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At-Risk and Vulnerable Populations and Unmet Need

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CHAPTER 3. AT-RISK AND VULNERABLE POPULATIONS AND UNMET NEED

OVERVIEW

In addition to the projections of future acute care bed needs, this 2014 supplementary plan focuses on the issue of unmet health care need. It is important to understand that unmet health needs are disproportionately experienced among population sub-groups and geographic areas across Connecticut.

To align efforts and inform a data-driven planning process, the Connecticut Department of Public Health, in partnership with other state, local and regional entities, recently completed the *Healthy Connecticut 2020* State Health Assessment (SHA).⁶⁹ The SHA provides a detailed overview of the social, economic, physical well-being and mental health of our state's population. Guided by findings from the SHA, the partnership also developed the *Healthy Connecticut 2020* State Health Improvement Plan (SHIP)⁷⁰ to inform policy and program changes intended to improve the health of and health equity among Connecticut's residents. The SHIP includes recommendations for improving health care access and quality in an effort to achieve these objectives. Data and narrative in this section align with the *Healthy Connecticut 2020* reports and process.

This section provides a review of the health status, outcomes and unmet health care need of at-risk or vulnerable populations in Connecticut and attempts to identify communities most likely to have unmet health need in addition to those identified by hospitals in their community health needs assessments.

Persons At-Risk and Vulnerable Populations in Connecticut

While the state has an overall favorable health profile compared to the rest of the nation, the health of Connecticut's residents is not equally distributed across population groups or geographic regions. Barriers to the opportunities to live a healthy life may be disproportionately concentrated among certain populations, such as racial and ethnic minorities, low-income populations and the less educated. The influences of socioeconomic factors on health patterns and outcomes are often intertwined and demonstrably result in health disparities.

DPH's working definition of health disparities and priority populations among which they occur is: *"the differences in disease risk, incidence, prevalence, morbidity, mortality and other adverse conditions, such as unequal access to quality care that exist among specific population groups in Connecticut. Population groups may be based on race, ethnicity, age, gender, socioeconomic position, immigrant status, sexual minority status, language, disability, homelessness and geographic area of residence. Specifically, health disparities refer to those avoidable differences in health that result from cumulative social disadvantages."*⁷¹

At-risk or vulnerable populations include the elderly; residents with incomes below 200% of the federal poverty level; residents in urban core areas, defined as towns with the highest poverty and most dense population; racial or ethnic minorities such as Black non-Hispanics, Hispanics, American Indians, Asians and other non-White groups; residents of rural areas; persons who do not have insurance; homeless populations; non-English speakers; lesbian, gay, bisexual and transgender (LGBTQ) residents and immigrants.

Table 22 provides an estimate of Connecticut's at-risk or vulnerable residents and the percentage in poor health in 2012 (these population groups are not mutually exclusive). Overall, about 2.9% of the state's residents were estimated to be in poor health. In general, Connecticut's at-risk or vulnerable residents were more likely to be in poor health than other residents. For example, Connecticut residents with low-income

(4.5%) or elderly (5.1%), less than a high school education (9.9%) or disabled (15.4%) were much more likely to be in poor health than the overall population.

Table 22. Connecticut At-Risk or Vulnerable Populations by Health Status

Priority Population Group	Description of Connecticut Priority Population Group	Number of CT Population	% of CT Population	% of Priority Population in Poor Health ⁷
Total population ¹	Total Connecticut population	3,590,347	100.0%	2.9%
Elderly ¹	Population 65 years of age or older	532,024	14.8%	5.1%
Low income ²	Population with incomes below the federal poverty level	384,167	10.7%	4.5%
Less than college education ³	Population <25 years old with less than a college education	1,546,841	43.1%	5.8%
	Less than high school: 10.1%			9.9%
	Graduated high school/GED: 27.8%			4.3%
Some college: 25.0%	6.3%			
Unemployed	Population age 16 and older who are in the civilian labor force and are unemployed	189,561	6.6%	3.9%
Racial or ethnic minority ¹	Population of non-White racial or ethnic backgrounds	1,077,574	21.9%	4.3%
	Black or African American only: 9.4%			5.0%
	Asian only: 4.1%			2.9%
	American Indian only: <0.01%			N/A
	Other/2+ races: 2.0%			11.3%
Hispanic, any race: 14.2%	3.9%			
Immigrants ³	Immigrants: Population born outside of U.S.	495,421	13.8%	4.1%
	Non-English speaking: Population who speak a language other than English at home, among population 5+ years of age	755,297	22.2%	N/A
	Speak English less than "very well"	288,142	8.5%	N/A
Uninsured ²	Population under age 65 that is uninsured	321,972	9.0%	1.7%
	Children (<18 years old): 3.8%			1.9%
Adults (18-64 years old): 12.9%				
Homeless ⁴	Population spending the night in emergency shelter, a transitional housing facility, or an unsheltered situation	4,506		N/A
Persons with a disability (by age group) ⁵	Population with disability	376,618	10.7%	15.4%
	<5 years old: 0.7%			N/A
	5 to 17 years old: 5.0%			N/A
	18 to 64 years old: 8.2%			18.6%
65+ years old: 31.7%	12.9%			
Transportation ⁶	Population with no vehicle available among occupied housing units	123,561	9.1%	N/A

¹ U.S. Census Bureau, American Community Survey, 2012, 1-Year Estimates, DP05 File.

² U.S. Census Bureau, American Community Survey, 2012, 1-Year Estimates, DP03 File.

³ U.S. Census Bureau, American Community Survey, 2012, 1-Year Estimates, DP02 File.

⁴ Connecticut Coalition to End Homelessness, 2013 *Homeless Point in Time Count*, 2013.

⁵ U.S. Census, American Community Survey, 2012, 1-Year Estimates, S1810 File.

⁶ U.S. Census Bureau, American Community Survey, 2012, 1-Year Estimates, CP04 File.

⁷ U.S. Census Bureau, Current Population Survey, Annual Social & Economic Supplements, 2013

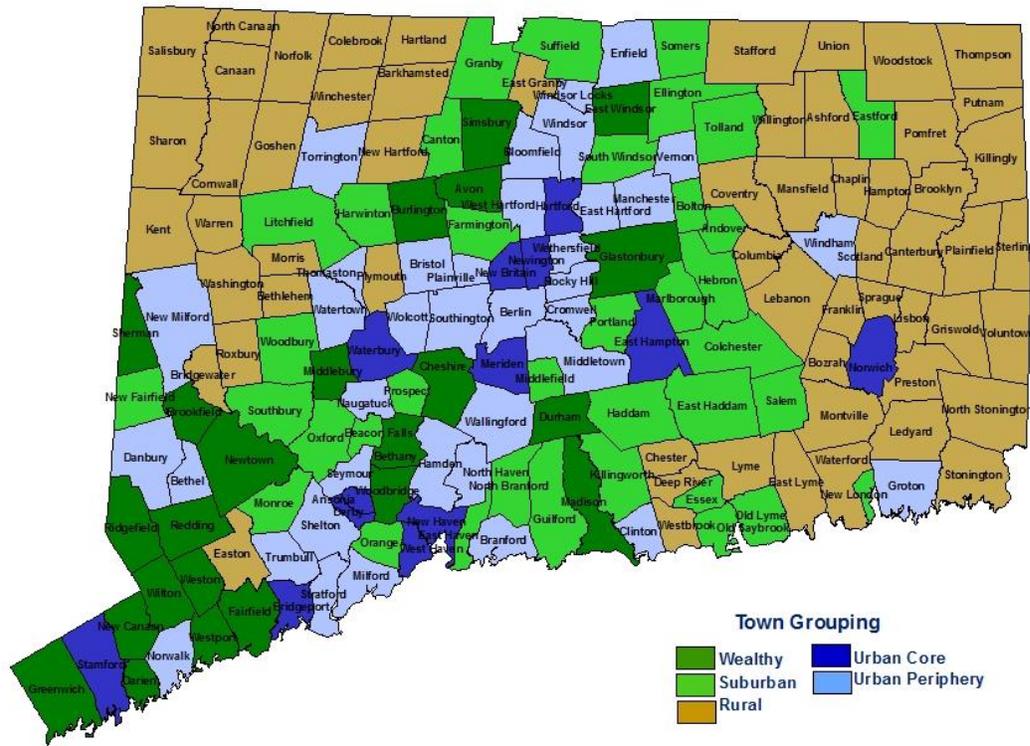
NOTE: N/A indicates data not available

Town Socioeconomic Grouping: the “Five Connecticut’s”

Disparities in health status, outcomes and unmet need also exist among communities in the state. Much work has already been done in Connecticut in examining the clustering of communities with similar socioeconomic characteristics in order to understand the wide variation in populations across the state. In 2009, the Connecticut State Data Center analyzed socioeconomic data for Connecticut’s 169 towns and organized them into five distinct groups based on three characteristics: population density, median family income and percent of population living below the federal poverty level. They found that this combination clearly and accurately described population distribution in Connecticut.

The distribution of the “Five Connecticut’s” across the state is shown in **Figure 9**. The classification categories range from “Wealthy” (exceptionally high income, low poverty and moderate population density) to “Urban Core” (lowest income, highest poverty and highest population density). In many cases, towns categorized in these extreme groups are found side-by-side or sandwiched between one another (e.g., Stamford between Greenwich and New Canaan or Waterbury between Middlebury and Cheshire).

Figure 9. Town Socioeconomic Grouping: the “Five Connecticuts,” 2009



Source: Connecticut State Data Center. The Changing Demographics of Connecticut: the Five Connecticuts. Recreated graph from updated 2009 data provided through personal communication.

Numerous studies establish the strong relationship among socioeconomic status, geographic location, health outcomes, access to health care services and unmet health care need. The unmet need discussion that follows builds off of this previous work in understanding how a greater expanse of socioeconomic characteristics is distributed across Connecticut and the effect on health outcomes.

Unmet Health Care Need Definition

As in the 2012 Connecticut Health Care Facilities and Services Plan, unmet health care need is defined using a two-pronged definition.

First, unmet need is defined as the inadequate availability of health care services deemed necessary to address a particular health problem.^{72, 73} Using this definition, the barriers to accessing care may be one or more of the following:

- Physical unavailability of service or professional shortage;
- Mismatched services for the needs of the people -- that is, the health care system is unresponsive;
- Inferior available services as compared to the norm;

- Lack of knowledge regarding what services are available locally or how to access them;
- Lack of enabling services such as translation services to non-English speaking immigrants or transportation to facilitate access, especially in rural areas;
- Insufficient coordination between different providers of different levels and types of services;
- Complex health insurance payer rules such as eligibility for Medicare and/or Medicaid and for accessing services; and
- Inadequate collaboration among governmental agencies and/or community providers.

Second, unmet need is defined as when individuals of a distinct socio-demographic group, such as the uninsured or people with low income, forego or delay accessing needed available health care services because the associated costs are unaffordable. The Institute of Medicine (IOM) has identified lack of insurance as a significant driver of health disparities.⁷⁴

These definitions of unmet health need aim to take into account the complexity of factors that have an adverse impact on health status as a result of limited or disproportionate access to care. Whichever definition is used, unmet need has to be quantified to determine the appropriate intervention(s) or policy change(s). The expected result is a more integrated health care delivery system in which resources are allocated efficiently based on agreed priorities to improve health status and eliminate inequalities.

UNMET NEED COMPOSITE INDEX METHODOLOGY

To assess unmet need in Connecticut, three indices were created. The Socioeconomic Status (SES) index comprises measures that are important determinants of health; the Health Outcomes (Outcomes) Index includes indicators that are proxies for a community's health and its overall health system; and the Unmet Need Index, which is a combination of the SES and Outcomes indices. These indices were developed using town-level U.S. Census Bureau sociodemographic and DPH hospitalizations and mortality data. Multi-year data for the most recent periods available were used for more reliable and precise estimates, particularly for smaller towns.

Using a simplified hybrid of the Oregon⁷⁵ and the Middling⁷⁶ approaches, these indices were created using several steps:

- For each measure or indicator within an index, divide the town or city prevalence rate by the rate for the state;
- Sum the results for the group of measures or indicators to obtain the index for the town or city;
- Each indicator for the state is assigned a value of 1, so the Connecticut index value is the number of indicators included in the index;
- Compare the index for the town or city to the Connecticut index value;
- An index value for a town or city below, equal, or above the Connecticut index value implies that the health or health care profile of the town or city is better than, equal to, or worse than the profile for the state. An index higher than the state's indicates the town or city has a higher probability of unmet health care need. A lower value implies the town or city has a better profile than the state and is less likely to have unmet need.

Socioeconomic Status (SES) Index

The SES index consists of social, demographic and economic factors established in the literature as having a significant impact on population health. This index includes U.S. Census five-year average (2008 to 2012) estimates of the following measures:

- Poverty status: percent of the population below the federal poverty level
- Educational attainment: percent of the population age 25 and older with less than a high school education or without a high school diploma
- Employment status: percent of the population age 16 and older that is unemployed
- Transportation: percent of the population age 16 or older that do not own a car
- Language proficiency: percent of the population that speaks English “less than very well”
- Health insurance status: percent of the population aged 18 to 64 that is uninsured
- Disability status: percent of the population that is disabled
- Age: percent of the population that is age 65 or older
- Racial or ethnic minority status: percent of the population that is non-white, non-Hispanic
- Medicaid coverage: percent of the population with Medicaid coverage

These indicators were selected for the SES index because they have all been found to have a significant association with health. For example, both lower education and lower income levels are highly correlated with poorer health outcomes; education may influence health outcomes through noneconomic pathways such as health-related knowledge, literacy and problem-solving skills.⁷⁷ Income may affect health through access to economic resources.⁷⁸ Additionally, evidence indicates that poverty is associated with adverse health outcomes.⁷⁹ Conversely, employment is associated with more favorable health outcomes,⁸⁰ since it provides income, benefits such as health insurance and other programs that are conducive to health, access to health care and economic stability.

Racial and ethnic minorities experience higher rates of morbidity and mortality compared to White non-Hispanics. For example, *Healthy Connecticut 2020* noted that Black non-Hispanic residents have greater morbidity, premature mortality and hospitalizations relative to White non-Hispanic residents.⁸¹ While Hispanics may appear to have favorable or similar health patterns relative to White non-Hispanics, evidence indicates that adjusting for socioeconomic status un masks health disparities among Hispanics.⁸²

Persons without health insurance coverage experience barriers to receiving needed medical care are more likely to have poor health and experience premature mortality than persons with health insurance.⁸³ Medicaid is an important safety net program that provides health care access to the most economically vulnerable. Relative to the general population, Medicaid participants tend to have lower income and less education,⁸⁴ factors that are associated with worse health outcomes and limited health care access. Medicaid recipients are also known to experience difficulties in accessing specialty health care services.⁸⁵

The population of older adults is the fastest growing age group in the U.S. and this population experiences increased risk of chronic conditions, dementia and related hospitalizations.⁸⁶ In Connecticut, the population of adults age 65 years and older is expected to increase by 64% by 2030.⁸⁷

Persons with limited English language proficiency may experience challenges when communicating with health care providers. Ensuring the availability of translation services and health care materials in the language of persons with limited English language proficiency is critical for reducing disparities in health care, quality of care, medical errors and access.^{88, 89}

Disability, which may affect persons across the life span, is associated with greater risk for unemployment, physical inactivity, tobacco use, overweight and obesity, chronic disease, distress and barriers to health care.⁹⁰

Residents of rural communities may encounter unique barriers to accessing health care, as identified in the Connecticut Rural Health Report.⁹¹ For example, accessing primary and specialty health care services that are a distance from rural communities may be a significant challenge, particularly for persons with limited access to transportation. Consequently, such residents may delay accessing care until their conditions become acute.

Given that there are ten indicators in the SES index, each assigned a value of 1 for the state, the Connecticut index summed to a value of 10. A value greater than 10 implies that the health or health care profile of the town or city is worse than the profile for the state and therefore has a higher probability of an unmet health care need. A value that is lower than the overall value for Connecticut implies that the town or city has a better profile than the state and is less likely to have an unmet health care need.

Health Outcomes Index

The health outcomes index is a measure of the community's health and includes five indicators of population health and access to health care services:

- Infant mortality rate: rate of infant deaths within the first year per 1,000 live births (2007-2009)
- Crude mortality rate per 100,000 population (2006-2010)
- Hospitalization rate for ambulatory care sensitive conditions per 100,000 population (2010-2012)
- Avoidable emergency department use rate per 100,000 populations (2011-2013)
- All-cause 30-day readmissions rate per 100 discharges (2011-2013)

These key measures are routinely used to indicate the health of a community and may represent differential access to prevention and treatment. The infant mortality and crude death rates provide a profile of health over the lifespan. The infant mortality rate is a measure of child survival and social, economic and environmental conditions in which children live. The crude death rate is influenced by the age distribution of specific populations because it reflects characteristics of the town or city, such as the age of the population. Avoidable hospitalizations, ED use and readmission rates may be used to assess the overall health care delivery system. Avoidable hospitalizations or ED use may also represent instances of hospital care for chronic and acute health conditions more appropriately treated or managed in a less expensive outpatient setting. Some readmissions are preventable and are symptomatic of a fragmented health care system, such as poor coordination of care between hospitals and community health providers, limited community-based care and insufficient hospital discharge planning.⁹²

The five indicators comprise the health outcomes index and each indicator is assigned a value of 1 at the state-level, therefore the Connecticut health outcomes index summed to 5. A value greater than 5 implies that the health or health care profile of the town or city is worse than the profile for the state and therefore has a higher probability of an unmet health care need. A value that is lower than the overall value for Connecticut implies that the town or city has a better profile than the state and is less likely to have an unmet health care need.

Unmet Need Composite Index

The unmet need composite index is the sum of the SES and health outcomes indices and is an indicator of which towns or cities may have an unmet health care need. These assessments are not measures of exact need. The state-level index has a value of 15, which is the sum of the health status index (10) and the health care services access index (5). Thus, a value greater than 15 implies that the health or health care profile of the town or city is worse than the profile for the state and therefore has a higher probability of an unmet health care need. A value that is lower than 15 implies that the town or city has a better profile than the state and is less likely to have an unmet health care need.

Socioeconomic Factors, Health Outcomes and Unmet Need

This section discusses the factors included in the indices in more detail and presents the findings on unmet need in communities around the state.

There are a number of social and economic factors that influence health. Too many people experience substantial barriers to opportunity to be healthy and engaged in health-promoting behaviors. Examples of barriers facing individuals and families include living in unsafe neighborhoods and communities or having limited access to nutritious, affordable food or safe places to exercise; or experiencing violent relationships at home, in their neighborhoods or at school.⁹³ Marginalized populations, such as racial and ethnic minorities, homeless persons, persons with disabilities and the LGBTQ community, among others, may disproportionately experience these barriers to the opportunity to live a healthy life. Understanding factors that contribute to different health patterns for these populations can facilitate identification of data-driven and evidence-based strategies to promote well-being.

Health Status: Chronic Conditions

An issue exacerbating the differential access to health care services is that at-risk and vulnerable populations generally have a greater prevalence of chronic diseases than the overall population. **Table 23** provides an overview of selected leading chronic conditions and reasons why Connecticut residents seek health care. Prevalence and incidence of these conditions vary among population groups.

Table 23. Selected Leading Causes of Morbidity and Mortality, Connecticut

Health Condition	Incidence per 100,000/% Share
Cancer (Incidence) ¹	491.8 cases per 100,000 population
Heart Disease (Hospitalizations) ²	875.2 cases per 100,000 population
Stroke (Hospitalizations) ²	219.7 cases per 100,000 population
High cholesterol ³	36.2%
Hypertension ³	29.8%
Depressive disorder ⁴	16.7%
Asthma ⁴	
Children (<18 yrs)	18.7%
Adults (18+ yrs)	14.3%
Diabetes ⁴	9.1%

¹ Connecticut Tumor Registry, Connecticut Department of Public Health, 2008-2010.

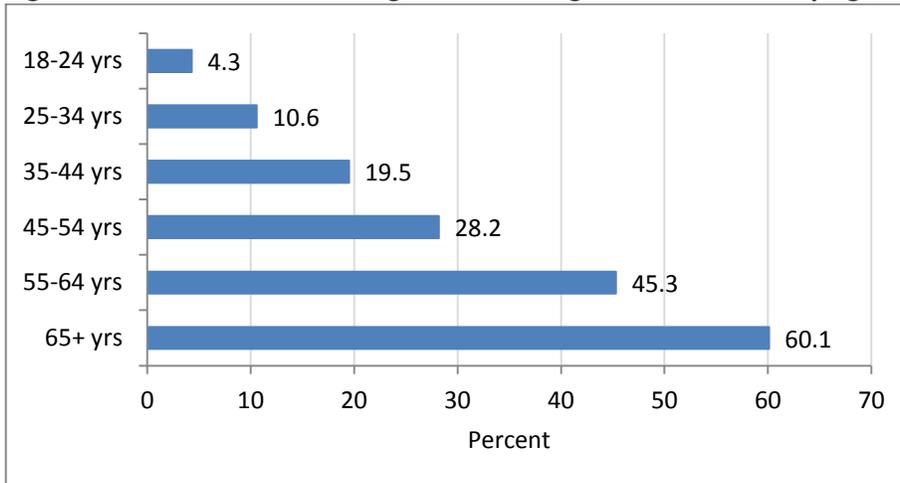
² Connecticut Department of Public Health, Hospitalization Tables, 2011, Table H-1.

³ Connecticut Department of Public Health, Connecticut Behavioral Risk Factor Surveillance System, 2011.

⁴ Connecticut Department of Public Health, Connecticut Behavioral Risk Factor Surveillance System, 2012.

For example, prevalence of high blood pressure and diabetes are patterned by age, race and ethnicity, education and income. In 2011, the prevalence of diagnosed high blood pressure among adults increased with age, varying from 4.3% among persons 18 to 24 years of age, to 60.1% for persons 65 years of age and older (**Figure 10**). These patterns reflect national trends in the increased risk of chronic conditions for older adults, the fastest growing age group in the U.S. and Connecticut.⁹⁴

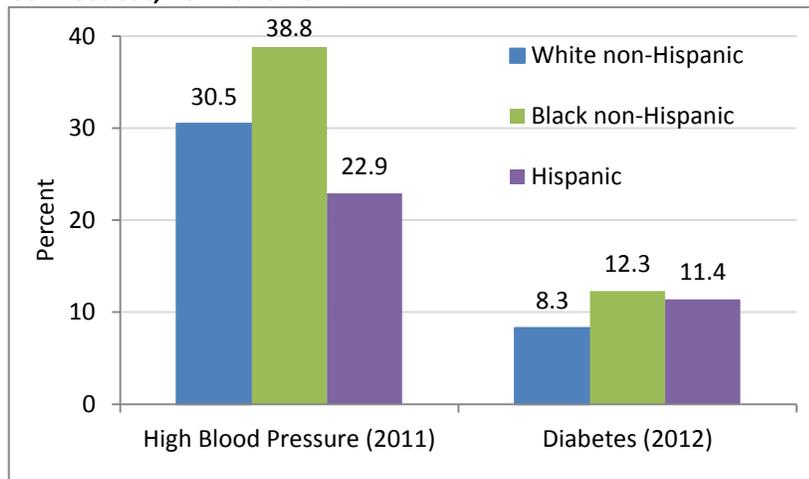
Figure 10. Percent of Adults Diagnosed with High Blood Pressure by Age, Connecticut, 2011



Source: Connecticut Behavioral Risk Factor Surveillance System, 2011, CDC.

Consistent with findings from the *Healthy Connecticut 2020* State Health Assessment, the prevalence of diagnosed high blood pressure and diabetes also varied by race and ethnicity (**Figure 11**). The rates ranged from a low of 22.9% for Hispanics, to a high of 38.8% for Black non-Hispanics for high blood pressure and 8.3% for White non-Hispanics to 12.3% for Hispanics for diabetes. Small sample sizes preclude an examination of the patterning of these chronic conditions by socioeconomic status for each of these racial or ethnic groups. However, evidence suggests that racial and ethnic disparities in health may be partially, but not fully, explained by socioeconomic inequalities concentrated among non-White racial and ethnic groups.⁹⁵

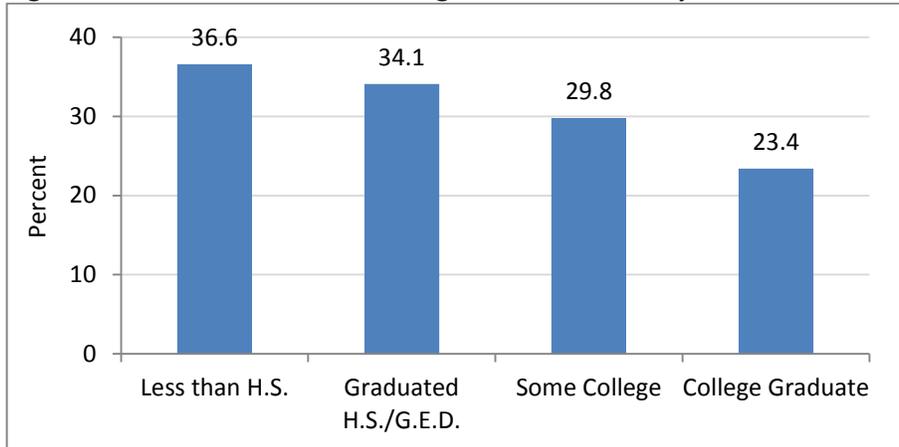
Figure 11. Percent of Adults Diagnosed with High Blood Pressure or Diabetes by Race and Ethnicity, Connecticut, 2011 and 2012



Source: Connecticut Department of Public Health, Behavioral Risk Factor Surveillance System, 2011 (high blood pressure) and 2012 (diabetes).

Evidence links lower levels of education and income with adverse health outcomes.⁹⁶ There is an inverse relationship between certain health conditions and education and income level. In 2011, the proportion of Connecticut adults diagnosed with high blood pressure was significantly lower among those with a college degree (23.4%) than among adults with less than a college education (**Figure 12**).

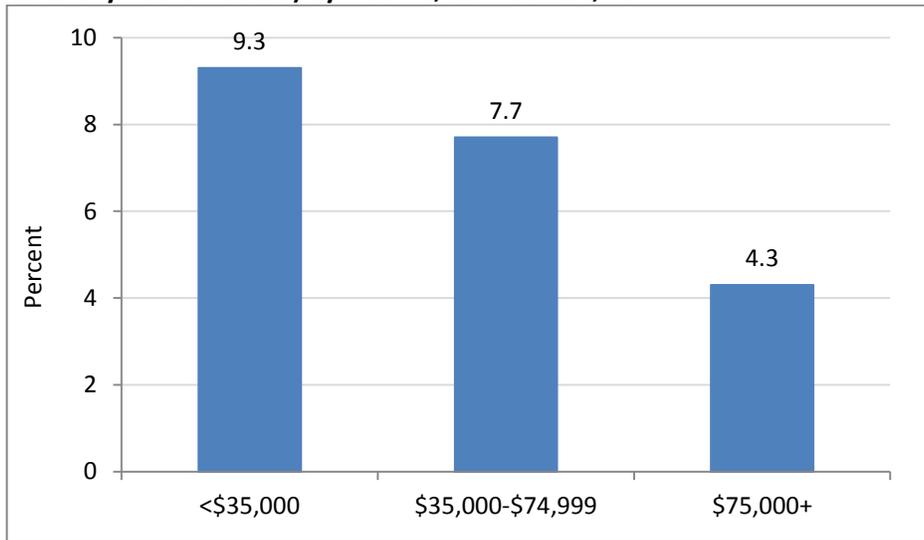
Figure 12. Percent of Adults with High Blood Pressure by Educational Attainment, Connecticut, 2011



Source: Connecticut Department of Public Health, Behavioral Risk Factor Surveillance System, 2011.

As shown in **Figure 13**, a greater proportion of adults with lower household income have at least one heart disease experience (heart attack, stroke or coronary heart disease) relative to adults with higher household income.

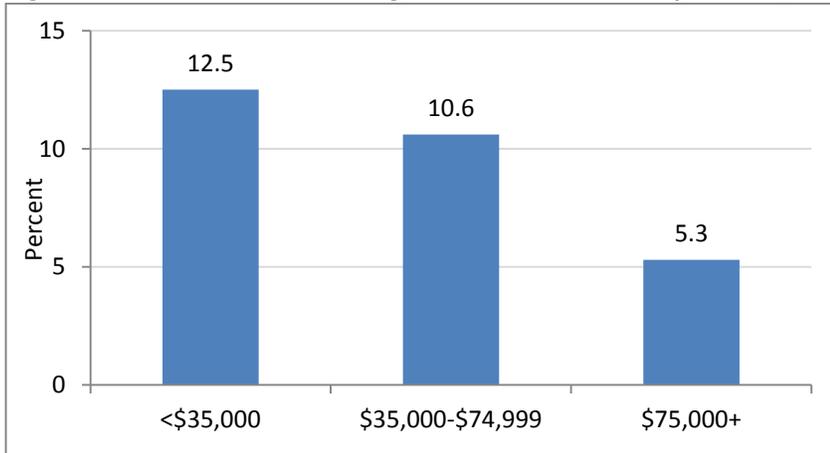
Figure 13. Percent of Adults Who Have at Least One Heart Disease Experience (Heart Attack, Stroke, Coronary Heart Disease) by Income, Connecticut, 2012



Source: Connecticut Department of Public Health, Behavioral Risk Factor Surveillance System, 2012.

Prevalence of diabetes among adults in Connecticut in 2012 differed by income (**Figure 14**). A significantly greater percent of adults with incomes less than \$35,000 (12.5%) were diagnosed with diabetes as compared to those with incomes of \$75,000 or more (5.3%). These patterns are similar for many conditions and risk behaviors.

Figure 14. Percent of Adults Diagnosed with Diabetes by Income, Connecticut, 2012

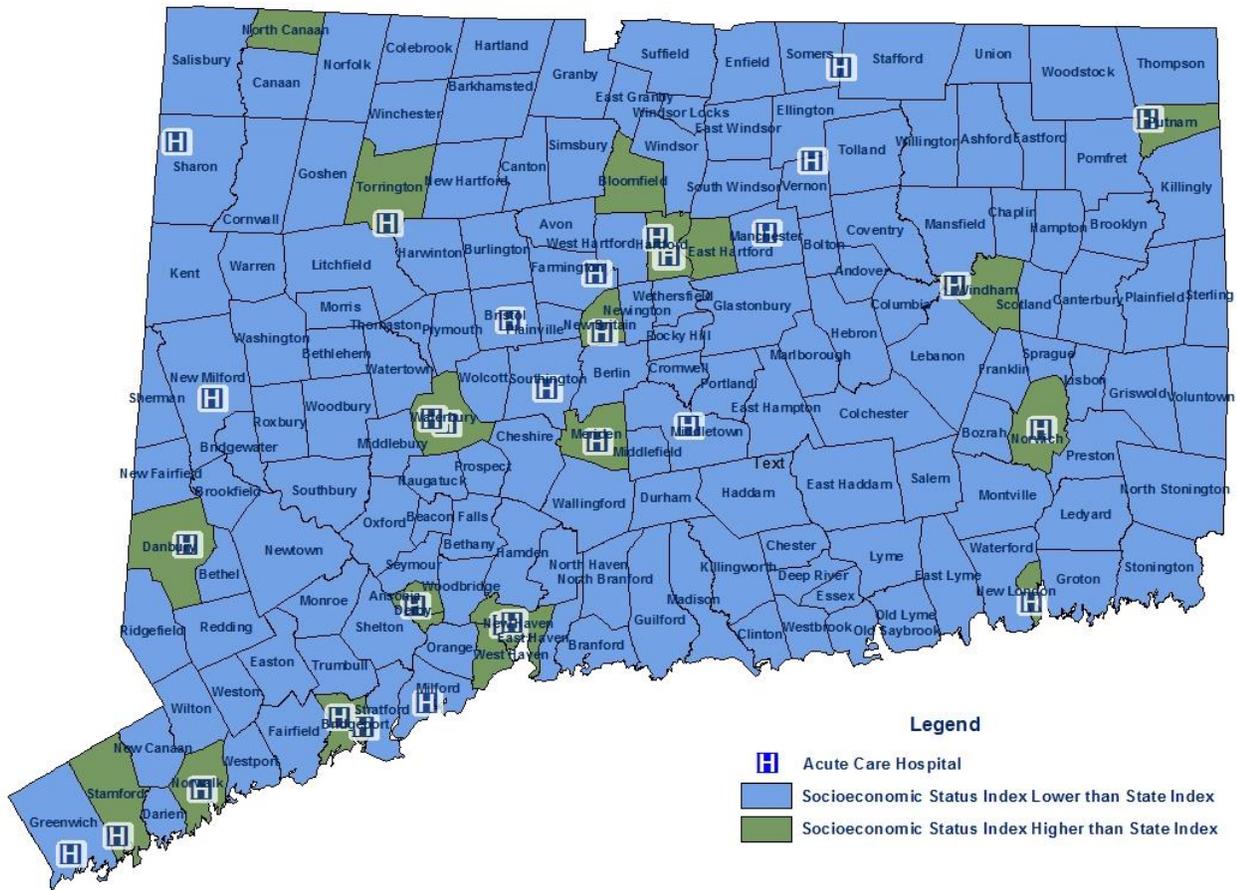


Source: Connecticut Department of Public Health, Behavioral Risk Factor Surveillance System, 2012.

Distribution of Socioeconomic Status Index among Towns and Cities

The SES index is an indication of towns with the propensity to have poor health status and thus increased predisposition to having unmet health care need. The SES index for most towns and cities was lower than the state except for 20 communities, shaded in green on the map on the following page (**Figure 15**). The 20 communities are represented by 13 large towns and cities (e.g., Hartford and Bridgeport); 5 urban periphery towns (e.g., Danbury and Windham) and 2 rural towns (e.g., North Canaan and Putnam). Residents in these towns had a higher proportion of unfavorable socioeconomic conditions making them more likely to have unmet need and poorer health. While only these 20 towns and cities, as a whole, had a greater disproportionate share of vulnerable populations, several other towns and cities had at least one of their vulnerable subpopulations with an index above the state's and therefore remain at risk for an unmet health care need.

Figure 15. Socioeconomic Status Index, by Town



Source: US Census Bureau's American Community Survey 5-year Estimates.
DPH, OHCA, December 2014

HEALTH OUTCOMES OF CONNECTICUT’S AT-RISK OR VULNERABLE POPULATIONS

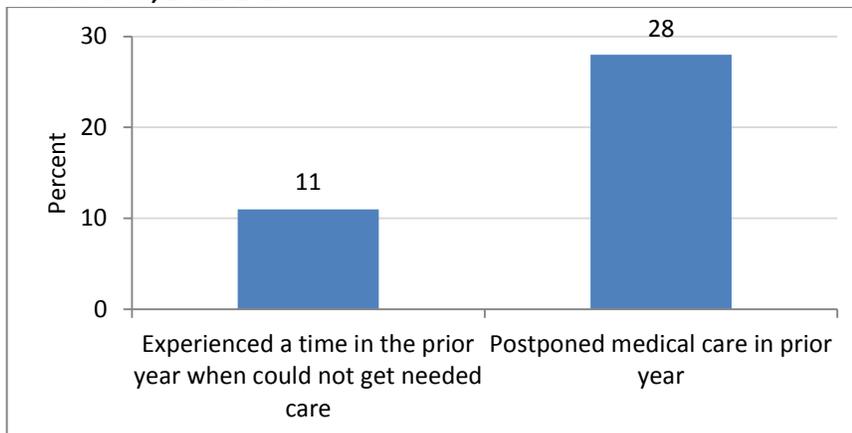
In addition to SES characteristics of a population, another significant reason for differences in health status and outcomes in the state is the differential access to health care services for prevention and treatment. The following presents a portrait of at-risk and vulnerable populations’ challenges in accessing the health care system.

Health Care Access and Utilization Among At-Risk and Vulnerable Populations

Health Care Access

As discussed in *Healthy Connecticut 2020* state health assessment and improvement plan, health care access continues to be a challenge for many Connecticut residents. **Figure 16** shows that as many as 11% of adults could not get needed health care at a point in time and 28% postponed medical care in the past year. The proportion of adults citing unmet medical needs was lower among adults who were 65 years of age or older relative to younger age groups.⁹⁷ Among adults who reported unmet medical needs, 59% identified cost as the main barrier.⁹⁸

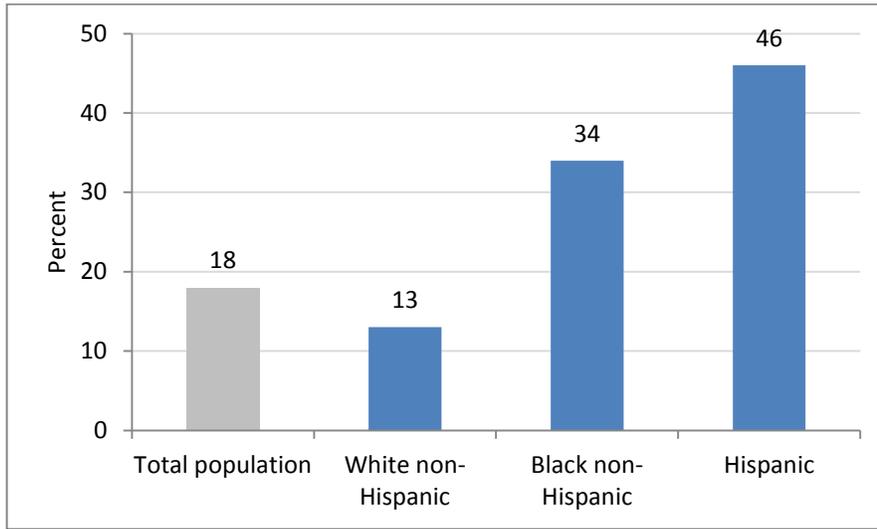
Figure 16. Percent of Adults Who Did Not Get Needed Medical Care or Postponed Medical Care in Prior Year, Connecticut, 2012-2013



Source: University of Massachusetts Medical School. Connecticut Health Care Survey: Executive Summary. 2014. Office of Survey Research, Center for Health Policy and Research, University of Massachusetts Medical School.

Overall, eighty-six percent (86%) of adults in Connecticut reported having a usual source of health care. Of those respondents with a usual source, approximately eight out of ten reported the source as a doctor’s office and nearly two out of ten listed a clinic or health center. When examining patterns by race and ethnicity (**Figure 17**), Black non-Hispanic (34%) and Hispanic (46%) residents were far more likely to use a clinic or health care center as their usual source of care, compared to White non-Hispanic residents (13%).

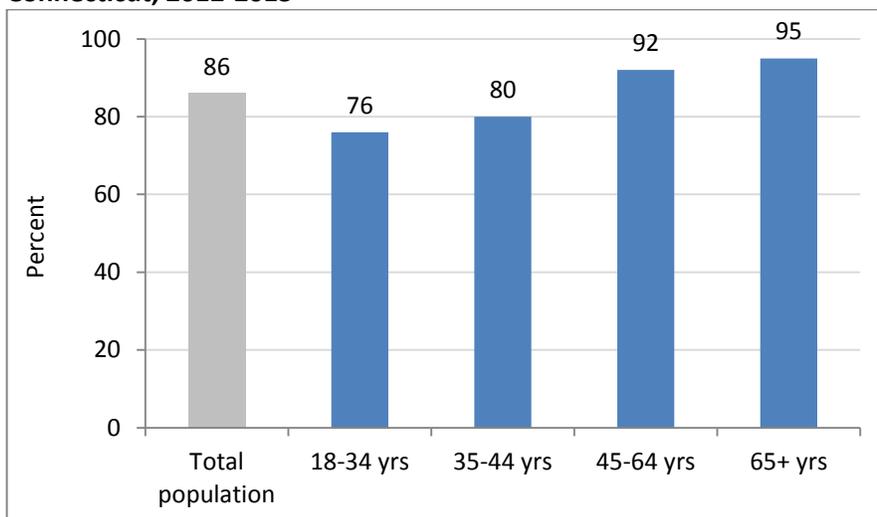
Figure 17. Percent of Adults with a Usual Source of Care Who Identified a Clinic or Health Center as Their Usual Source of Care, Connecticut, 2012-2013



Source: University of Massachusetts Medical School. Connecticut Health Care Survey: Executive Summary. 2014. Office of Survey Research, Center for Health Policy and Research, University of Massachusetts Medical School.

Among adults with a usual source of care, 86% reported always seeing the same provider (**Figure 18**). However, these patterns varied by age, with a smaller proportion of younger adults reporting that they always had been treated by the same provider as compared to older adults. The proportion of adults that always were treated by the same provider increased by age cohort, that is, from 76% of persons 18-34 years of age to 95% of persons 65 years of age or older. Studies show that continuity of care improves the quality of care, reduces emergency room visits by nearly half and results in shorter hospital stays.⁹⁹

Figure 18. Percent of Adults with a Usual Source of Care Who Report Always Seeing the Same Provider, Connecticut, 2012-2013



Source: University of Massachusetts Medical School. Connecticut Health Care Survey: Executive Summary. 2014. Office of Survey Research, Center for Health Policy and Research, University of Massachusetts Medical School.

Lack of access to a usual source of care and care coordination has been determined to lead to avoidable emergency department use, hospitalizations and readmissions. The rates of occurrence in a community are an indicator of the quality of its primary health care system and transitions between care settings. At-risk persons are disproportionately represented among Connecticut residents whose hospitalizations or ED visits may have been avoided with timely and effective primary care. Connecticut residents 65 years and older are about 14% of the populations but account for 58% of preventable hospitalizations and 46% of readmissions (**Table 24**). Black non-Hispanics and Hispanics were more likely than White non-Hispanics to have a potentially preventable hospitalization, avoidable ED visit or to visit the ED more than ten times within a year. Connecticut communities with relatively higher concentrations of White non-Hispanic adults ages 65 years and older, Black non-Hispanics, Hispanics, residents suffering from a chronic condition or in proximity of an acute care hospital were at greater risk for such hospitalizations or ED visits.

Table 24: Acute Care Preventable Hospitalizations, Readmissions and ED Use, Connecticut, 2010-2013

Characteristics	Preventable Hospitalizations CY 2010-2012 ¹	Readmissions within 30 Days of Discharge FY 2011-2013 ²	Avoidable ED Use CY 2010-2013 ³	ED Frequent Users FY 2011-2013 ⁴
Hospitalizations/visits	44,420	54,292	706,031	68,986
% of all	11	13	44	5
Patient Days	220,199	324,429	n/a	n/a
% of all	11	16		n/a
Total Charges	\$1,273,249,189	\$2,192,607,773	n/a	\$121,229,580
% of all	10	15		5
Age in years (%)				
<18	9	6	20	3
18 – 44	10	20	46	55
45 – 64	23	29	23	37
65+	58	46	11	5
Race/Ethnicity (per 100,000)				
CT	1,239	1,515	21,507	1,925
White, non-Hispanic	1,280	1,574	14,490	1,369
Black, Non-Hispanic	1,763	2,114	37,240	3,612
Hispanic	923	1,027	35,972	3,192
Other	42	62	45,262	176
Primary Payer (%)				
Medicare	63	53	16	21
Medicaid	17	22	45	64
Private	18	23	29	7
Uninsured	2	2	10	6
UConn Five Town Grouping (%)				
Urban core	36	36	48	59
Urban periphery	38	37	31	30
Rural	8	8	8	5
Suburban	10	11	7	3
Wealthy	9	8	5	3

Source: CT DPH Office of Health Care Access Acute Care Hospital Discharge Database, Connecticut Hospital Association's ChimeData and U.S. Census Bureau 2010-2012 American Community Survey 3-year estimates, Table DP05.

¹ Instances of inpatient care for health conditions or illness typically treated or managed in an outpatient setting. Instances determined with Agency for Healthcare Research and Quality WinQI 4.5 tool.

² Scheduled and unscheduled readmissions to the same hospital

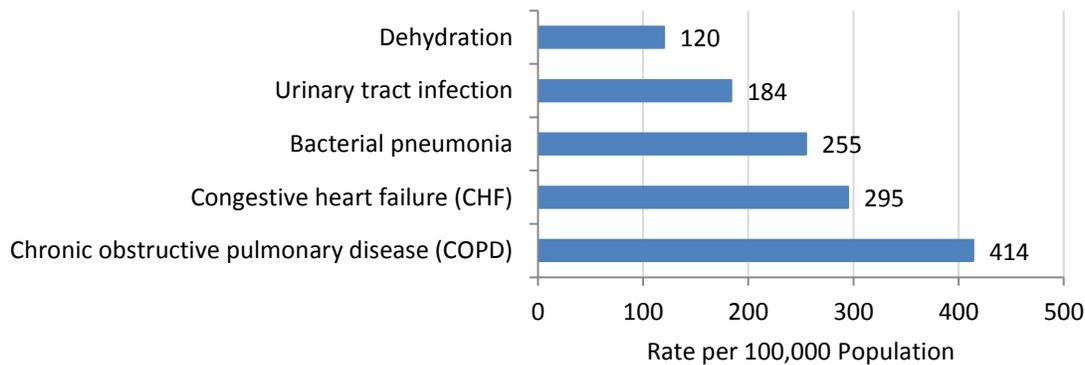
³ ED non-admit visits that may have been avoided. New York University algorithm applied.

⁴ ED non-admits with ten or more ED visits per year.

There is increasing concern about patients who utilize a disproportionate share of emergency department services, otherwise called “super users.”¹⁰⁰ The identification of characteristics of super users can inform interventions to improve preventive or specialty care or to enhance the integration of care among these populations and thus to reduce inappropriate utilization of acute care services and health care expenditures.¹⁰¹ For example, the Camden, New Jersey emergency department utilization study showed that a relatively small proportion of the patient population (13%) was generating the majority (80%) of the total cost associated with treating 98,000 patients over 7 years. Approximately 95% of the population was determined to be Medicaid-eligible.¹⁰² Other studies have examined the specific health conditions or other risk factors that are common among super users. One study identified alcohol-related diagnoses as the leading cause of ED use. Mental health and drug-related diagnoses were also common among ED super users.¹⁰³

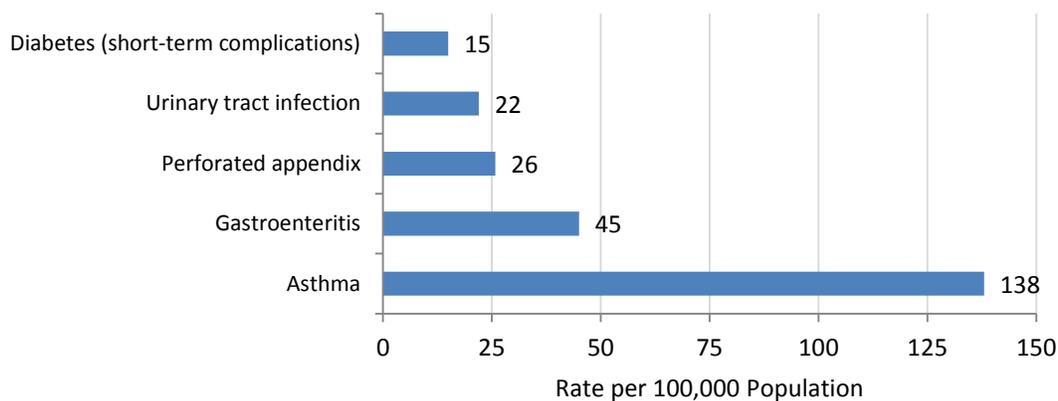
The leading causes of preventable hospitalization among Connecticut adults (**Figure 19**) and children (**Figure 20**) were chronic conditions; 414 per 100,000 adult population were hospitalized for chronic obstructive pulmonary disease (COPD) and 138 per 100,000 of child population were hospitalized for asthma in 2012.

Figure 19. Leading Causes of Preventable Hospitalizations among Adults, Connecticut, 2012



Source: CT DPH Office of Health Care Access, 2014 Preventable Hospitalizations Report

Figure 20. Leading Causes of Preventable Hospitalizations among Children, Connecticut, 2012



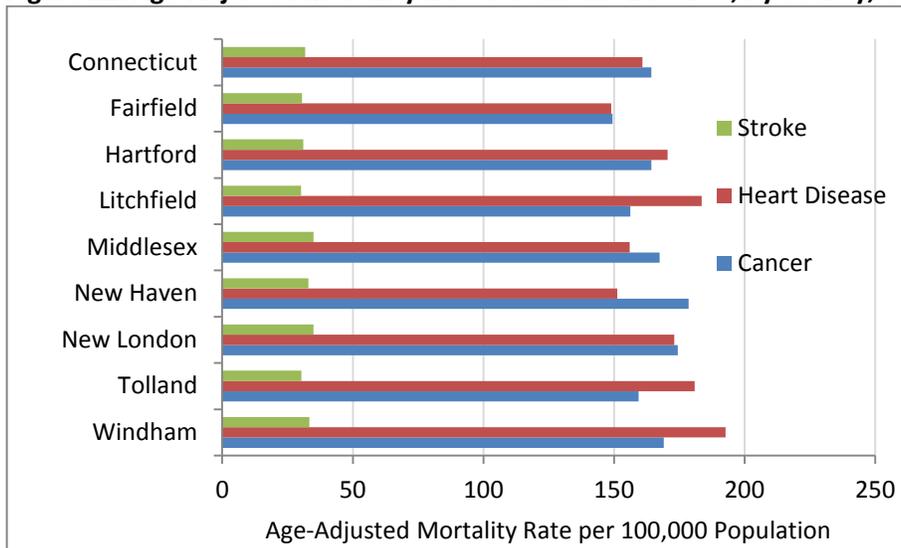
Source: CT DPH Office of Health Care Access, 2014 Preventable Hospitalizations Report

Literature shows that hospital readmissions are over-concentrated among Medicare and Medicaid beneficiaries and uninsured patients, and that the leading causes of readmissions vary by payer type. In 2010, the leading causes of hospital readmissions among Medicare beneficiaries included complications for congestive heart failure, septicemia, pneumonia, COPD and bronchiectasis, cardiac dysrhythmias and urinary tract infections. For Medicaid beneficiaries, the leading causes of hospital readmissions were for mood disorders, schizophrenia and other psychotic disorders, diabetes, pregnancy complications, alcohol-related disorders and early or threatened labor. Leading causes of hospital readmissions among uninsured patients include mood disorders, alcohol-related disorders, diabetes, pancreatic disorders, skin and subcutaneous tissue infections and chest pain. Among patients with private insurance, maintenance chemotherapy or radiotherapy, mood disorders, surgical complications or complications of medical care, complications of devices, implants, or grafts, septicemia and diabetes were the leading reasons for hospital readmission.¹⁰⁴

Mortality

Since disease incidence and health status are socially patterned, it is important to consider the wide socio-demographic variation across Connecticut in examining mortality data. **Figure 21** shows the age-adjusted mortality rate (AAMR) for each county for three chronic conditions, heart disease, cancer and stroke, which are also the leading causes of illness and mortality in the state. The age-adjusted mortality rate for cancer was highest in New Haven and New London counties; Windham and Litchfield counties had the leading heart disease mortality rate; Middlesex and New London counties had the highest stroke mortality rate.

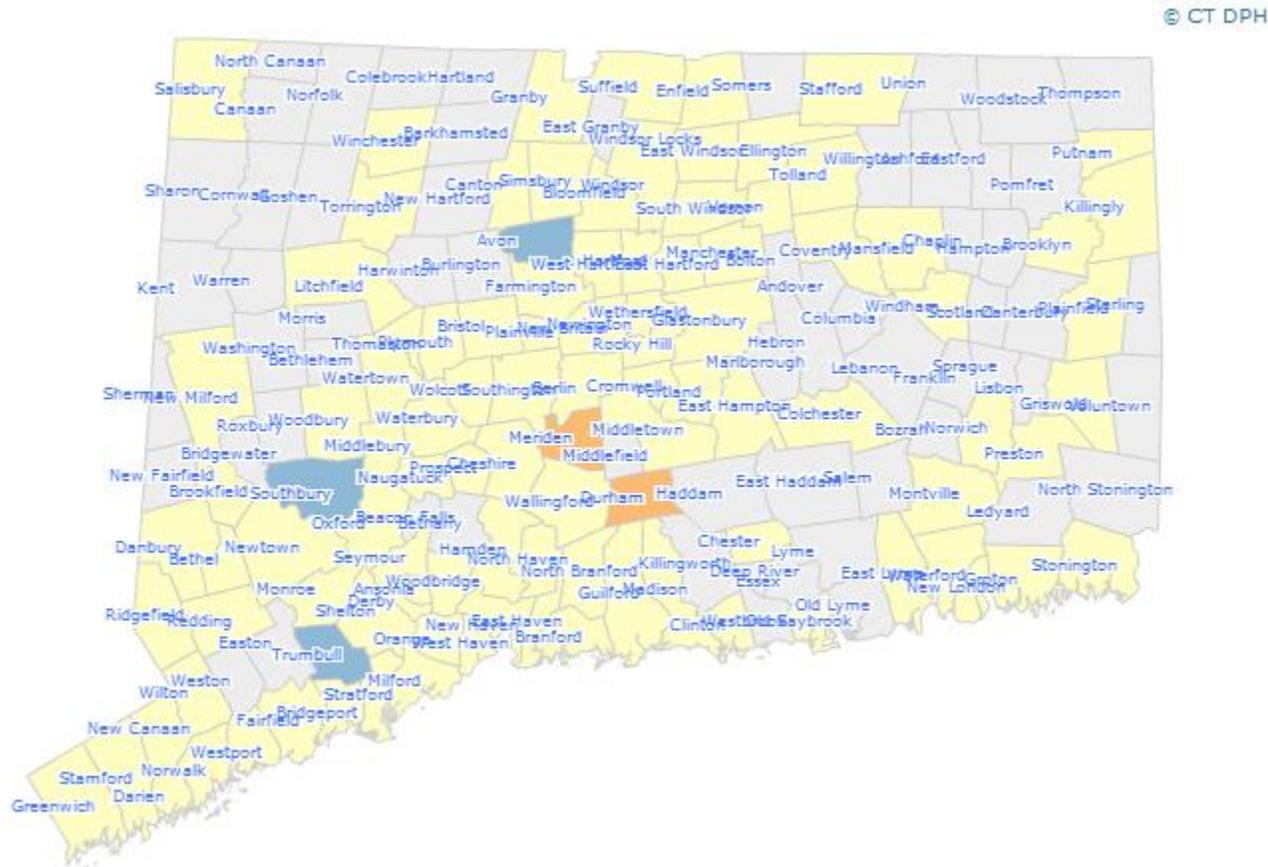
Figure 21. Age-Adjusted Mortality Rate for Chronic Diseases, by County, Connecticut, 2006-2010



Source: Connecticut Department of Public Health, 2006-2010.

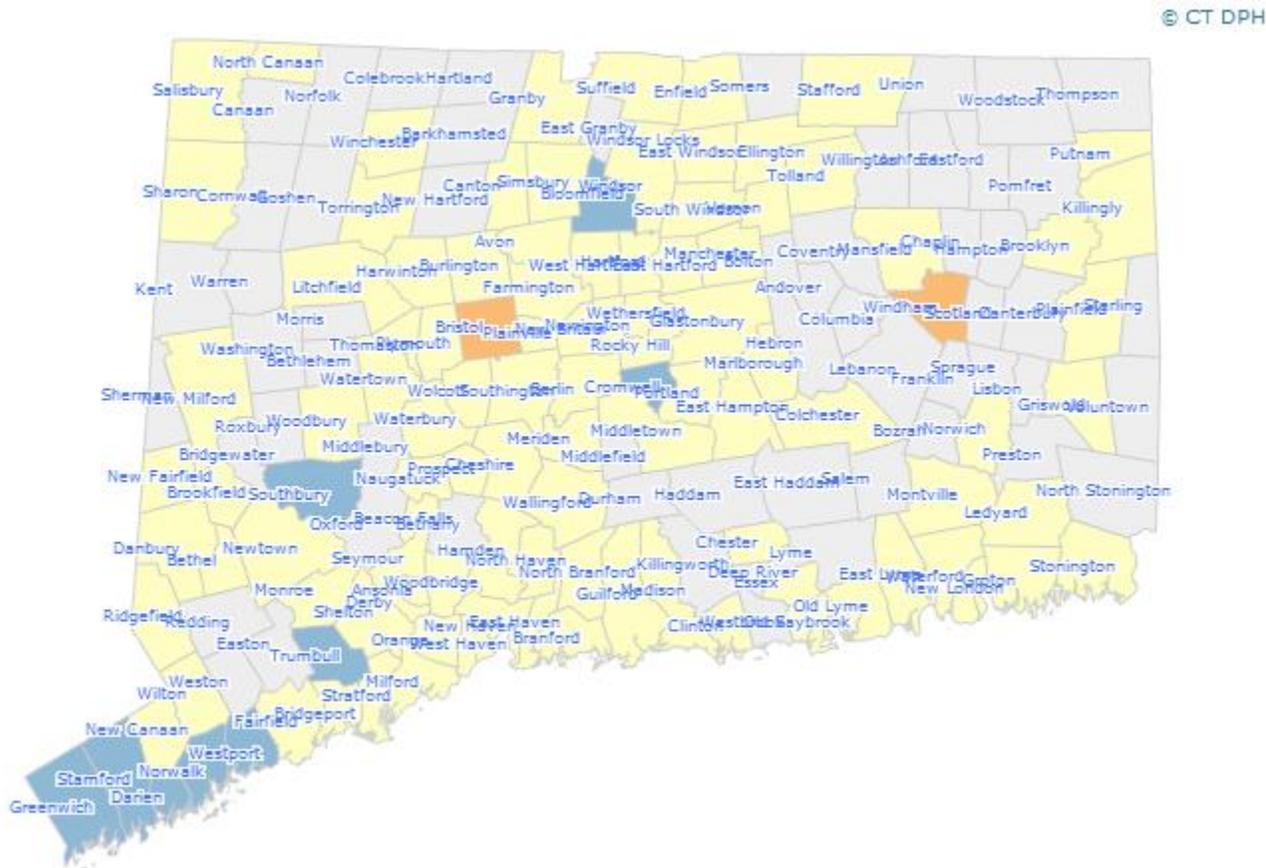
The variation in outcomes among counties also occurs among smaller geographic areas and population groups. For example, **Figure 22** shows that the AAMR for heart disease exceeded the state average in towns in northern Connecticut that are predominantly rural or suburban and several towns in central Connecticut that may be urban, suburban, or rural. Also, in **Figure 23**, the AAMR for cancer exceeded the state average in Stonington, a rural town and several urban core towns, including East Hartford, New Haven and West Haven. As presented in **Figure 24**, the AAMR for stroke exceeded the state average in wealthy Durham and urban core Meriden. The urban periphery towns of Bristol and Windham had chronic lower respiratory disease AAMRs that were greater than the state average (**Figure 25**).

Figure 24. Age-Adjusted Mortality Due to Stroke, by Town, Connecticut, 2006-2010



Source: Connecticut Department of Public Health, Instant Atlas, 2006-2010.
 Note: Orange indicates mortality rates that exceed the State average;
 Blue indicates mortality rates below the State average;
 Yellow signifies mortality rates that do not differ from the State average;
 Grey shading indicates data that were suppressed.

Figure 25. Age-Adjusted Mortality Due to Chronic Lower Respiratory Disease, by Town, Connecticut, 2006-2010



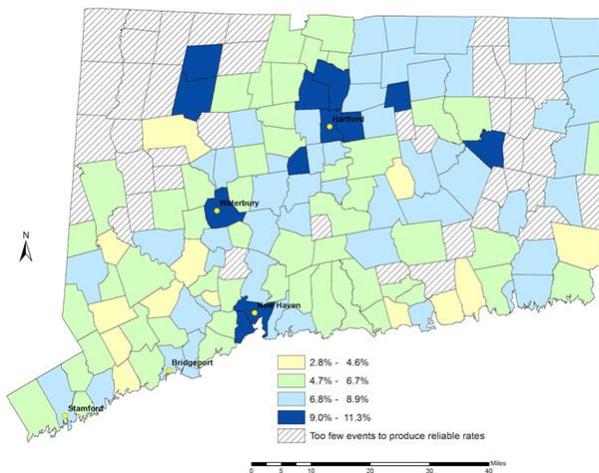
Source: Connecticut Department of Public Health, Instant Atlas, 2006-2010.
Note: Orange indicates mortality rates that exceed the State average;
Blue indicates mortality rates below the State average;
Yellow signifies mortality rates that do not differ from the State average;
Grey shading indicates data that were suppressed.

Low Weight and Pre-term Births

Low weight and preterm births are important predictors of infant survival, child development and physical well-being and can serve as proxy indicators for the health of a community.¹⁰⁵ Prevalence of preterm and low weight births is highest in urban core communities in Connecticut. From 2007 to 2011 combined, preterm and low weight births were more heavily concentrated in urban core towns, including Waterbury, Hartford, New Haven, Norwich and periphery communities (Figure 26, Figure 27).

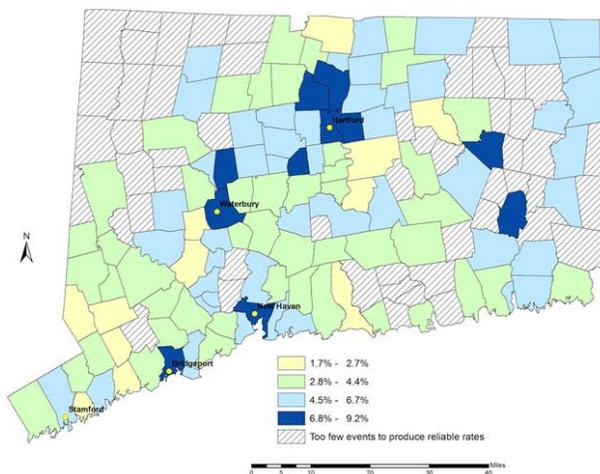
As with the rest of the nation, in Connecticut there are racial disparities in the prevalence of preterm and low weight births.¹⁰⁶ In particular, as identified in the *Healthy Connecticut 2020* State Health Assessment, a greater proportion of infants born to Black non-Hispanic women are low weight or preterm, relative to infants born to White non-Hispanic women.¹⁰⁷ This racial disparity and greater concentration of preterm and low weight births in Connecticut’s largest towns suggest that it is important to consider the intersection of social inequalities within and across communities when examining disparities in health patterns.

Figure 26. Percent of Preterm Births, by Town, Connecticut, 2007-2011



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

Figure 27. Percent of Low Birth Weight Births, by Town, Connecticut 2007-2011



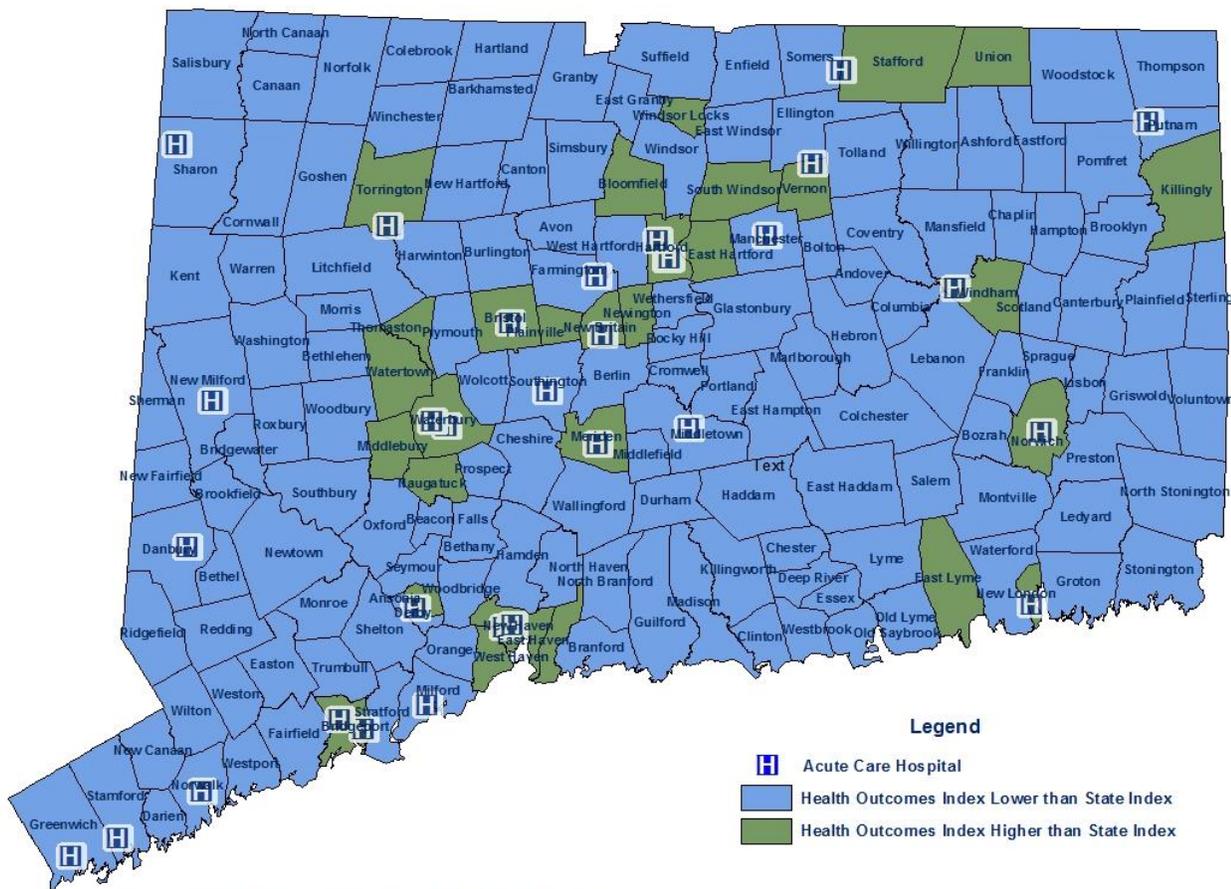
Source: Connecticut Department of Public Health, Health Statistics & Surveillance, Statistics & Analysis Reporting, 2007-2011.

Distribution of Health Outcomes Index Among Towns and Cities

The health outcomes index score examines five indicators that serve as proxies to the health of a community, due to differential access and outcomes. Looking at these by town and standardizing the scores allows for identification of towns that are significantly higher or lower than the state overall in their health outcomes.

Figure 28 shows the health outcomes index score for each town and city compared to the Connecticut index. The state health outcome index is 5; a score lower than 5 implies an individual town has better health outcomes compared to the state. Although the vast majority of towns compared favorably to the state, 29 towns had scores higher than the Connecticut index, indicating poorer health outcomes. Twenty-three of the 29 communities were urban core cities (e.g., Hartford and New Haven) and urban periphery towns (e.g., Bloomfield and Vernon); three were rural towns (Killingly, Stafford and Union); two were suburbs (East Lyme and South Windsor) and one wealthy town (Middlebury), which had an excessively high readmission rate compared to the state. Some towns and cities had at least one indicator which exceeded the state rate and remain at risk for unmet need for those indicators.

Figure 28. Health Outcomes Index, by Town



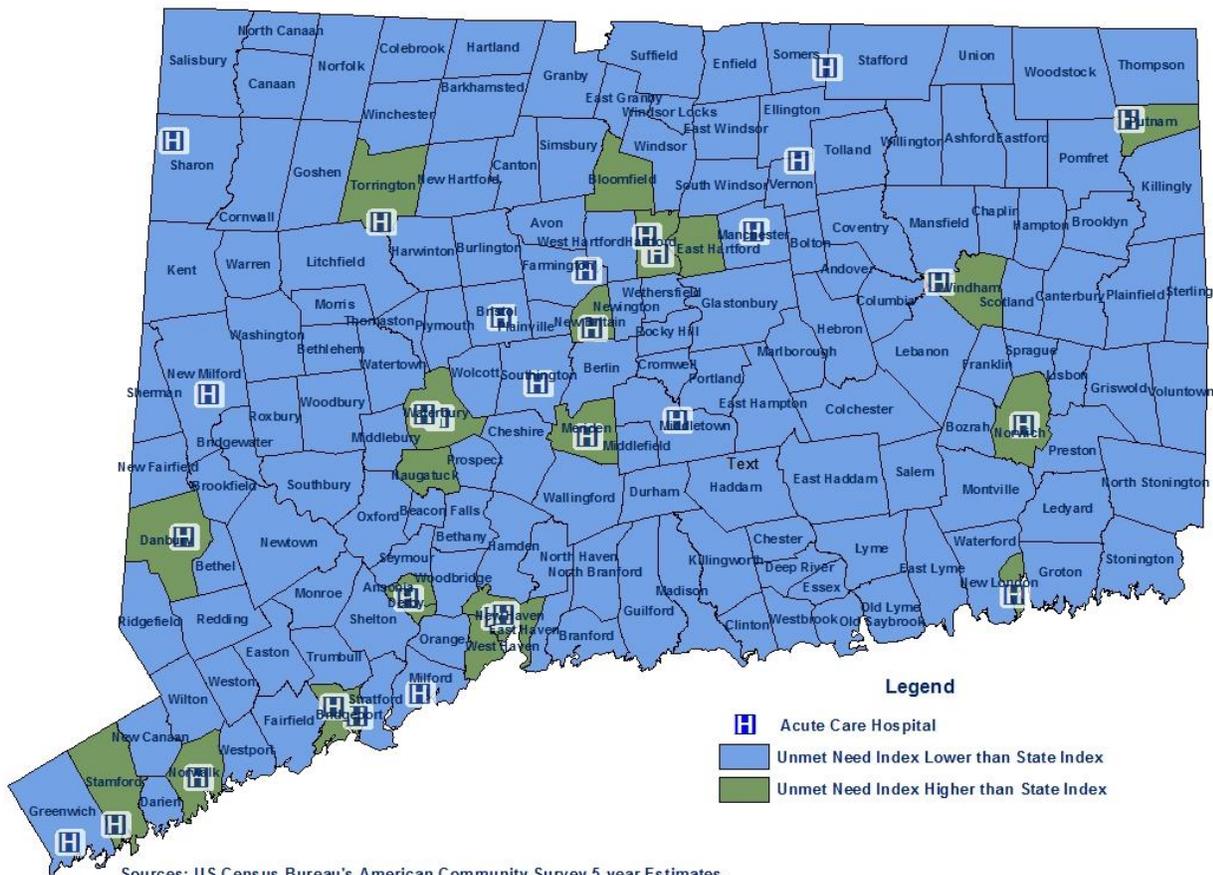
Sources: DPH Vital Records Database, Mortality Statistics Data and Acute Care Hospital Discharge Database
DPH, OHCA, December 2014

UNMET NEED COMPOSITE INDEX

Like the nation as a whole, populations in Connecticut with lower socioeconomic status are disproportionately affected by negative health outcomes. Additionally, health outcome indicators do not only show the different rates of disease, but are potential proxies for differential access to services. The unmet need composite index examines a range of SES characteristics and health outcomes compared to state rates and provide an overall indicator of unmet health care need.

The unmet need composite index is the sum of the SES and health outcome indices described in previous sections, which sum to 15 for the overall state. The index is an indicator of which towns and cities are most likely to have unmet health care need compared to the state. Most towns and cities had an index score lower than 15, except 20 communities (**Figure 29**). The exceptions were large towns and cities like Hartford, Danbury and Bridgeport, urban periphery towns like Naugatuck, Bloomfield and Windham or hospital towns like Putnam and Torrington. There were more residents in these towns with unfavorable socioeconomic status, which predisposed them to have residents with unmet need. In addition, while only 20 towns and cities had a greater disproportionate share of vulnerable populations, several towns and cities had proportions of at least one of the vulnerable subpopulations greater than the state level and remain at risk for unmet health care need. (See Appendix H).

Figure 29. Unmet Need Composite Index, by Town



Sources: US Census Bureau's American Community Survey 5-year Estimates, DPH Vital Records Database, Mortality Statistics Data and Acute Care Hospital Discharge Database. DPH, OHCA, December 2014

In addition to the indices, this Plan reviews hospital primary service areas, service availability, community health needs assessments (CHNAs) and strategic implementation plans (SIPs) to determine: hospital service geographic coverage; “orphan” towns and cities not in a hospital service area or covered by a CHNA; health care needs identified and planned interventions to alleviate any unmet health care need identified. Although the Plan focuses on in-state providers and services to address unmet need, it should be noted that some Connecticut residents living in border towns may utilize health care services in neighboring states.

HOSPITAL SERVICE AVAILABILITY

To assess health care service availability, OHCA administered a hospital survey and reviewed individual hospital’s CHNAs and SIPs. The survey and review were designed to enhance the understanding of communities included in CHNAs, identify towns not covered in CHNAs, examine decisions that influenced which towns were included in CHNAs and uncover any identified needs.

Comparison of Hospital Primary Service Area and CHNAs

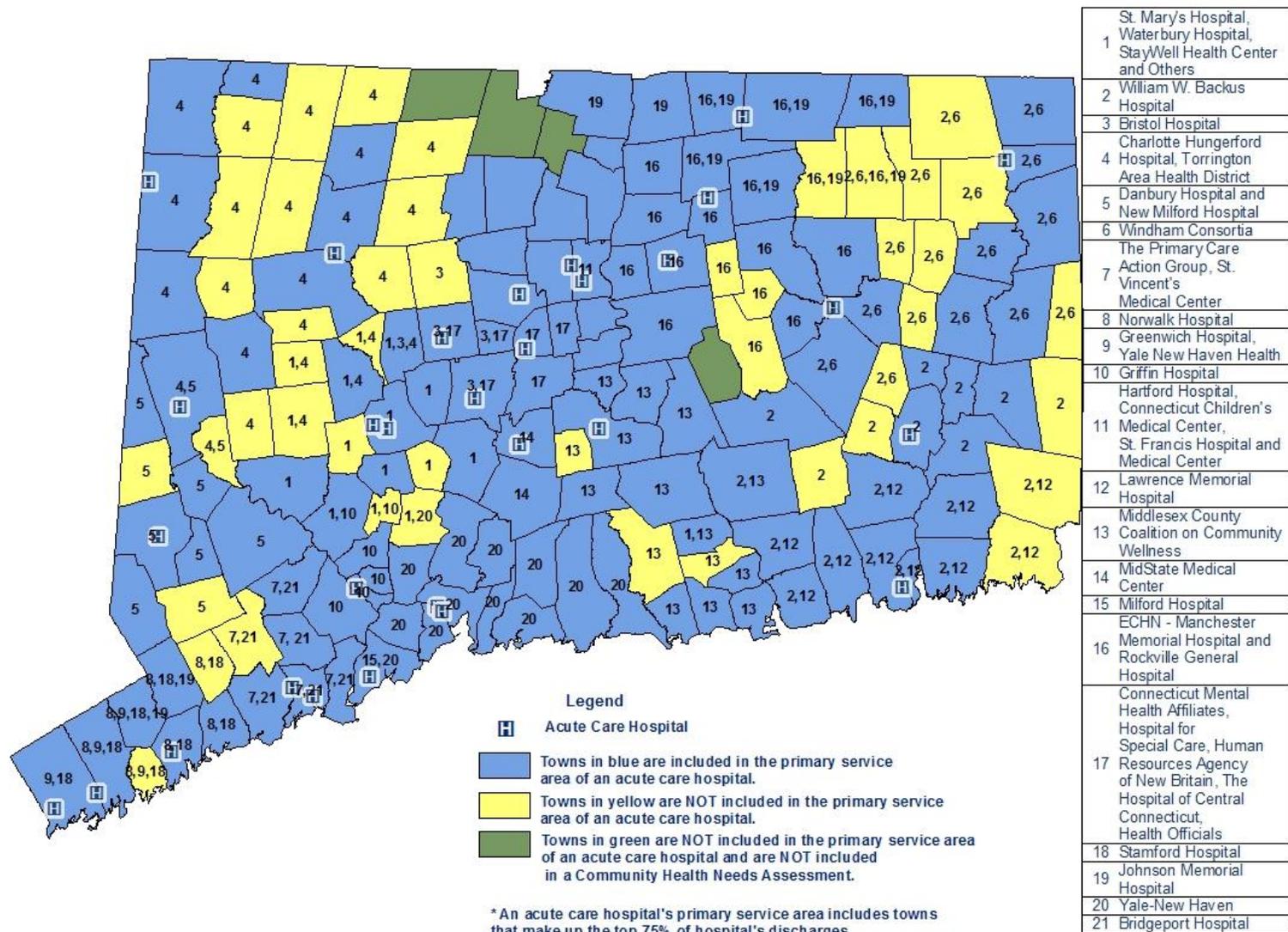
The PPACA mandates that non-profit hospitals conduct a triennial community health needs assessment and develop an implementation strategy as a requirement to maintain their tax-exempt status. This mandate offers an opportunity for hospitals and other entities to work collaboratively across sectors to identify and address health needs in their communities. A complete listing of Connecticut hospital CHNAs is available at <http://www.chime.org/advocacy/community-health/>.

Of the 21 unique CHNAs published since 2008, seven CHNAs were collaborations among multiple hospitals, while the remaining 14 were by individual hospitals. Several hospitals conducted CHNAs with their local health department and other organizations as part of a larger collaboration. While the CHNA process is being conducted throughout the state, it is unclear whether all communities in the state are included in the assessment and planning process.

The OHCA CHNA survey showed that hospitals varied in their approaches to selecting which towns to include in the CHNA. The inclusion criteria were based on primary service area of a single hospital or for all collaborators, area or town with the highest patient volume and need, or large geographic region. In several instances, CHNAs focused on a geographic area that did not fully match the primary service area of the hospital(s).

Numbers shown in **Figure 30** indicate the geographic area covered by a CHNA and match the conducting entity or entities listed on the right hand side of the map. The map shows that 14 towns in the state were not covered by a CHNA; they were a mix of rural (1), suburban (5), urban periphery (6) and wealthy (2) towns. The majority (119) of cities and towns, shaded in blue, were within the primary service area of a Connecticut hospital. As previously noted, the primary service area includes towns that make up the top 75% of a hospital’s discharges. About 30% or 46 towns, shaded in yellow, were not in any hospital primary service area. Four towns shaded in green where neither part of a hospital’s primary service area nor covered by a CHNA. Bloomfield was the only town with an unmet need index higher than the state that was not covered by a CHNA. The other 19 towns with an unmet health need index score higher than the state were all covered by a CHNA (See Appendix H for details).

Figure 30. Map of Hospital Community Health Needs Assessment Geographic Coverage and Primary Service Area, October, 2014



Source: Manual Review of Connecticut's Hospital CHNAs
Department of Public Health, Office of Health Care Access, December 2014

HOSPITAL COMMUNITY HEALTH NEEDS ASSESSMENT AND IMPLEMENTATION PLANS ACROSS CONNECTICUT

Identified Needs across the State

In reviewing the 21 community health needs assessments, several consistent areas of need were identified specifically among at-risk and vulnerable populations. **Table 25** provides a summary.

Nearly all the CHNAs identified chronic disease, overweight, obesity, nutrition and physical activity as overlapping and major health needs, regardless of the socioeconomic status of communities (except those in northeastern Connecticut). More than one-half of the assessments identified substance abuse and mental health care as priority health needs for predominantly urban and rural communities and for all communities statewide (except southeastern Connecticut). This highlights the interconnection between these two health issues.

Table 25. Top Health Needs Identified through CHNA Process, Connecticut, 2008-2014

Health Needs	Number of Assessments Identifying This Health Need	Region of State
Chronic Disease	18	All communities
Overweight, Obesity, Nutrition, & Physical Activity	16	All communities
Gaps in Primary Care	13	All communities
Substance Abuse	12*	All communities
Mental Health	12*	All communities
Gaps in Mental Health Care	7**	Rural, Urban Core, Urban Periphery
Respiratory Health	5	Urban Core, Urban Periphery, Suburban
Maternal & Child Health	5	All communities
Healthy Aging	4	Rural, Urban Core, Urban Periphery
Housing	4	Urban Core, Urban Periphery

*10 out of the 12 CHNAs identifying substance abuse as a health need also identified mental health.

**6 out of 7 CHNAs identifying gaps in mental health care also identified mental health as a health status-specific need.

New London County, several parts of Hartford County and the New Haven area identified improving respiratory health as a priority. Bridgeport, Bristol, Danbury and Milford Hospital’s health assessments all cited healthy aging as a concern in their communities.

With respect to health care need, 13 assessments identified gaps in primary care as major for urban towns, but were cited for the other socioeconomic categories of communities. Gaps in mental health and dental care were identified as priority health needs for predominantly rural and urban towns; while need for specialty care was crosscutting for towns of all categories.

Housing and maternal and child health were health needs reported in central Connecticut and healthy aging was identified as a need in central and southeastern Connecticut.

Some health assessments also identified the social determinants of health, including community socioeconomic disadvantage, housing conditions, a limited transportation infrastructure and safety as priority health concerns.

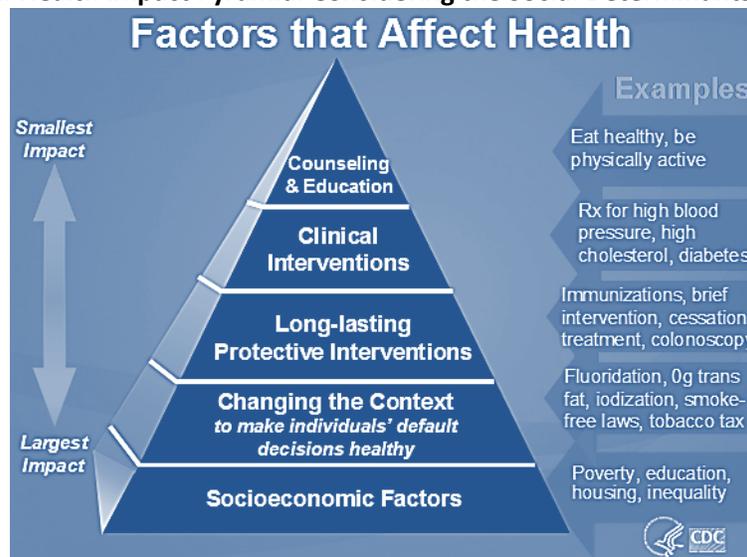
Responses to the OHCA Community Needs Assessment Survey reflected the identified needs in the CHNAs. Responding hospitals cited overweight and obesity, chronic disease, access to care, care coordination, sexual health, mental health, substance abuse, asthma, aging and tobacco-free living as priority health needs. Hospitals also identified disparities in specialty care, non-urgent ED use, barriers in accessing health care, a lack of health insurance or underinsurance, cost of care, transportation, mental health, substance abuse and oral health.

Hospital Strategic Implementation Plans to Address Community Needs

As part of the IRS mandate for non-profit hospitals, hospitals must also develop a SIP every three years that discusses how it will address the identified needs from the CHNA or whether these needs are being addressed by other community providers. In the OHCA CHNA survey, 7 out of the 10 hospitals indicated towns covered by the SIP matched the CHNA criteria such as areas of highest need and hospital primary service area.

SIPs differed in the level of focus of proposed strategies to address the health needs identified in CHNAs. Approaches include improving the health of individuals and populations, as outlined in **Figure 31**. These approaches have implications for the anticipated health impact of the intervention strategies on population health. Strategies that address factors at the base of the pyramid, or the social determinants of health, such as socioeconomic factors and improving the conditions in which people live, work and play to promote health, may yield larger improvements in population health as these strategies may reach and promote the health of a larger population.¹⁰⁸ Individually-focused strategies located toward the top of the pyramid, such as counseling, health education and clinical interventions may produce a smaller impact on the health of the population, as these interventions are often more intensive and reach a smaller subset of the population.¹⁰⁹

Figure 31. Health Impact Pyramid: Considering the Social Determinants of Health



Source: Frieden, Thomas R. A Framework for Public Health Action: The Health Impact Pyramid. *American Journal of Public Health*. April 2010, 100(4), 590-595.

These different approaches to mitigating health needs have implications for non-profit hospitals and their interpretation of community benefit categorization. For example, systems change initiatives such as strategies to improve access to quality mental health care (e.g., hiring more mental health clinicians) have the potential to sustainably address the health care needs of the identified community. However, many community benefits offices are not clear on how to “count” these systems change types of initiatives as a community benefit. Instead, community benefits programs tend to focus on charity care as well as more individual and interpersonal-focused initiatives such as community health education and health fairs because they are easier to classify for tax purposes. However, such programmatic strategies may have a limited health impact for a small proportion of the population under the hospital service area and may not provide sustainable solutions to improving the health of the community.

Ten SIPs proposed system level changes to address the health needs that emerged from the CHNAs.

These proposed system level changes include strategies:

- to improve access to primary, urgent and specialty care;
- to address unmet mental health care and substance abuse treatment needs; and
- to reduce overweight, obesity and chronic disease.

Some SIPs identified opportunities to improve access to quality health care by:

- collaborating with the Connecticut Health Insurance Exchange to ensure that residents who are eligible for health insurance enroll in the exchange;
- creating a supply of community health workers (CHWs) to facilitate the enrollment of eligible patients in the health insurance marketplace;
- considering opportunities to improve access to primary and urgent care;
- developing nurse navigator programs; and
- increasing access to specialty care for uninsured patients.

SIPs that prioritize improving access to and quality of mental health and substance abuse services proposed strategies such as:

- creating a crisis center or outpatient behavioral health walk-in center;
- establishing an ambulatory detoxification program;
- improving emergency department discharge practices for homeless psychiatric patients; and
- advocating for improved health insurance reimbursement for mental health services.

Proposed systems-level approaches to reducing overweight, obesity and chronic disease include strategies to:

- improve access to healthy and affordable foods, such as considering opportunities to collaborate with other organizations to support a community Farmer’s Market, local food coop, or community garden;
- identify opportunities to improve food choices in hospital; and
- institutionalize support for increased physical activity among students in child care settings and schools and among adults.

All SIPs focus some or most of their strategies on health education and prevention related health promotion activities such as, holding community education programs (e.g., cooking class, promotion of healthy lifestyle messages, weight loss challenges, chronic disease management training), chronic disease screening, investing in smoking cessation programs or support groups and raising awareness of existing social and health care services.

This 2014 Plan builds on the 2012 Plan, with a particular focus on implications of the health care environment and availability of and access to health care facilities and services for at risk and vulnerable populations. Whereas aggregate data suggest a general availability of health care services, there is ample evidence from outcomes data, hospital CHNAs and unmet need indices that unmet health care need exists and is unequally distributed across Connecticut's population subgroups. The SES, Outcomes and unmet need indices can provide a standard for identifying the geographic areas and subgroups with a potential unmet health care need. Specifics of the needs may further be determined through community health needs assessments.

There are several initiatives at OHCA and DPH, in collaboration with hospitals and local leadership, which are addressing prevention, reducing health inequities, improving access to primary care and enhancing the coordination of care. Some of these initiatives are briefly described in the following chapter.