hospitalization for the four rural hospitals are presented in Figure 24. These figures are significant in relation to hospital specific trends year to year. Comparing rural hospitals to each other by number of visits has limited value as they vary in licensed beds, ED/OP capacity and local demographics. Charlotte Hungerford Hospital had the highest utilization of ED visits in 2012 (40,878) and Sharon Hospital had the lowest (17,622). In general, all hospitals show an increasing trend of utilization from FY2008-FY2012 with Windham Community Hospital showing the highest rate of change. With respect to other outpatient visits such as specialty departments, Day Kimball Hospital was the highest in 2012 (287,732) and Sharon the lowest (65,019).

Figure 24 - Emergency Room (ED) and Other Outpatient (OP) Visits

Hospital Name	FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
	ED Visits	Other OP Visits	ED Visits	Other OP Visits	ED Visits	Other OP Visits	ED Visits	Other OP Visits	ED Visits	Other OP Visits
Charlotte Hungerford	38,829	168,130	38,940	170,965	38,593	174,793	39,535	196,823	40,878	213,877
Day Kimball	28,155	261,168	33,774	267,567	32,254	272,854	28,805	287,732	28,011	284,755
Sharon	16,363	60,096	16,013	65,728	15,265	65,006	17,658	65,019	17,622	69,975
Windham	28,668	31,269	30,014	32,530	32,362	124,134	34,122	127,163	36,862	123,302
Other Hospitals	1,472,156	5,191,924	1,529,300	5,498,212	1,553,639	5,499,775	1,583,375	5,567,766	1,635,142	5,741,581
TOTAL	**1,584,171**	**5,712,587**	**1,648,041**	**6,035,002**	**1,672,113**	**6,136,562**	**1,703,495**	**6,244,503**	**1,758,515**	**6,433,490**

Source: Connecticut Department of Public Health Office of Health Care Access
*Note: Due to the implementation of the Hospital Reporting System (HRS) and revised data definitions, comparability between FYs 2007-2009 and previous years may show high variability

When quality of care received by rural residents utilizing the four primary rural hospitals was examined against the Connecticut average and National Average including factors related to ED visits, surgery, and/or outpatient care, they performed well (Figure 25). Areas for improvement are noted below and vary by hospital and indicator.

Areas of potential strengths included:

- Day Kimball response times to ECG
- Fracture set times for all hospitals except Sharon
- Charlotte Hungerford providing educational materials to stroke patients

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- Day Kimball response times to ECG
- Fracture set times for all hospitals except Sharon
- Charlotte Hungerford providing educational materials to stroke patients

Figure 25 - Quality of Care in Rural Hospitals

	Charlotte Hungerford Hospital	Day Kimball Hospital	Sharon Hospital	Windham	Connecticut Average	National Average
Average number of minutes before outpatients with chest pain or possible heart attack got an ECG	6 minutes	4 minutes	7 minutes	**9 minutes**	7 minutes	7 minutes
Outpatients with chest pain or possible heart attack who got aspirin within 24 hours of arrival	98%	97%	98%	N/A	98%	97%
Heart attack patients given aspirin at discharge	**96%**	100%	100%	**93%**	99%	99%
Heart failure patients given discharge instructions	96%	100%	100%	**92%**	94%	95%
Outpatients having surgery who got the right kind of antibiotic	98%	100%	**91%**	97%	97%	98%
Surgery patients who were given the right kind of antibiotic to help prevent infection	**97%**	100%	100%	**94%**	99%	99%
Average time patients who came to the emergency department with broken bones had to wait before receiving pain medication	41 minutes	43 minutes	**56 minutes**	38 minutes	54 minutes	54 minutes
Patients assessed and given influenza vaccination	**91%**	**85%**	99%	93%	93%	93%
Ischemic stroke patients who received medicine known to prevent complications caused by blood clots within 2 days of arriving at the hospital	**94%**	100%	100%	N/A	99%	98%
Ischemic or hemorrhagic stroke patients or caregivers who received written educational materials about stroke care and prevention during the	100%	**89%**	92%	N/A	90%	92%
Outpatients who had a follow-up mammogram, ultrasound, or MRI of the breast within 45 days after a screening mammogram	20.6%	**9.9%**	15.9%	N/A	19.5%	8.8%

Source: Connecticut Department of Public Health, Office of Health Care Access (2013)

Federally Qualified Health Center Utilization

The four FHQCs that serve the majority of rural residents in the state differed from one another in terms of population served in regards to race/ethnicity and language (Figure 26). Only Community Health Center Inc. reported addressing substance abuse, 177 patients in 2013. The rates of hypertension, diabetes, and asthma varied across providers, with diabetes and asthma being particularly high in Generations Family Health Center and hypertension high in both Community Health and Wellness Center of Torrington and Community Health Center, Inc. Similarly, the rates of preventive screening varied across providers with Community Health Center Inc. providing more colorectal and cervical screening services compared to the other two.

Figure 26 – Federally Qualified Health Centers: Population Served, Services & Health Status (2013)

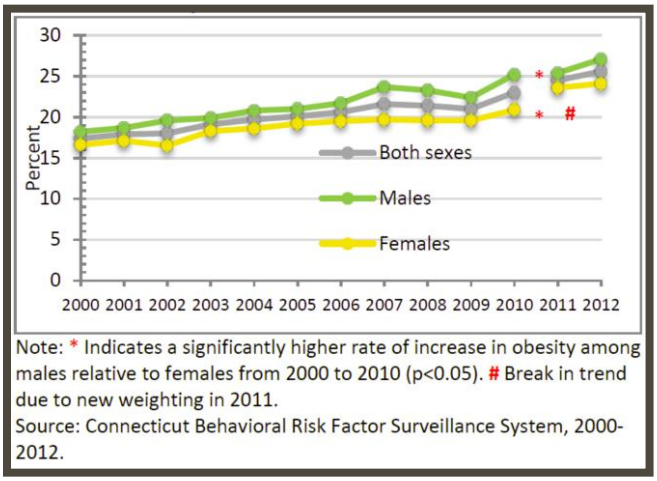
	United Community and Family Services Inc.	Community Health and Wellness Center of Greater Torrington	Generations Family Health Center	Community Health Center Inc.
Total Patients	15,491	6,565	22,514	80,449
White	79.1%	93.1%	87.2%	40.2%
Best served in other language	2.2%	4.0%	7.6%	22.8%
below 200% poverty	91.9%	79.2%	91.4%	92.9%
Uninsured	13.0%	21.0%	18.0%	20.0%
Medicaid/CHIP2	61.4%	50.0%	54.5%	62.0%
Homeless	143	194* (down from 864 in 2012)	1,653 (up from 1419 in 2012)	3,176
Veterans	299	96 (down from 136 in 2012)	91 (up from 64 in 2012)	348
Medical Services	8,533	5,593	18,319	62,218
Dental Services	6,605	2,345	7,096	26,101
Mental Health	4,518	170	1,062	10,149 (up from 8,461 in 2012)
Hypertension	19.5%	25.0%	21.0%	28.7%
Diabetes	10.2%	9.6%	15.6%	9.6%
Asthma	-	7.8%	13,4%	12.6%
Cervical Screening	62.9%	57.1%	71.4%	77.5%
Colorectal Cancer Screening	44.3%	42.9%	32.9%	89.7%

Source: Bureau of Primary Health Care, HRSA, 2013

Health Related Behavior and Health Risks

Weight and Exercise

Figure 27 - Rate of Obesity in Adults



Note: * Indicates a significantly higher rate of increase in obesity among males relative to females from 2000 to 2010 (p<0.05). # Break in trend due to new weighting in 2011.
Source: Connecticut Behavioral Risk Factor Surveillance System, 2000-2012.

In 2014, the percentage of adults in the state of Connecticut that did not engage in physical activity during their leisure time was 25.5%, and only 3.3% walked or biked to work.[25] In a separate study conducted by the Institute for Health Metrics and Evaluation based out of University of Washington, data on the percent of adults meeting recommended physical activity guidelines revealed for the most part, all Connecticut counties with the exception of Windham county had adult females and males meeting similar rates as the rest of the country (52.6% and 56.3% respectively). In Windham county 52.3% of males met the recommended guidelines. The prevalence of obesity in the state among the adult population was reported to be 25% making Connecticut the 9th lowest rate in the nation.[26] As depicted in Figure 27 this rate hasn't changed over the past several years.

Figure 28 presents child weight status based on self-reported body mass index (BMI) taken from the Connecticut Health Care Survey. Of the adults in the rural household that reported on their children's BMI the prevalence of overweight/obese was 32.1% compared to 35.4% in the non-rural group. These rates are higher than the 2011 data from the Connecticut School Health Survey where the combined overweight/obese rate was 26.6%. With respect to physical activity, the results for youth in the BRFSS 2014 survey subset to Connecticut revealed that 14.4% did not engage in physical activity.

Figure 28 - Child Weight Status

Child's weight status category based on self-reported body mass index (BMI)		
	Rural	All Others Combined
Underweight	14 (10.9)	29 (7.2)
Normal	73 (57.0)	230 (57.4)
Overweight	23 (18.0)	79 (19.7)
Obese	18 (14.1)	63 (15.7)
TOTAL	128	401

Source: Connecticut Health Care Survey, 2013

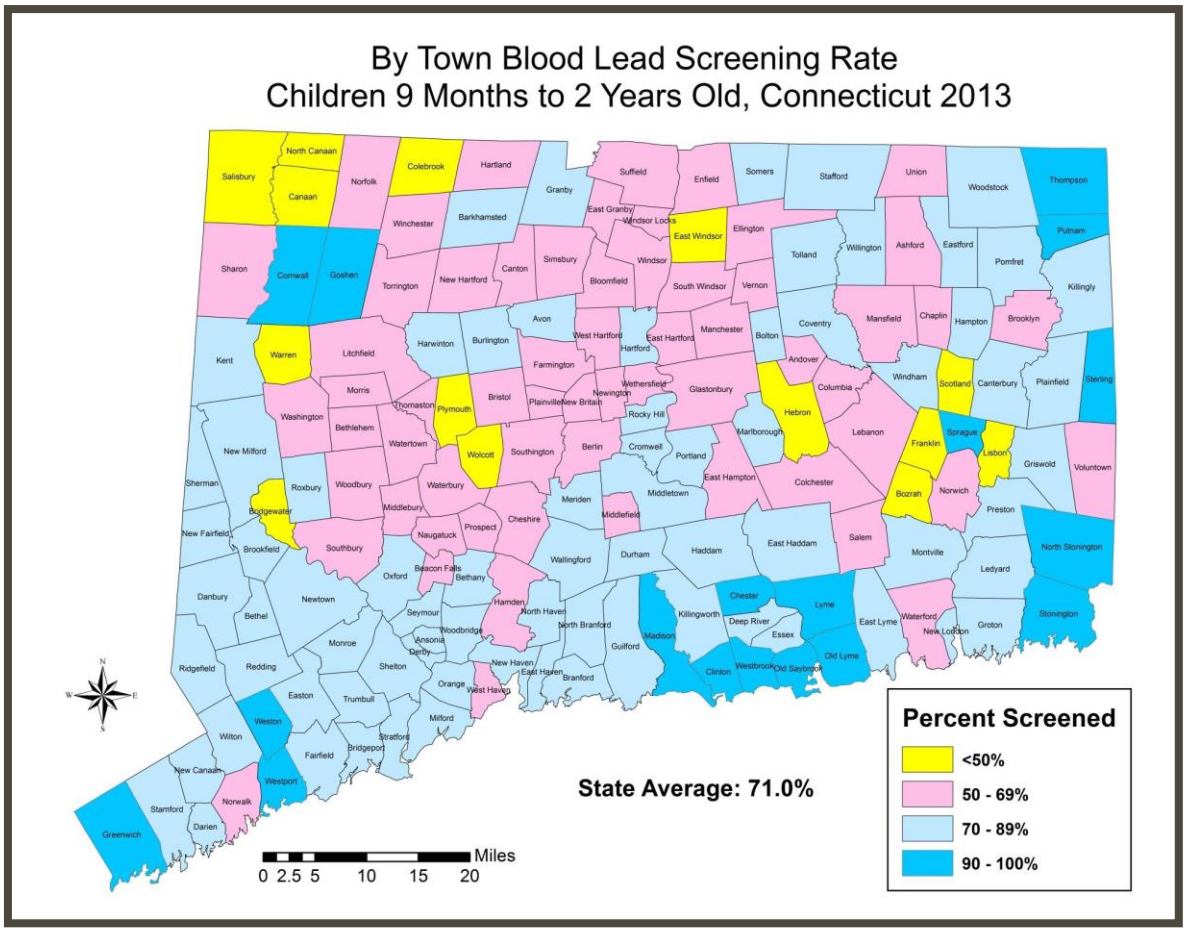
[25] Behavioral Risk Factor Surveillance System (BRFSS): Data not available at the town level on weight or levels of physical activity in the adult or child population in Connecticut, only state overall.
[26] 2013, *http://stateofobesity.org/states/ct/* and National Center for Chronic Disease Prevention & Health Promotion, Centers for Disease Control and Prevention. Obesity was defined as having a BMI greater than or equal to 30.

Environmental Risks

Lead Poisoning

Lead poisoning remains a significant risk among urban and rural populations across the state of Connecticut. Lead screening rates for young infants are presented in the map in Figure 29. There are many rural towns with screening rates below the state level of 71%.

Figure 29 - Lead Screening Rates for Young Infants by Town (2013)



Source: Connecticut Department of Public Health:
http://www.ct.gov/dph/lib/dph/environmental_health/lead/pdf/cy_2013_surveillance_report.pdf

Using the same data and adding in information for children under the age of six, Figure 30 presents lead screening rates by rural clusters. The rural towns with low screening participation rates included Franklin, Bridgewater, Colebrook, Warren, Union and Putman.

Figure 30: Lead screening for children under age 6 years and between 9 months to 2 years of age by Rural Cluster

Rural Cluster	Average Number of Children Under Age 6 Screened	Population Age 9 months-2 years	Number of Children Age 9 months-2 years Screened	Percentage of Children Age 9 months-2 years Screened
CT River Valley	95	108	88	88.5
East	71	72	523	69.8
Southwest	90	103	76	73.8
Northwest	38	50	32	60.8
Rural Total*	4404	4928	3591	69.0
State Total	75749	78288	55862	71.4

Source: Connecticut Department of Public Health Annual Disease Surveillance Report, 2013; http://www.ct.gov/dph/lib/dph/environmental_health/lead/pdf/cy_2013_surveillance_report.pdf; rural total = counts for columns 1-3

The threshold for blood lead levels of concern recently changed from ≥10 µg/dL to blood levels of lead ≥5 µg/dL (CDC, 2012).[27] This change now identifies many more children with lead exposure that require medical intervention and follow-up. However, any positive level above zero which is a positive confirmed case, requires further testing. Of children screened for lead in 2013, there were 74,636 confirmed cases across the state, with 3,125 children having readings ≥5 µg/dL (Figure 31). Although overall the rural regions were not as high as other regions in the state, the East region reported the most confirmed lead tests.

Figure 31: Confirmed Lead Tests

Rural Cluster	Number Confirmed
CT River Valley	760
East	2,006
Southwest	446
Northwest	988
Total Rural	4,200
State	74,636

Source: Connecticut Department of Public Health, 2013

[27] http://www.cdc.gov/nceh/lead/acclpp/lead_levels_in_children_fact_sheet.pdf

Tick Borne Illnesses

Ticks found in Connecticut carry a variety of disease causing agents including, rickettsia, bacteria, and protozoa. People can become infected with more than one disease with one tick bite. When multi-infection transmission occurs, diagnosis and treatment can be difficult. Symptoms and treatment for each condition may vary.

Besides Lyme disease, ticks in Connecticut can also transmit the following reportable diseases: Babesiosis, Human granulocytic anaplasmosis/ehrlichiosis (HGA/HGE), Rocky Mountain spotted fever (RMSF). There are two primary tick species in Connecticut that transmit these diseases: Ixodes scapularis (deer tick); transmits Babesiosis, HGA/HGE, and Lyme disease Dermacentor variabilis (dog tick); transmits RMSF.[28]

Lyme Disease

Lyme disease is an important health concern in Connecticut. Since it was first recognized in the Lyme, Connecticut area in 1975, the Department of Public Health (DPH) has contributed to the understanding of this complex disease, as well as other tick-borne diseases. On average since 1998, the DPH has reported about 3,000 cases annually to the Centers for Disease Control and Prevention (CDC). Recently, the CDC estimated that there are approximately 10 times more people diagnosed with Lyme disease than the yearly reported number. Using the CDC estimate, approximately 30,000 people are diagnosed with Lyme disease each year in Connecticut. [29]

Comparisons between data from 2010 and 2013 (Figures 32 and 33) reveal that there has been an increase in the prevalence of Lyme Disease, particularly in the rural regions of the state.

Figure 32: Lyme Disease Rate 2010

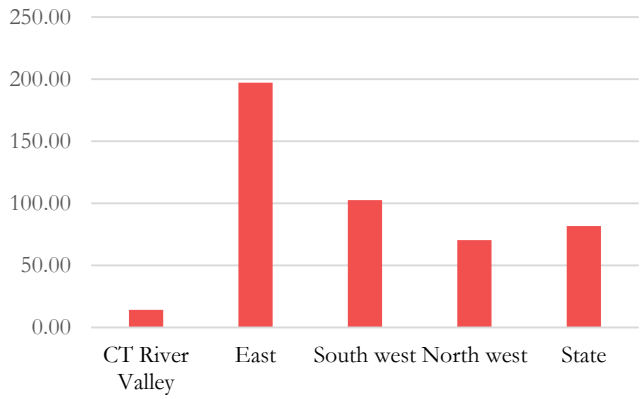
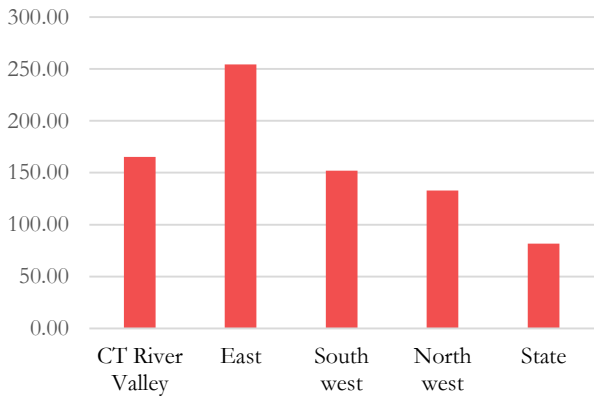


Figure 33: Lyme Disease Rate 2013



Source: Connecticut Department of Public Health, 2013

In 2013 there were a total of 2918 confirmed and probable cases in the state with the highest prevalence of Lyme disease in the eastern region with 278 new cases and a prevalence of 254.25 per 100,000 (Figure 34). The towns in the east with the highest number of cases included Chaplin (18), Columbia (21) and Lebanon (25). Town level data can be found in Appendices XII.

[28] http://www.ct.gov/DPH/cwp/view.asp. Content Last Modified on 8/12/2013
[29] http://www.ct.gov/DPH

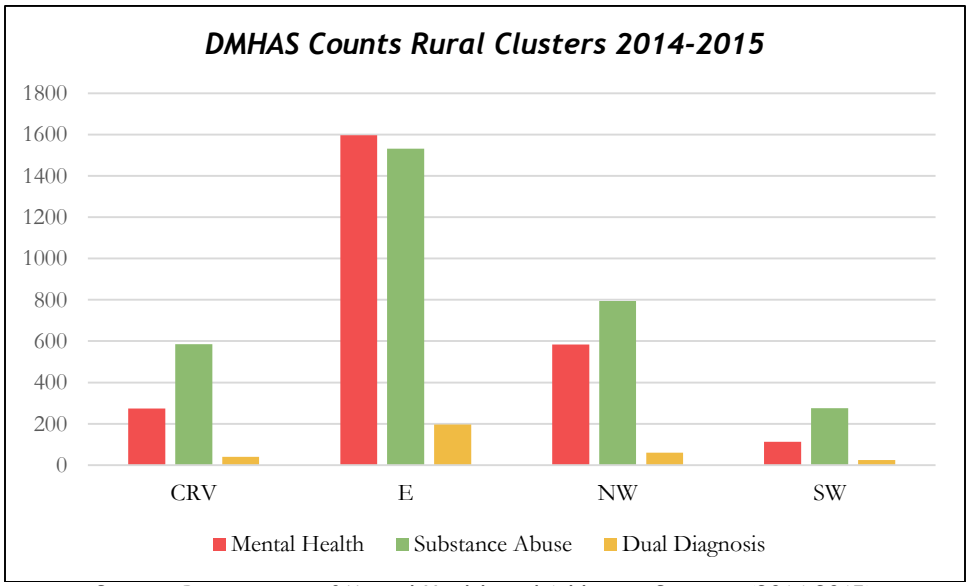
Figure 34 - Lyme Disease Rate by Rural Cluster

Rural Cluster	Lyme Disease Rate Per 100,000	Cases
CT River Valley	165.19	122
East	254.25	278
Southwest	152.06	58
Northwest	132.85	124
State	81.60	2918

Source: Connecticut Department of Public Health (2013)

Behavioral Health – Mental Health, Substance Use/Abuse

Connecticut residents have access to a variety of advocacy and support services which can be found on the CT Department of Mental Health and Addiction Services (DMHAS) website. DMHAS annual statistical report includes data on clients served, demographic characteristics, types of services provided, residential and inpatient utilization and substance abuse use trends.[30] Figure 35 presents the numbers of clients served in DMHAS funded or DMHAS operated programs at the rural cluster level. During 2014-2015 there were 6,075 clients served (5.4%) that resided in rural settings of the total of 111,575 clients served across the state. There were more clients receiving services for substance abuse (N=3,188) compared to mental health (N=2,566) and a small number receiving services for dual diagnoses (N=321). The Eastern region of the state had substantially more clients receiving services for substance abuse or mental health when compared to all other rural areas of the state.



Source: Department of Mental Health and Addiction Services (2014-2015)

[30] Department of Mental Health and Addiction Services Annual Statistical Report SYF2013 & SYF2014; http://www.ct.gov/dmhas/lib/dmhas/eqmi/annualreportsfy13-14.pdf

With respect to specific types of substance use/abuse, heroin is the most commonly reported drug among primary drug treatment admissions in Connecticut.[31]

The Institute for Health Metrics and Evaluation (IHME) at the University of Washington analyzed health data across counties[32] in the United States and the results for 2012 are presented in Figure 36. Examining the data at the county level in Connecticut reveals that compared to national rates:

- Females and males in Litchfield, Middlesex, New London and Tolland counties have higher rates of heavy drinking
- Although binge drinking is lower in females overall, female rates of binge drinking are particularly higher in Litchfield, Middlesex and Tolland counties and male binge drinking is higher in Litchfield and Middlesex counties
- Smoking in females is lower in Connecticut counties compared to the nation, whereas smoking in males is higher in all counties with the exception of Tolland county

Figure 36 – Alcohol and Tobacco Use in Connecticut Counties

	Hartford	Litchfield	Middlesex	New London	Tolland	Windham	National
Heavy drinking prevalence - females	6.7	9.5	9.9	8.3	8.9	6.9	6.7
Heavy drinking prevalence - males	8.6	12.1	11.8	10.9	11.2	10.1	9.9
Binge drinking prevalence - females	12.4	14.6	15.1	13.2	15.0	13.0	12.4
Binge drinking prevalence - males	24.4	29.0	27.2	26.2	26.5	24.7	24.5
Smoking prevalence - females	15.5	17.7	15.8	16.9	15.2	19.5	22.2
Smoking prevalence - males	20.4	20.7	19.0	20.8	17.3	22.8	17.9

Source: Institute for Health Metrics and Evaluation, University of Washington, 2012

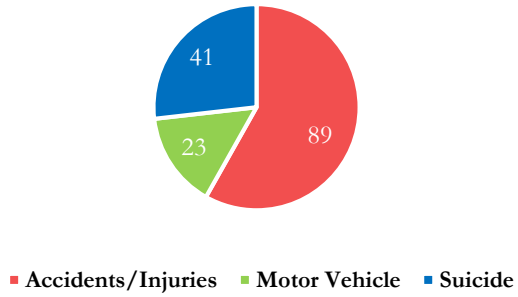
[31] Treatment Episode Data Set, Substance Abuse and Mental Health Services 2012
[32] http://www.healthdata.org/us-county-profiles

Personal Safety

Rural Deaths

In 2014 there were 1,867 premature deaths in Connecticut, of which 153 were from rural towns. (Figure 37). The majority of premature deaths in rural towns were accidental, attributable to fires, falls, choking and poison ingestion. Motor vehicle accidents accounted for 23 and the remaining 42 deaths were categorized as suicide. When compared to previous years, since 2010 there has been a steady increase in the number of accidental drug related deaths statewide from 355 to 558. All other categories have remained steady or decreased. Homicides have decreased from 151 to 101.

Figure 37 - 2014 Rural Town Deaths



Source: Office of Chief Medical Examiner, 2014

Firearm Related Deaths

There were 186 deaths in the state related to firearms in 2014. There were a total of twenty-three deaths due to firearms in rural Connecticut between January 2014 and March 2015. Of these 23 deaths, one was a homicide in Brooklyn, and the remaining 22 were self-inflicted gunshot wounds.

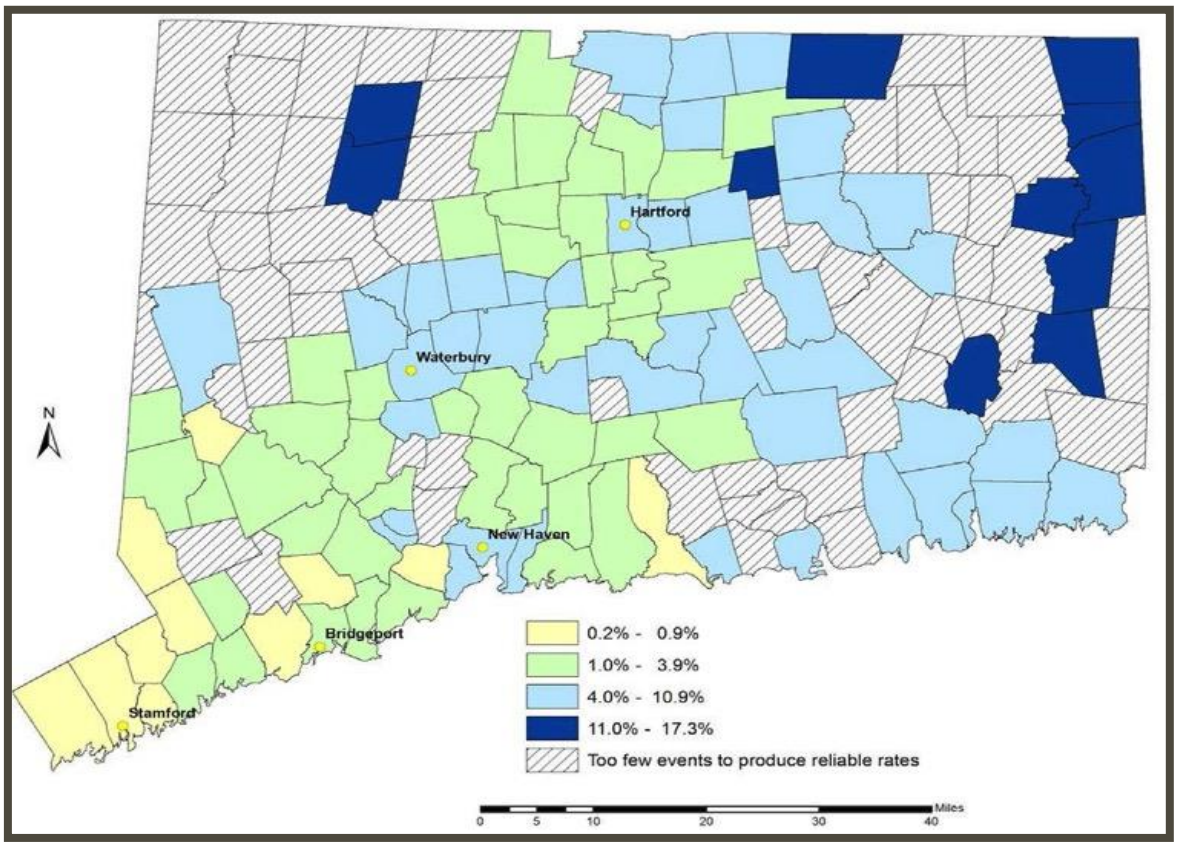
Pregnancy Related Risks

Smoking During Pregnancy

During 2011, in the state of Connecticut, 13.4% of babies born to mothers who smoked during pregnancy were low birth weight, compared to 7.5% of babies born to non-smokers; white, black, and Hispanic women who smoked during pregnancy were more likely than their counterparts who did not smoke to deliver low birth weight babies.[33] Figure 38 presents the percent of women who smoked during pregnancy (2006-2010). The highest rates of smoking among pregnant women occurred in rural settings in the state particularly in the northeastern region.

[33] http://www.ct.gov/dph/lib/dph/hems/tobacco/pdf/pregnancy_and_smoking_2014.pdf

Figure 38 - % of Women Who Smoked Tobacco During Pregnancy



Source: Connecticut Department of Public Health, Health Statistics & Surveillance, Statistics & Analysis Reporting, Birth Certificates, 2006-2010.

Health Status of Rural Connecticut

Overall Physical Health

The Connecticut Health Care Survey results illustrate that the majority of rural residents consider their health to be excellent or very good (66.9%); this is in contrast with non-rural residents who report 56.5% (Figure 39). Children report their health primarily as excellent and very good in rural settings (95%) compared to children in non-rural settings who report lower ratings (86.5%) Figure 40.

Figure 39 - General Health Status

General Health Status		
	Rural	All Others Combined
Excellent	195 (20.7)	688 (19.6)
Very Good	436 (46.2)	1,297 (36.9)
Good	232 (24.6)	988 (28.1)
Fair	71 (7.5)	424 (12.1)
Poor	9 (1.0)	115 (3.3)
Total	943	3,512

Source: Connecticut Health Care Survey 2013

Figure 40 - Child's Health

In general, your child's health is...		
	Rural	All Others Combined
Excellent	112 (63.6)	393 (60.9)
Very Good	55 (31.3)	165 (25.6)
Good	7 (4.0)	72 (11.2)
Fair	2 (1.1)	11 (1.7)
Poor	0	4 (.6)
Total	176	645

Source: Connecticut Health Care Survey 2013

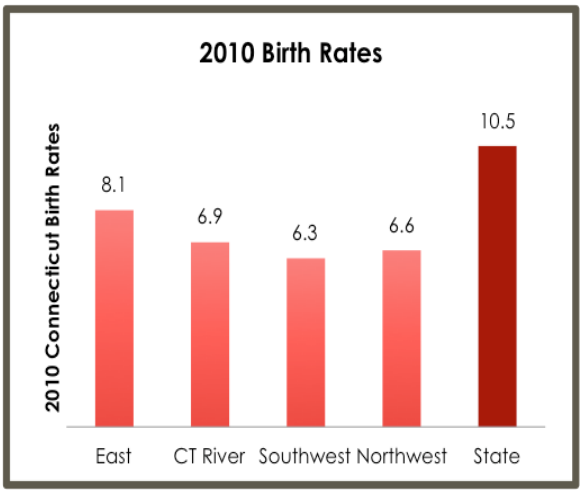
Pregnancy/Birth Outcomes

Birth Rate

The birth rates in rural areas of Connecticut are lower than the overall state rate, and particularly lower in the Southwestern region (Figure 41).

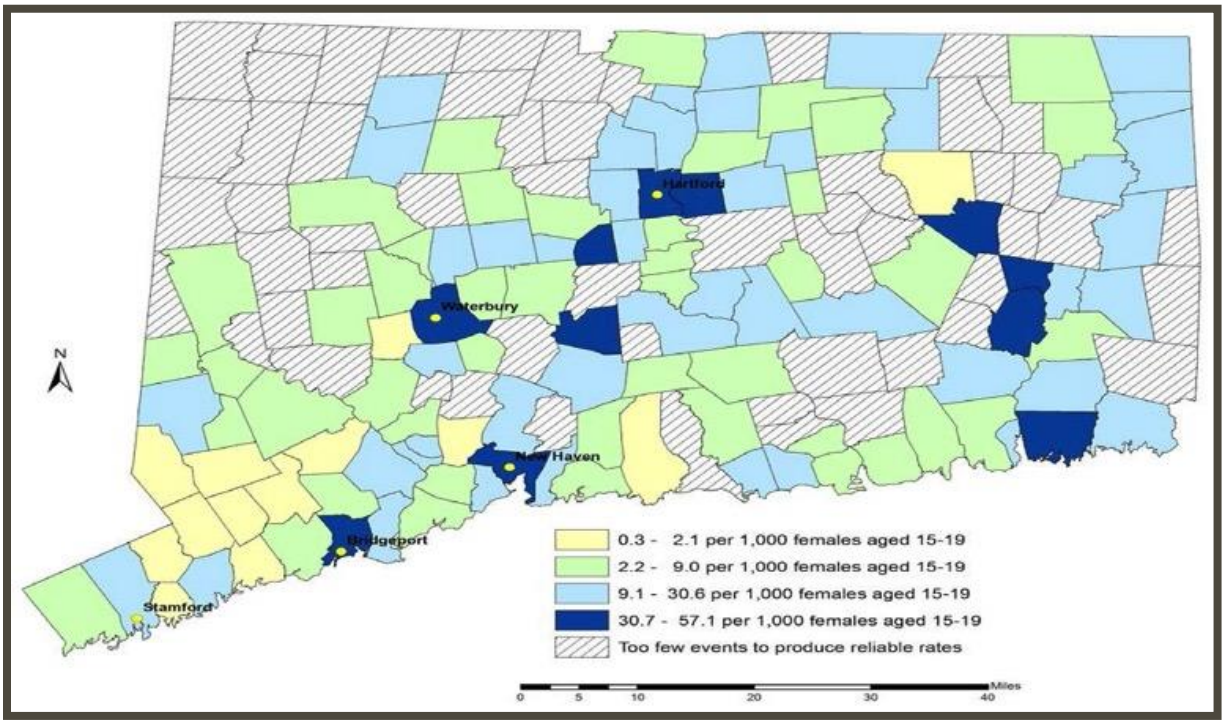
From 2007 to 2011 combined, the rate of births to teenage mothers was highest in Connecticut's largest towns and in towns in eastern Connecticut, as shown in dark blue in the map (Figure 42).

Figure 41: Birth Rates (2010)



Source: Connecticut Department of Public Health

Figure 42 - Births to Teen Mothers



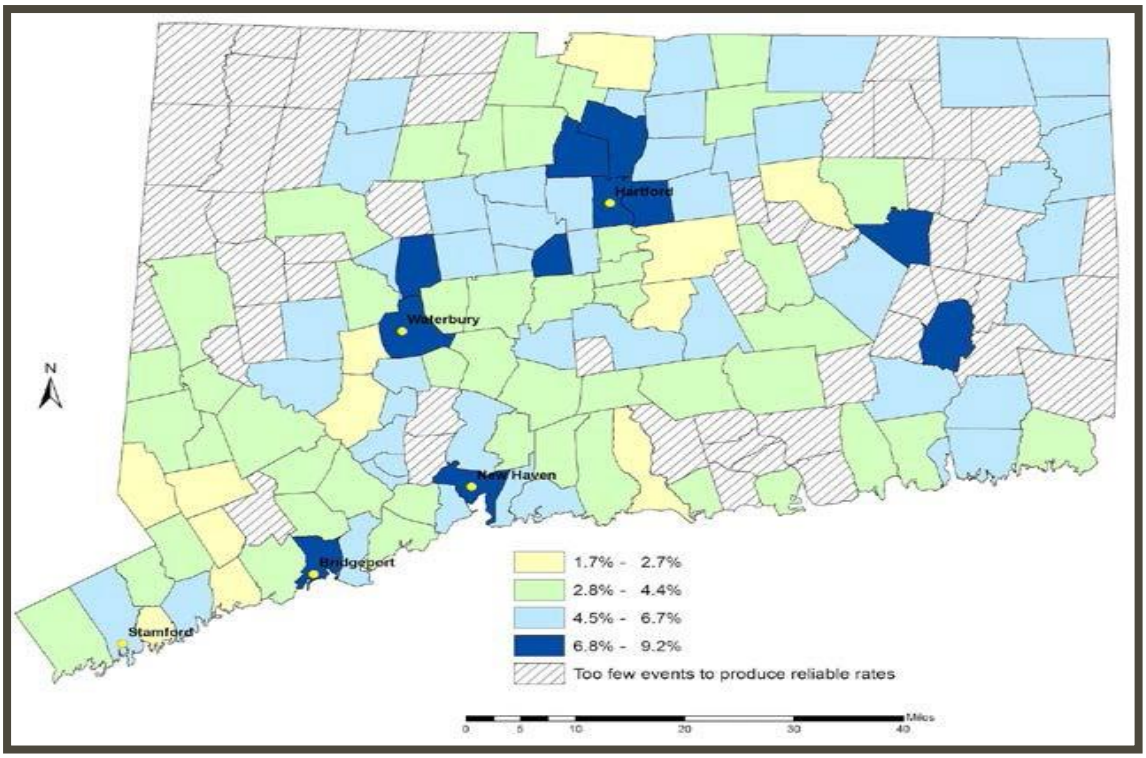
Source: Connecticut Department of Public Health, Health Statistics & Surveillance, Statistics & Analysis Reporting, 2007-2011. *Note: Teen Mothers defined as 15 to 19 years of age.

Preterm and Low Birth Weight

In 2013 the pre-term births as a percentage of live births statewide was 9.8%, and the percent of low birth weight babies was 7.8%.[34]

From 2007 to 2011 combined, preterm birth was more heavily concentrated in and around Waterbury, Hartford, and New Haven and in some Northern areas in Connecticut. The towns that experienced the greatest proportion of low birth weight births from 2007 to 2011, combined, included Hartford, Waterbury, New Haven, Bridgeport, their surrounding towns, and towns in the eastern region of Connecticut (Figure 43).

Figure 43 - Percent of Low Birth Weight Births



Source: Connecticut Department of Public Health, Health Statistics & Surveillance, Statistics & Analysis Reporting, 2007-2011.

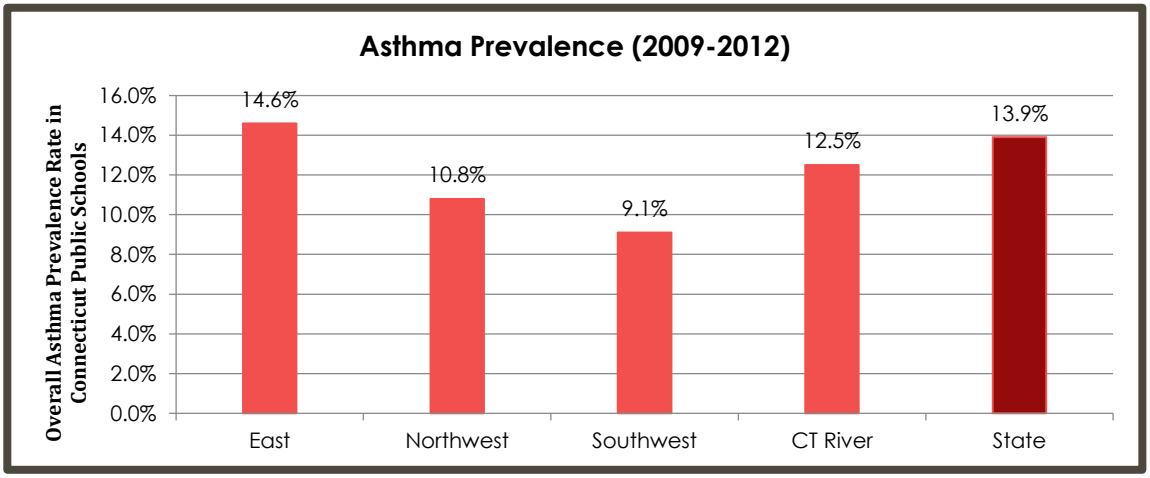
[34] Source: National Center for Health Statistics, National Vital Statistics Report, Births: Final Data for 2013, Table I-8

Chronic Disease

Asthma

According to the 2014 Connecticut School-Based Asthma Surveillance Report, the prevalence rate of asthma in the state is 13.9%. The only rural region in the state where the asthma rate was higher than the overall state rate is the East region with a rate of 14.6% (Figure 44).

Figure 44 - Asthma Prevalence in Public Schools



Source: Connecticut School-Based Asthma Surveillance Report 2014, Connecticut Department of Public Health. *Note: The following rural school districts were not included: Barkhamsted, Bethany, Bozrah, Bridgewater, Burlington, Canaan, Colebrook, Cornwall, Eastford, Kent, Lebanon, Lisbon, Norfolk, Roxbury, Union, and Warren.

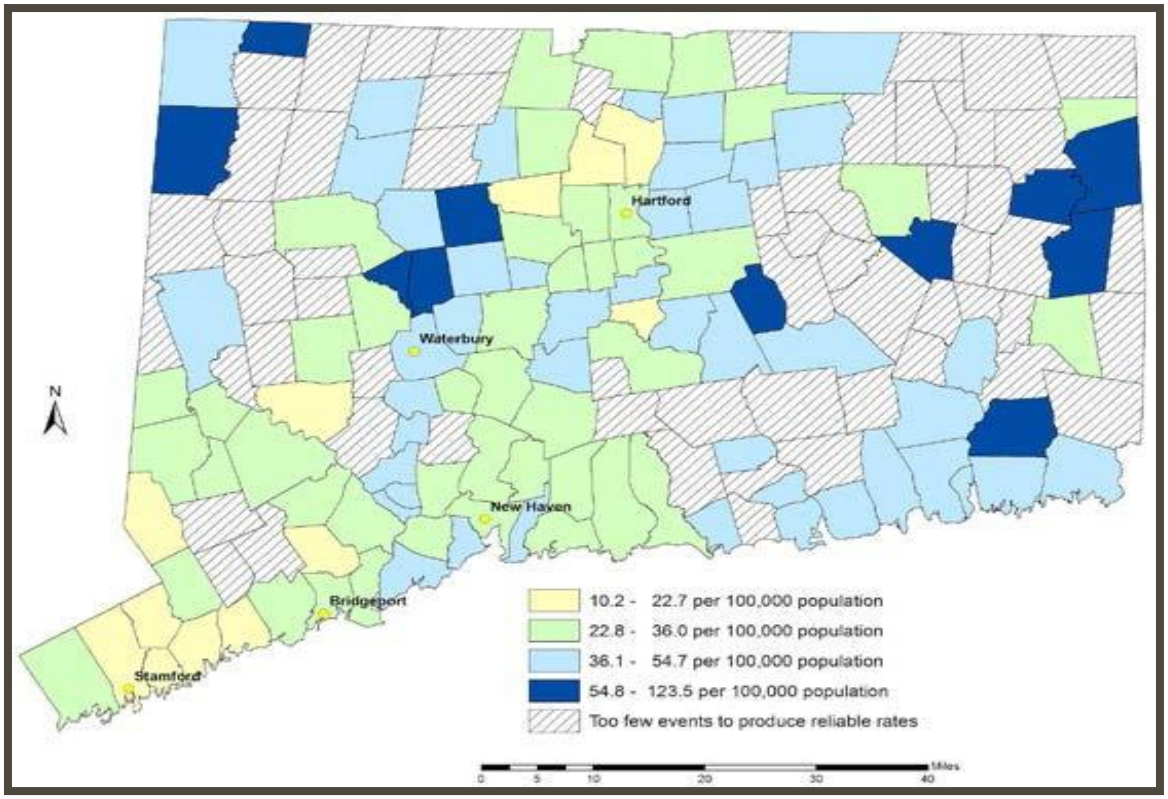
Chronic Lower Respiratory Disease

The leading causes of Chronic Lower Respiratory Disease, which includes diagnoses of either chronic obstructive pulmonary disease (COPD), chronic bronchitis, emphysema or asthma, include exposure to tobacco and environmental factors.[35] The age-adjusted self-reported prevalence of COPD which includes diagnoses of chronic bronchitis and emphysema nationally was reported to be 6.3% in 2011.[36] In Connecticut the overall age-adjusted prevalence was 5.7% which is lower than the national average.

Figure 45 presents age-adjusted mortality rates due to Chronic Lower Respiratory Disease reported to the Department of Public Health during the time period 2006-2010. Note that death rates were high (54.8-123.5 deaths per 100,000 population) in several rural towns, particularly in the far Northwestern region (Burlington, Sharon, North Canaan) and one town in the East region (Brooklyn).

[35] http://www.cdc.gov/healthcommunication/toolstemplates/entertainmented/tips/chronicrespiratorydisease.html
[36] http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6146a2.htm

Figure 45 - Age Adjusted Mortality Rate due to Chronic Lower Respiratory Disease



Source: Connecticut Department of Public Health, Health Statistics & Surveillance, Statistics & Analysis Reporting, 2006-2010.

Hepatitis C

The map in Figure 46 shows the geographic distribution of Hepatitis C, past or present across the state of Connecticut in 2013. The distribution of Hepatitis C varied across the state with the highest number of cases occurring in large urban cities.

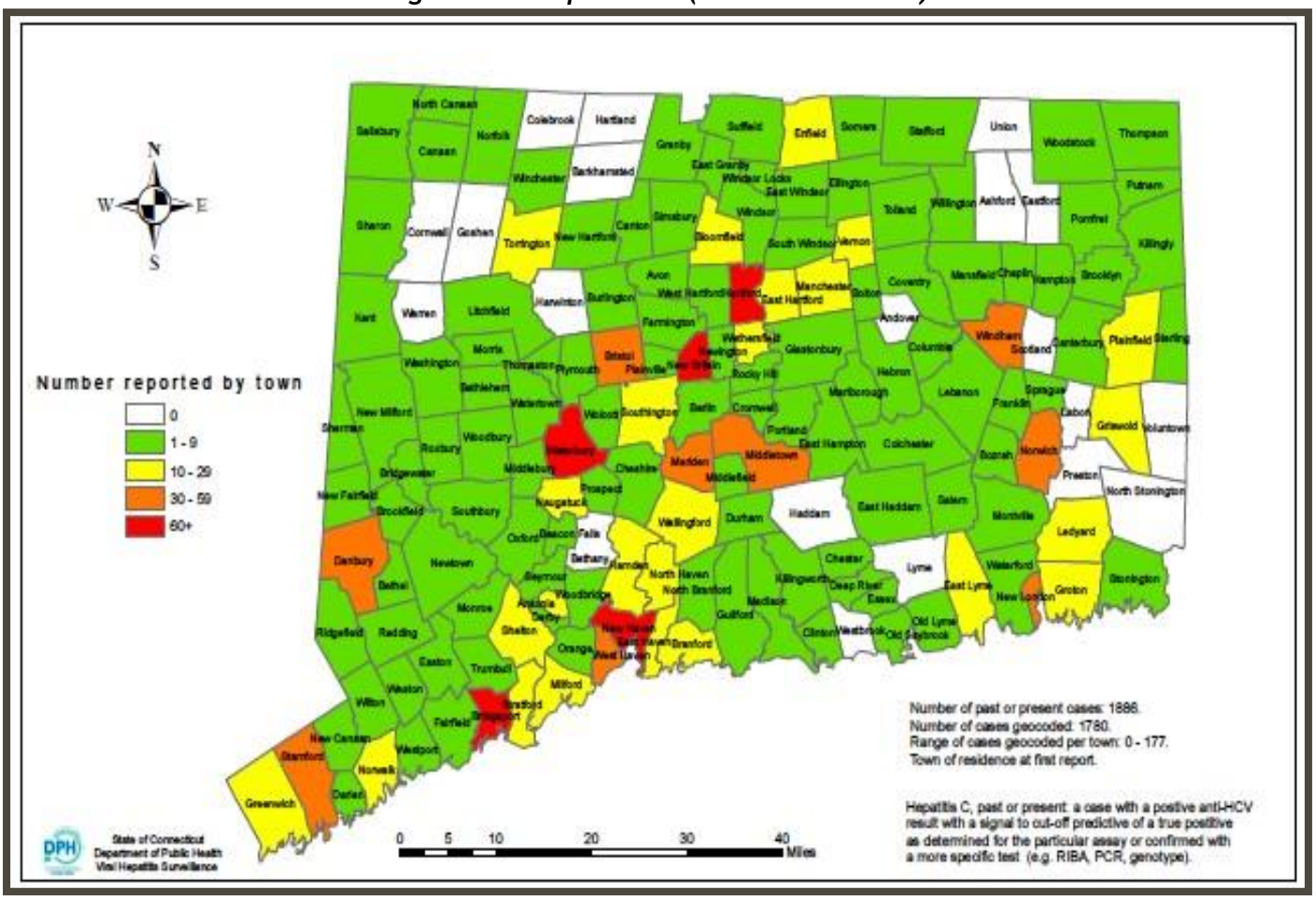
More recent data from 2014 shows a similar pattern. Of the 2,407 cases of Hepatitis C reported across the state the majority occurring in urban settings. Of the rural settings the East region had the most cases and the Southwest the fewest cases (Figure 47).

Figure 46 - Number of Hepatitis C Cases

Rural Cluster	Number of Cases (2014)	Total Number of Cases (2010-2014)
CT River Valley	23	129
East	88	346
Southwest	10	41
Northwest	43	179
State	2,407	10,402

Source: Connecticut Department of Public Health Viral Hepatitis Surveillance Program (2014)

Figure 47 – Hepatitis C (Past and Present)



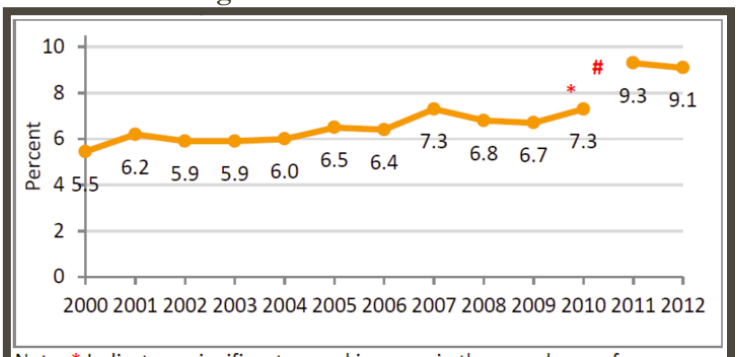
Source: Connecticut Department of Public Health AIDS and Chronic Diseases Section, Epidemiologic Profile of HIV/AIDS in Connecticut, 2013, Fig. 6.2.1.

Diabetes

Diabetes has been increasing incrementally in the state of Connecticut from a rate of just under 6% in 2000 to 9.1 % in 2012 (Figure 48). Data in 2013 show a slight decline in 2013 (8.3%; BRFSS). Nationally the rate was 9.3%.

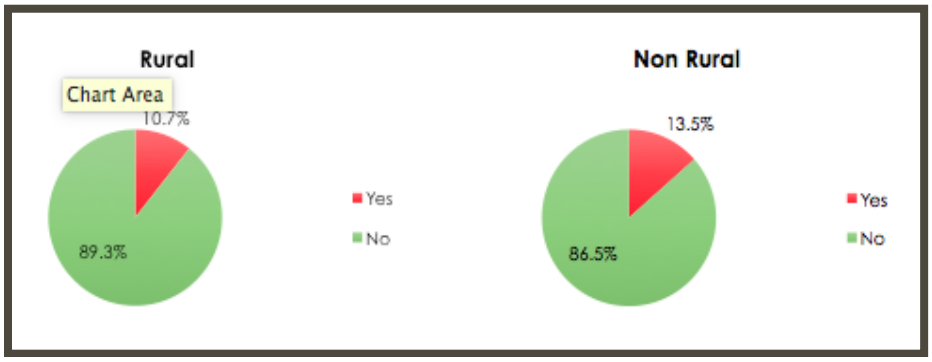
In contrast, the rates reported in the 2013 Connecticut Health Survey are higher for both the rural and non-rural populations of Connecticut (10.7% vs 13.5% respectively) (Figure 49). Both the BRFSS and Connecticut Health Surveys were based on self-reporting in regard to whether they were told by a physician if they had diabetes.

Figure 48 - Prevalence of Diabetes



Note: * Indicates a significant annual increase in the prevalence of reported diagnosis of diabetes from 2000 to 2010 ($p<0.05$). # Break in trend due to new weighting in 2011.
Source: Connecticut Department of Public Health, Connecticut Behavioral Risk Factor Surveillance System, 2000-2012.

Figure 49 - Have you ever been told by a doctor, nurse, or other health professional that you have diabetes or sugar diabetes?



Source: Connecticut Health Care Survey 2013

There were 690 reported deaths in CT due to diabetes in 2012. Of the 66,249 hospital discharges during 2012, there were 5,298 discharges where diabetes was the primary diagnosis and 13,250 that were diabetes-related (Connecticut Acute Care Hospital Inpatient Discharge Database).

Cancer

Cancer is the second leading cause of death in Connecticut. Overall there were an estimated 22,070 new cancer cases in the state in 2014.[37] According to the American Cancer Society, the most common cancers in Connecticut in 2015 will include breast, colorectal, lung, and prostate. [38] The age-adjusted cancer mortality rates for the rural regions of the state across the time frame of 2006-2010 are presented in Figure 50. The mortality rates were higher for all of the rural regions when compared to the state overall with the exception of the Northwestern region.

Figure 50: Age Adjusted Cancer Mortality Rates (2006-2010)

Rural Cluster	Age Adjusted Cancer Mortality Rate
CT River Valley	181.92
East	185.86
Northwest	167.43
Southwest	176.69
State	165.61

Source: Department of Public Health

A similar trend was found in the Connecticut Health Survey 2013 that included a question regarding whether you have ever been told by a health care practitioner that you have cancer. Rural residents were more likely to have a diagnosis of cancer when compared with their non-rural counterparts (13.6% rural vs 11.1% non-rural).

Chronic Disease – Rural Hospital Discharge Data

Rural hospital discharge data provides another way in which to examine health challenges and the need for targeted preventative programs and follow-up care in rural settings. Figure 51 presents inpatient discharge data for 2013 by disease classification systems. The data should be interpreted based on the bed size that varies across the four rural hospitals. The most common discharges are for diseases and disorders of the respiratory, circulatory and digestive

[37] American Cancer Society's Cancer Facts and Figures 2014
[38] http://www.cancer.org/acs/groups/content/@editorial/documents/document/acspc-044552.pdf

systems. When drawing comparisons, Charlotte Hungerford Hospital has more discharges overall with the exception of mental disorders, where Day Kimball Hospital is higher. Windham Hospital has far fewer discharges for mental disorders and/or alcohol/drug use which may be a result of their relationship to other community providers for mental health referrals.

Figure 51 - Primarily Rural Hospital Inpatient Discharge Data - Systems (2013)

Discharges for Diseases and Disorders	Charlotte Hungerford (109 beds)	Day Kimball (104 beds)	Sharon (78 beds)	Windham (130 beds)	Total Rural	Statewide
Nervous System	248	165	268	211	892	23,432
Respiratory System	916	514	332	621	2,383	39,930
Circulatory System	695	663	316	676	2,358	54,772
Digestive System	759	415	260	531	1,965	40,283
Musculoskeletal	562	388	199	279	1,428	37,291
Endocrine, Nutritional & Metabolic	199	106	72	150	527	13,499
Mental Disorders	522	700	176	13	1,411	24,838
Alcohol/Drug Use	200	27	78	19	324	7,309
Injuries, Poisonings, Toxic Effects of Drugs	86	40	28	82	236	6,281

Source: http://ctmonahrq.ct.gov/

Figure 52 presents hospital discharge data by a select set of diseases/disorders. Pneumonia followed by Chronic Pulmonary Obstructive Disease are the primary inpatient discharge conditions for all rural hospitals.

Figure 52 - Primarily Rural Hospital Inpatient Discharge Data - Specific Diseases (2013)

Disease	Charlotte Hungerford	Day Kimball	Sharon	Windham	Total Rural	Statewide
Diabetes mellitus with complications	75	47	22	67	211	5,288
Acute Myocardial Infarction	54	65	44	57	220	6,582
Coronary Atherosclerosis and Other Heart Disease	27	66	22	34	149	5,426
Nonspecific Chest Pain	52	137	25	64	278	4,435
Pneumonia	283	187	110	147	727	11,141
Chronic Obstructive Pulmonary Disease	223	125	64	121	533	6,619
Asthma	50	35	31	56	172	4,546

Source: http://ctmonahrq.ct.gov/

Mortality

Data on all-cause mortality by rural clusters is presented in Figure 53. There were 143,444 cumulative deaths in the state in the years 2006-2010. Both the CT River and the East had slightly higher rates than compared to the state overall. In particular, there were seven towns within rural areas that had higher than state level death rates.
These included:

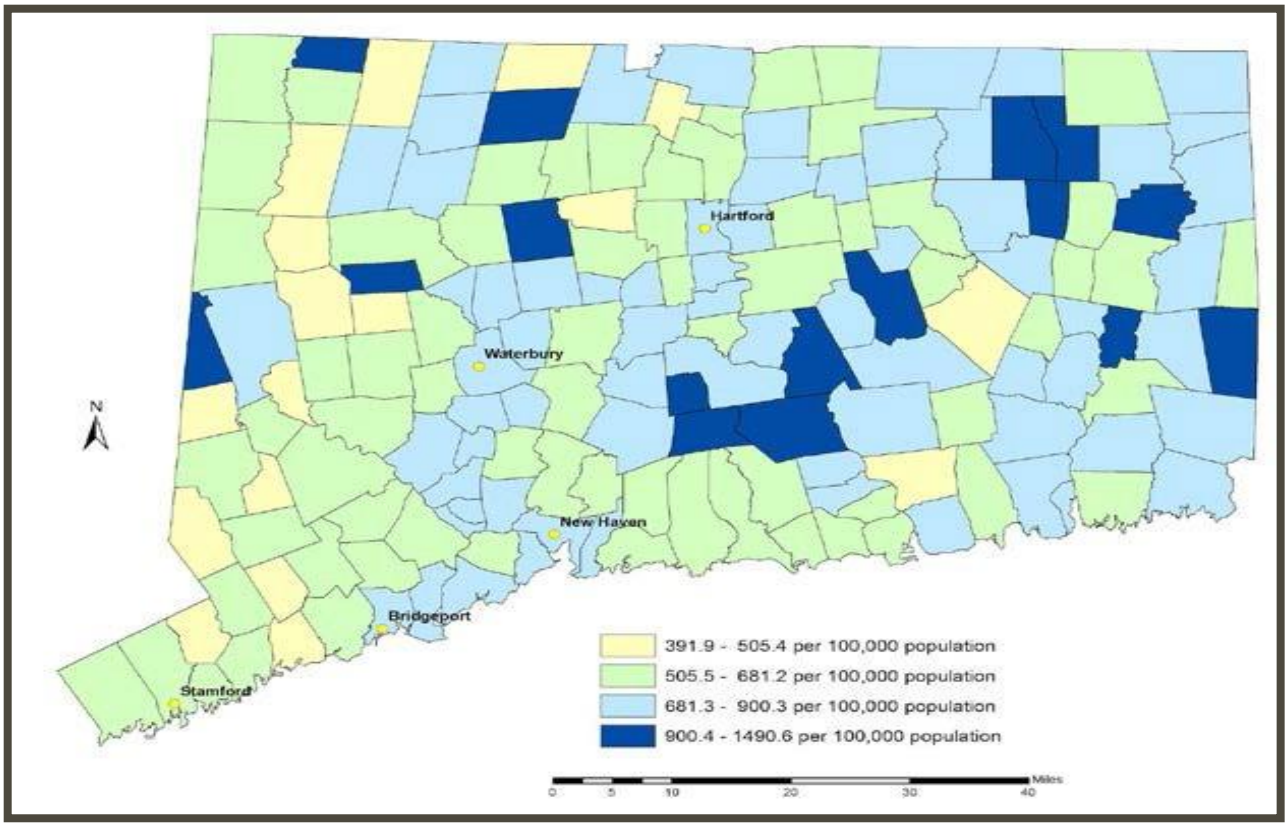
1) CRV – Haddam and Portland
2) East – Ashford and Brooklyn
3) Southwest – Woodbridge
4) Northwest – Burlington and North Canaan.

Figure 53 - All Cause Age Adjusted Mortality

All Cause - AAM per 100,000 (2006-2010)	
CT River Valley	734.89
East	754.73
Southwest	650.71
Northwest	687.47
State	679.27

Source: Connecticut Department of Public Health

Figure 54 - All Cause Mortality and Premature Mortality



Source: Connecticut Department of Public Health, Health Statistics & Surveillance, Statistics & Analysis Reporting, 2006-2010.

Figure 55 presents age-adjusted mortality rates per 100,000 population for heart disease, which is the leading cause of death in the state. All of the regions with the exception of the Southwestern region were higher than the state level with the Northwest region being significantly higher. The towns driving the high rates in the Northwest were North Canaan, Burlington, Morris, Sherman and Barkhamsted. The two towns with particularly high rates were North Canaan (AAMR 549.8) and Brooklyn (AAMR 293.0).

Figure 55 - Heart Disease Age Adjusted Mortality

Heart Disease Age-Adjusted Mortality per 100,000 (2006-2010)	
CT River Valley	182.08
East	185.35
Northwest	219.24
Southwest	138.91
State	164.65

Source: Connecticut Department of Public Health; http://www.ct.gov/dph/lib/dph/hisr/instantatlas/lcod/atlas.html

Additional Community Level Data

Health Outcomes Index

Figure 56 presents the results of an analysis completed by the DPH in 2014 that addresses health outcomes and unmet needs by rural clusters. The state derived an algorithm for each of these indexes and data were provided for each town (refer to Appendix for town level data). The Health Index is a composite of population estimates, vital records, mortality and birth tables as well as hospital discharge data including CHIME. The Unmet Need Index is based on the sum of socioeconomic status and health outcomes indices. Based on these data none of the rural clusters were below the state level for either index.

Figure 56 - Access and Unmet Need Indices

Rural Cluster	Health Outcomes	Unmet Need
CT River Valley	3.1	8.6
East	3.2	9.8
Southwest	3.3	9.3
Northwest	3.2	9.7
State	5.0	15.0

Source: Connecticut Department of Public Health; Statewide Health Care Facilities and Services Plan (2014)

Data Strengths & Challenges

A major focus of this report was to identify and present relevant data at the rural cluster and/or town level for the purpose of targeted rural health assessment and strategic planning. Obtaining rural specific data proved to be challenging. Some types of data were either non-existent, dated or there were barriers to access. Demographic, mortality data, most vital statistics, and hospital specific utilization data were available at the town level and were analyzed by rural cluster. The rural specific data most difficult to identify included:

- Tobacco use
- Drug and alcohol use and abuse
- Overweight/obesity (e.g. weight, BMI)
- Physical activity levels in adults and children
- Quality of life

Despite these limitations there was meaningful data obtained on a number of important health indicators. Moreover, grouping the data into 'rural clusters' provides a way in which targeted program planning can occur where there are limited resources. Data collection is occurring at multiple state and county levels but not all agencies have the resources to analyze, collate into demographic groupings and disseminate in a timely manner. By having access to current relevant data, targeted interventions can be implemented.

Appendices

I. Rural Towns Definition and Rural Cluster Category (2014)

	Town	County	ZIP	Rural Cluster
1	Andover	Tolland	06232	E
2	Ashford	Windham	06278	E
3	Barkhamsted	Litchfield	06063	NW
4	Bethany	New Haven	06524	SW
5	Bethlehem	Litchfield	06751	NW
6	Bolton	Tolland	06043	E
7	Bozrah	New London	06334	E
8	Bridgewater	Litchfield	06752	NW
9	Brooklyn	Windham	06234	E
10	Burlington	Hartford	06013	NW
11	Canaan	Litchfield	06018	NW
12	Canterbury	Windham	06331	E
13	Chaplin	Windham	06235	E
14	Chester	Middlesex	06412	CRV
15	Colebrook	Litchfield	06021	NW
16	Columbia	Tolland	06237	E
17	Cornwall	Litchfield	06753	NW
18	Deep River	Middlesex	06417	CRV
19	Durham	Middlesex	06422	CRV
20	East Granby	Hartford	06026	NW
21	East Haddam	Middlesex	06423	CRV
22	Eastford	Windham	06242	E
23	Easton	Fairfield	06612	SW
24	Franklin	New London	06254	E
25	Goshen	Litchfield	06756	NW
26	Haddam	Middlesex	06438	CRV
27	Hampton	Windham	06247	E
28	Hartland	Hartford	06027	NW
29	Harwinton	Litchfield	06791	NW
30	Hebron	Tolland	06248	E
31	Kent	Litchfield	06757	NW
32	Killingworth	Middlesex	06419	CRV
33	Lebanon	New London	06249	E
34	Lisbon	New London	06351	E
35	Litchfield	Litchfield	06759	NW

36	Lyme	New London	06371	CRV
37	Marlborough	Hartford	06447	E
38	Middlebury	New Haven	06762	SW
39	Middlefield	Middlesex	06455	CRV
40	Morris	Litchfield	06763	NW
41	New Hartford	Litchfield	06057	NW
42	Norfolk	Litchfield	06058	NW
43	North Stonington	New London	06359	E
44	North Canaan	Litchfield	06018	NW
45	Old Lyme	New London	06371	CRV
46	Pomfret	Windham	06258	E
47	Portland	Middlesex	06480	CRV
48	Preston	New London	06365	E
49	Putnam	Windham	06260	E
50	Redding	Fairfield	06896	SW
51	Roxbury	Litchfield	06783	NW
52	Salem	New London	06420	E
53	Salisbury	Litchfield	06068	NW
54	Scotland	Windham	06264	E
55	Sharon	Litchfield	06069	NW
56	Sherman	Fairfield	06784	NW
57	Sprague	New London	06330	E
58	Sterling	Windham	06377	E
59	Thompson	Windham	06277	E
60	Union	Tolland	06076	E
61	Voluntown	New London	06384	E
62	Warren	Litchfield	06754	NW
63	Washington Depot	Litchfield	06794	NW
64	Westbrook	Middlesex	06498	CRV
65	Willington	Tolland	06279	E
66	Woodbridge	New Haven	06525	SW
67	Woodbury	Litchfield	06798	NW
68	Woodstock	Windham	06281	E

II. Students Eligible for Free or Reduced Price Lunches by Rural Town (State Department of Education 2010-2011)

School District	Students Eligible for Free - or Reduced - Price School Lunch
Andover	39 (11.7)
Ashford	109 (22.9)
Barkhamsted	24 (7.0)
Bethany	23 (4.5)
Bolton	101 (11.3)
Bozrah	43 (18.4)
Brooklyn	218 (23.0)
Canaan	8 (9.3)
Canterbury	110 (21.0)
Chaplin	50 (26.7)
Chester	29 (10.5)
Colebrook	16 (14.3)
Columbia	59 (10.9)
Cornwall	13 (11.3)
Deep River	53 (15.1)
East Granby	31 (3.5)
East Haddam	160 (12.0)
Eastford	17 (9.6)
Easton	16 (1.5)
Franklin	29 (13.1)
Hampton	26 (18.7)
Hartland	6 (2.7)
Hebron	55 (4.8)
Kent	37 (12.9)
Lebanon	171 (12.2)
Lisbon	103 (19.3)
Litchfield	110 (9.4)
Marlborough	42 (6.2)
New Hartford	35 (5.8)
Norfolk	10 (7.5)
North Canaan	77 (24.2)
Pomfret	59 (11.5)
Portland	191 (13.6)

School District	Students Eligible for Free - or Reduced - Price School Lunch
South Preston	67 (15.6)
Putnam	732 (56.9)
Redding	28 (2.3)
Regional School District 4	76 (7.8)
Regional School District 5	71 (2.9)
Regional School District 6	126 (12.1)
Regional School District 7	60 (5.5)
Regional School District 8	113 (6.4)
Regional School District 9	15 (1.5)
Regional School District 10	109 (4.0)
Regional School District 11	66 (24.1)
Regional School District 12	63 (6.9)
Regional School District 13	118 (5.8)
Regional School District 14	170 (8.3)
Regional School District 15	170 (3.8)
Regional School District 17	167 (6.8)
Regional School District 18	107 (7.2)
Regional School District 19	154 (13.0)
Salem	33 (7.2)
Salisbury	32 (10.3)
Scotland	17 (11.9)
Sharon	37 (18.8)
Sherman	27 (6.6)
Sprague	149 (40.2)
Sterling	154 (32.0)
Thompson	382 (30.2)
Union	3 (3.7)
Voluntown	51 (16.3)
Westbrook	101 (10.7)
Willington	93 (18.2)
Woodbridge	31 (4.3)
Woodstock	47 (4.3)

III. Regional School Districts

Regional School District 4 – Deep River
Regional School District 5 – Bethany, Orange, and Woodbridge
Regional School District 6 – Warren, Morris, and Goshen
Regional School District 7 – Barkhamsted, Colebrook, New Hartford, and Norfolk
Regional School District 8 – Hebron, Andover, and Marlborough
Regional School District 9 – Easton and Redding
Regional School District 10 – Burlington and Harwinton
Regional School District 11 – Chaplin, Hampton, and Scotland
Regional School District 12 – Washington Depot
Regional School District 13 – Durham and Middlefield
Regional School District 14 – Woodbury and Bethlehem
Regional School District 15 – Middlebury and Southbury
Regional School District 17 – Haddam and Killingworth
Regional School District 18 – Lyme and Old Lyme
Regional School District 19 – Ashford, Mansfield, and Willington

*Note: Towns Not Included in School District Data- Bridgewater, Burlington, Kent, Lebanon, Lisbon, Roxbury, and Warren

IV. Lead Poisoning: Number of Confirmed Cases by Rural Town

Town	Number of Cases
Andover	35
Ashford	68
Barkhamsted	39
Bethany	61
Bethlehem	39
Bolton	63
Bozrah	20
Bridgewater	6
Brooklyn	148
Burlington	133
Canaan	10
Canterbury	78
Chaplin	29
Chester	55
Colebrook	3
Columbia	69
Cornwall	18
Deep River	56
Durham	110
East Granby	78
East Haddam	110
Eastford	19
Easton	81

Town	Number of Cases
Franklin	16
Goshen	30
Haddam	61
Hampton	63
Hartland	19
Harwinton	67
Hebron	81
Kent	26
Killingworth	73
Lebanon	81
Lisbon	32
Litchfield	72
Lyme	1
Marlborough	67
Middlebury	98
Middlefield	43
Morris	28
New Hartford	76
Norfolk	11
North	77
North Canaan	24
Old Lyme	115
Pomfret	86

Town	Number of Cases
Portland	138
Preston	57
Putnam	262
Redding	91
Roxbury	19
Salem	46
Salisbury	17
Scotland	10
Sharon	17
Sherman	24
Sprague	71
Sterling	72
Thompson	185
Union	9
Voluntown	37
Warren	3
Washington Depot	34
Westbrook	89
Willington	88
Woodbridge	115
Woodbury	110
Woodstock	131

Source: Connecticut Department of Public Health

V. Lead Screening by Rural Town

Town	Zone	Number of Children Under Age 6 Screened	Population Age 9 months-2 years	Number of Children Age 9 months-2 years Screened	Percentage of Children Age 9 months-2years Screened
Chester	CRV	56	57	53	93
Deep River	CRV	59	75	59	79
Durham	CRV	112	122	101	83
East Haddam	CRV	112	147	104	71
Haddam	CRV	118	157	115	73
Killingworth	CRV	74	78	68	87
Lyme	CRV	117	101	107	100
Middlefield	CRV	44	75	40	53
Old Lyme	CRV	117	101	107	100
Portland	CRV	142	185	134	72
Westbrook	CRV	91	95	86	91
Andover	E	35	45	25	56
Ashford	E	68	87	58	67
Bolton	E	64	71	51	72
Bozrah	E	20	38	17	45
Brooklyn	E	150	139	96	69
Canterbury	E	78	77	61	79
Chaplin	E	29	44	25	57
Columbia	E	70	95	63	66
Eastford	E	19	22	16	73
Franklin	E	16	28	13	46
Hampton	E	28	31	25	81
Hebron	E	85	156	75	48
Lebanon	E	81	119	73	61
Lisbon	E	32	67	27	40
Marlborough	E	68	91	64	70
North Stonington	E	78	60	63	100
Pomfret	E	86	71	51	72
Preston	E	57	68	52	76
Putnam	E	268	182	174	96
Salem	E	46	61	36	59
Scotland	E	10	28	10	36
Sprague	E	72	60	56	93
Sterling	E	73	47	44	94
Thompson	E	185	110	113	100
Union	E	10	15	10	67
Voluntown	E	37	41	25	61
Willington	E	89	86	73	85
Woodstock	E	134	90	78	87
Barkhamsted	NW	40	39	33	85
Bethlehem	NW	39	42	24	57
Bridgewater	NW	6	13	6	46

Burlington	NW	133	131	104	79
Canaan	NW	10	26	7	27
Colebrook	NW	3	15	2	13
Cornwall	NW	19	17	18	100
East Granby	NW	80	112	60	54
Goshen	NW	31	28	30	100
Hartland	NW	19	27	17	63
Harwinton	NW	68	71	59	83
Kent	NW	26	31	25	81
Litchfield	NW	76	105	63	60
Morris	NW	28	37	23	62
New Hartford	NW	79	113	69	61
Norfolk	NW	14	19	11	58
North Canaan	NW	25	46	19	41
Roxbury	NW	19	26	19	73
Salisbury	NW	18	42	14	33
Sharon	NW	17	26	15	58
Sherman	NW	24	32	23	72
Warren	NW	3	13	2	23
Washington	NW	35	50	32	64
Woodbury	NW	110	131	87	66

VI. Hepatitis C: Cases by Rural Town

Town	Cases (2014)	Total Cases (2010-2014)	Town	Cases (2014)	Total Cases (2010-2014)
Andover	1	3	North Canaan	4	12
Ashford	2	9	Old Lyme	2	12
Barkhamsted	1	5	Pomfret	1	10
Bethany	2	7	Portland	2	24
Bethlehem	2	8	Preston	2	7
Bolton	5	11	Putnam	17	46
Bozrah	4	12	Redding	0	7
Bridgewater	2	5	Roxbury	0	2
Brooklyn	7	26	Salem	1	6
Burlington	4	13	Salisbury	0	6
Canaan	2	3	Scotland	0	1
Canterbury	4	13	Sharon	2	16
Chaplin	3	12	Sherman	1	6
Chester	2	9	Sprague	2	18
Colebrook	0	1	Sterling	0	17
Columbia	5	16	Thompson	8	27
Cornwall	0	1	Union	0	1
Deep River	2	8	Voluntown	4	8
Durham	0	10	Warren	0	2
East Granby	5	9	Washington	0	4
East Haddam	2	14	Westbrook	5	17
Eastford	0	1	Willington	4	17
Easton	2	5	Woodbridge	0	8
Franklin	4	9	Woodbury	3	16
Goshen	3	5	Woodstock	1	17
Haddam	2	8	Source: Connecticut Department of Public Health		
Hampton	2	9	Viral Hepatitis Surveillance Program		
Hartland	N/A	N/A			
Harwinton	3	9			
Hebron	2	11			
Kent	1	11			
Killingworth	3	13			
Lebanon	7	25			
Lisbon	N/A	N/A			
Litchfield	3	18			
Lyme	1	2			
Marlborough	1	7			
Middlebury	6	14			
Middlefield	2	12			
Morris	2	6			
New Hartford	4	17			
Norfolk	1	4			
North Stonington	1	7			

VII. Access and Unmet Need Indices by Rural Town

	Health Outcomes Index[39]	Unmet Need Composite Index[40]
Andover	2.7	7.3
Ashford	3.0	10.1
Barkhamsted	3.0	7.0
Bethany	2.6	7.9
Bethlehem	5.0	11.3
Bolton	2.7	9.1
Bozrah	3.4	9.5
Bridgewater	2.6	9.6
Brooklyn	3.4	11.8
Burlington	2.2	6.8
Canaan	3.0	11.7
Canterbury	3.2	10.8
Chaplin	3.5	10.3
Chester	4.2	11.2
Colebrook	2.7	8.8
Columbia	3.1	8.6
Cornwall	2.3	9.0
Deep River	3.1	12.0
Durham	2.5	7.2
East Granby	2.5	8.4
East Haddam	2.7	8.0
Eastford	2.6	8.2
Easton	2.0	6.9
Franklin	3.2	8,8
Goshen	3.0	9,1
Haddam	2.7	7.3
Hampton	3.1	9.5
Hartland	2.4	8.2
Harwinton	3.1	9.6
Hebron	2.5	7.0
Kent	3.9	11.2
Killingworth	2.8	8.1
Lebanon	3.0	9.6
Lisbon	3.6	10.0

	Health Outcomes Index[39]	Unmet Need Composite Index[40]
Litchfield	3.9	10.2
Lyme	2.6	9.3
Marlborough	2.9	7.7
Middlebury	5.3	12.4
Middlefield	3.0	7.4
Morris	3.7	9.8
New Hartford	2.3	7.8
Norfolk	2.7	10.8
North Canaan	4.2	14.3
North Stonington	2.3	8.0
Old Lyme	3.4	8.5
Pomfret	2.2	9.0
Portland	3.8	3.8
Preston	4.1	13.7
Putnam	4.1	15.4
Redding	2.9	8.8
Roxbury	3.0	8.5
Salem	2.5	7.3
Salisbury	3.5	11.5
Scotland	2.6	8.0
Sharon	4.3	11.0
Sherman	2.4	7.6
Sprague	4.4	11.2
Sterling	2.3	11.3
Thompson	2.6	10.0
Union	7.9	13.6
Voluntown	3.5	9.9
Warren	2.1	8.5
Washington Depot	2.9	10.5
Westbrook	3.7	12.0
Willington	2.5	9.1
Woodbridge	3.9	10.3
Woodbury	5.0	10.9
Woodstock	2.4	8.2

Source: Connecticut Department of Public Health; Statewide Health Care Facilities and Services Plan (2014)

[39] Based on data from Department of Public Health Population Estimates, Vital Records, Mortality and Birth Tables, Office of Health Care Access Acute Care Hospital Inpatient Discharge Database and Connecticut Hospital Association's ChimeData.

[40] Sum of Socioeconomic Status and Health Outcomes Indices.

VIII. **Methodology: Leading Causes of Death Data in Connecticut**

Leading Causes of Death
Cause of death categories and their range of ICD-10 codes are those used by the Centers for Disease Control and Prevention/National Center for Health Statistics. The 10 leading causes of death selected as Indicators are based on the ranking of Connecticut resident deaths aggregated for the most recent five years being shown.

Age-Adjusted Mortality Rates (AAMR)
AAMRs are calculated when there are at least 15 deaths within a town for a specific cause-of-death. Otherwise the rates are suppressed. Many towns do not meet this threshold. To maximize the number of towns that are evaluated, death data for five years are aggregated. Standardized, age-adjusted rates per 100,000 population are computed by the direct method based on the 2000 U.S. census population age distribution. The number of deaths used in the numerator is the total number of deaths registered as Connecticut residents with the State of Connecticut, where age at death was known.
The population data used to calculate the rates varied by time period and geography. For 2006-2010 town-level statistics, the denominators are based on the American Community Survey (ACS) 5-year population estimates for Connecticut towns by age and sex.
For 2001-2005 town-level statistics (for which ACS estimates were not available), the denominators are based on the Connecticut July 1, 2000 town-level, bridged-race-population estimates by age and sex, available at: http://www.ct.gov/dph/populationdata.
For state-level statistics, the denominators are based on the NCHS' bridged-race postcensal population estimates for Connecticut. The original vintage of the population datasets by age, sex, race, and Hispanic origin (ASRH) are used for each year with the exception of 2010. For 2010, original vintage ASRH population estimates are not available, so vintage 2011 estimates of the 2010 population are used.

Statistical Assessments of AAMR Town-State Comparisons
The map emphasizes the town-state differences that are statistically significant after adjustment for the total number of towns being compared. The Holm method was used for evaluating multiple town comparisons. Three colors [labeled 'Higher than state', 'Lower than state', and 'Not different'] are displayed for town rates evaluated by this method. A town is shaded white if its death count is too low (< 15) to produce a reliable rate.
Additional single-test comparisons that address whether a specific town's rate is significantly different from the state rate can be found in the data available for download. The confidence limits shown in the data Table and displayed in the Bar Chart are used for the single-test comparisons.

Excess Deaths
The downloadable data file also displays the number of Excess Deaths by town. Excess Deaths are the estimated number of deaths that would not have occurred if the town had the same rate as the state. The estimated excess deaths use the overall age-adjusted rate as the basis for assessing the relative risk for each town.
More Connecticut mortality data and information can be found at:
http://www.ct.gov/dph/mortality

IX. Description of the School-based Asthma Surveillance System

CGS §10-206 requires that public schools annually report to the DPH information on students with asthma. A student is considered as having asthma if he/she meets any of the following conditions: 1) has a provider's diagnosis of asthma indicated on the Health Assessment Record (HAR), 2) has a provider Asthma Action Plan (AAP) on file, 3) has a provider medication order for asthma medication on file, 4) has self-carry medication approval, 5) has asthma medication in school, 6) has a parental note on file indicating the child has asthma, 7) shows symptoms of asthma, or 8) any other indications that the child is suffering from asthma. Information on students with asthma include: school, grade, age, gender, race, ethnicity, asthma documentation, asthma severity, and health history. This information is only reported for students with asthma in grades requiring the HAR: prior to public school entrance (Pre-Kindergarten (PK) or Kindergarten (K) for elementary schools); in grade 6 or 7 for middle schools; and in grade 9 or 10 for high schools. In order to facilitate this process, DPH and the State Department of Education (SDE) developed reporting forms for use by school nurses. At the beginning of each school year, these forms are distributed to individual school nurses through the school district nurse supervisors. School district nurse supervisors then collect the completed forms in their school districts and submit them to DPH by September of the subsequent school year. All data are entered into the SBASS, a Microsoft Access database, by trained DPH staff. Data quality checks are then performed to ensure the accuracy and completeness of the data entered.

Method for Asthma Rate Calculations

Each local or regional board of education chooses which grades require an HAR based on the options provided by the legislation. More specifically, it is up to the school district to decide whether to require an HAR for students in grades PK or K, 6 or 7, and 9 or 10. School nurses are required to submit to DPH asthma data on the grades that require an HAR only, but some submit data on other grades as well. School district nurse supervisors are asked to report specifically which grades required an HAR in their school districts.

Asthma rates were calculated by dividing the number of students with asthma by the total number of children enrolled in the required grades of the school district. However, for some school districts, it was still unclear which grades to include in the rates calculation because the grades specified by the school district nurse supervisors as requiring an HAR differed from the grades that were actually reported for students with asthma. For example, a school district may have indicated that grade 6 was the required grade for asthma data submission, and while some nurses within the school district submitted asthma data for grade 6, others may have submitted asthma data for grade 7 instead. In other instances, the school district may have indicated that both grades 6 and 7 were the required grades for asthma data submission, but only grade 6 asthma data was submitted. In these instances it was very difficult to decipher which grades in the school district should be used in the calculation of asthma rates.

In light of these issues, the following steps were taken to calculate asthma rates for each school district: First, only public schools with enrollment data obtained from SDE were included in the rates calculation (98% of the reporting public schools met this criterion). Second, the grades with the highest number of students reported as having asthma at the elementary, middle, and high school level for each school were included for rate calculations. Specifically, for each school, the grade with the highest number of students with asthma in grade PK or K was selected for elementary school rates calculation. The grade with the highest number of students with asthma in grade 5, 6, or 7 was selected for middle school rate calculations (some school districts reported grade 5). The grade with the highest number of students with asthma in grade 9, 10, or 11 was selected for high school rate calculations. This methodology ensured that the appropriate grades for each school are used in rate calculations. For some schools that reported multiple grades for each school level of entry, it

was hypothesized that the grades with the highest number of students reported as having asthma represented the more complete and accurate reports than the other grades.
For the calculation of the elementary school level asthma rate, 89% of the reports used were of grade K and 11% were of grade PK. For the middle school level rate calculation, 77% of the reports used were of grade 6, 22% were of grade 7, and 1% were of grade 5. For the high school level rate calculation, 68% of the reports used were of grade 10, 28% were of grade 9, and 4% were of grade 11. In addition to the asthma prevalence rate, a 95% confidence interval (CI) was generated for each rate. Testing for statistical significance was done at the $p<0.05$ level.
For all other information in this report that did not involve the use of enrollment data to calculate rates, analyses were performed based on all grades (PK – 12). The elementary school level was considered to consist of grades PK – 5, middle school level was grades 6 – 8, and high school level was grades 9 – 12.

X. Home–Based Health Care Providers – Rural Settings

1. Quality Visiting Nurses, LLC, Watertown (NW)
2. Western Connecticut Home Care, Inc. Danbury (NW)
3. Gentiva Health Services, Farmington (NW)
4. Interim Healthcare of Hartford, Inc. Farmington (NW)
5. VNA Northwest Inc., Bantam (NW)
6. Staff Mates Home Care, Hebron (E)
7. Salisbury Visiting Nursing Association, Inc., Salisbury (NW)
8. New Milford Visiting Nurse Association, Inc., New Milford (NW)
9. Day Kimball Home Care, Putnam (E)
10. Visiting Nurse Agency, Quinebaug (E)
11. McLean Home Care and Hospice, Simsbury (NW)
12. Farmington Valley Visiting Nurse Association, Simsbury (NW)
13. Visiting Nurse and Health Services of Connecticut, Vernon (E)
14. Backus Home Health Care, Norwich (E)
15. Visiting Nurses of the Lower Valley, Centerbrook (CRV)
16. Ledyard Regional Visiting Nurse Agency, Ledyard (E)
17. Naugatuck Visiting Nurses Association, Naugatuck (SW)
18. Foothills Visiting Nurse and Home Care, Inc. Winsted (NW)
19. Westbrook Visiting Nurses and Public Health, Westbrook (CRV)
20. VNA Health at Home, Inc., Watertown (CRV)
21. Seniorbridge Family Companies (CT), Inc., Madison (CRV)
22. Lighthouse Home Health Care, LLC, Old Saybrook (CRV)
23. Compassion in Care Nursing, Prospect (SW)

XI. Connecticut Health Reference Groups

Health Reference Groups
Urban centers: Bridgeport, Hartford, New Haven. **Manufacturing centers:** Danbury, East Hartford, Meriden, New Britain, New London, Norwalk, Stamford, Waterbury, West Haven, Windham. **Diverse suburbs:** Ansonia, Bloomfield, Bristol, Derby, Enfield, Groton, Hamden, Manchester, Middletown, Naugatuck, Norwich, Stratford, Vernon, West Hartford, Windsor. **Wealthy suburbs:** Avon, Bridgewater, Brookfield, Fairfield, Greenwich, New Canaan, Old Lyme, Redding, Ridgefield, Simsbury, Weston, Wilton, Woodbridge, Darien, Easton, Essex, Glastonbury, Guilford, Killingworth, Lyme, Madison, New Fairfield, Newtown, Roxbury, Trumbull, Washington, Westport. **Mill towns:** Bethel, Branford, Brooklyn, Griswold, Lisbon, North Canaan, Plainville, Plymouth, Putnam, Seymour, Southington, Stafford, Sterling, Cromwell, East Haven, East Windsor, Killingly, Mansfield, Milford, Montville, Newington, North Haven, Plainfield, Rocky Hill, Shelton, Somers, Sprague, Stonington, Thomaston, Thompson, Torrington, Wallingford, Waterford, Watertown, Wethersfield, Willington, Winchester, Windsor Locks, Wolcott. **Rural towns**: Andover, Ashford, Barkhamsted, Beacon Falls, Berlin, Bethany, Bethlehem, Bolton, Bozrah, Burlington, Canaan, Canterbury, Canton, Chaplin, Cheshire, Chester Clinton, Colchester, Colebrook, Columbia, Cornwall, Coventry, Deep River, Durham, East Granby, East Haddam, East Hampton, East Lyme, Eastford, Ellington, Farmington, Franklin, Goshen, Granby, Haddam, Hampton, Hartland, Harwinton, Hebron, Kent, Lebanon, Ledyard, Litchfield, Marlborough, Middlebury, Middlefield, Monroe, Morris, New Hartford, New Milford, North Stonington, Norfolk, North Branford, Old Saybrook, Orange, Oxford, Pomfret, Portland, Preston, Prospect, Salem, Salisbury, Scotland, Sharon, Sherman, South Windsor, Southbury, Suffield, Tolland, Union, Voluntown, Warren, Westbrook, Woodbury, Woodstock
Source: Connecticut Health Foundation, 2007;
http://www.ct.gov/oha/lib/oha/equitycommission/documents/execsummary.pdf

XII. Lyme Rates Per 100,000 Population (Probable and Confirmed) by Rural Town

Town	Cases 2010	Rate 2010	Cases 2013	Rate 2013	Zone
Chester	5	134	6	150.2	CRV
Deep River	5	108	4	86.4	CRV
Durham	6	91	6	81.2	CRV
East Haddam	13	156	26	284.9	CRV
Haddam	11	154	20	239.6	CRV
Killingworth	9	150	13	199.2	CRV
Lyme	3	149	4	166.3	CRV
Middlefield	4	95	8	180.8	CRV
Old Lyme	15	203	17	223.6	CRV
Portland	13	149	14	147.2	CRV
Westbrook	3	48	4	57.7	CTR
Andover	9	296	11	333	E
Ashford	11	268	8	185.3	E
Bolton	6	120	9	180.7	E
Bozrah	1	42	3	114.2	E
Brooklyn	5	70	9	109.6	E
Canterbury	11	234	13	253.3	E
Chaplin	9	400	18	780.9	E
Columbia	12	241	21	382.9	E
Eastford	2	124	5	285.9	E
Franklin	3	163	7	364.2	E
Hampton	12	683	11	590.4	E
Hebron	12	139	13	134.2	E
Lebanon	17	246	25	342.1	E
Lisbon	13	319	13	299.7	E
Marlborough	4	70	8	124.9	E
North Stonington	3	60	10	188.8	E
Pomfret	4	105	5	117.7	E
Preston	10	213	15	317.4	E
Putnam	4	44	6	62.6	E
Salem	6	156	10	240.9	E
Scotland	0	0	6	347.6	E
Sprague	12	404	6	201.1	E
Sterling	8	258	9	235	E
Thompson	6	68	4	42.3	E
Union	2	289	2	234.2	E
Voluntown	5	198	7	268.9	E
Willington	10	168	20	331.1	E
Woodstock	10	138	4	50.2	E
Barkhamsted	2	57	2	52.6	NW

Town	Cases 2010	Rate 2010	Cases 2013	Rate 2013	Zone
Bethlehem	4	117	7	194.1	NW
Bridgewater	4	219	1	57.9	NW
Burlington	3	37	6	64.5	NW
Canaan	3	278	2	162.1	NW
Colebrook	0	0	1	67.3	NW
Cornwall	1	70	3	211.3	NW
East Granby	2	42	6	116.6	NW
Goshen	1	37	2	67.2	NW
Hartland	1	50	5	236.5	NW
Harwinton	4	76	8	141.8	NW
Kent	2	70	4	134.3	NW
Litchfield	9	108	22	259.9	NW
Morris	4	174	6	251.3	NW
New Hartford	4	66	10	143.5	NW
Norfolk	1	60	2	117	NW
North Canaan	0	0	0	0	NW
Roxbury	0	0	5	221	NW
Salisbury	3	75	4	106.9	NW
Sharon	0	0	3	107.8	NW
Sherman	1	26	3	83.8	NW
Warren	0	0	2	136.9	NW
Washington	1	28	3	83.8	NW
Woodbury	9	98	17	170.4	NW
Bethany	5	99	9	161.8	SW
Easton	10	138	14	186.9	SW
Middlebury	5	78	12	158.4	SW
Redding	8	97	13	142	SW
Woodbridge	9	100	10	111.2	SW
Connecticut	90	3068	2918	81.6	

Source: Department of Public Health; Red indicates Towns with substantial increase since 2010