Oral Health in Connecticut

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Commissioner

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Dear Colleagues:

The Connecticut (CT) Department of Public Health (DPH), Office of Oral Health (OOH) is pleased to present *Oral Health in Connecticut: 2013*. This report documents the oral health status of Connecticut's residents through an examination of oral disease burden and the system of oral healthcare in the state.

This report includes a summary of the most current data available, and seeks to promote the importance of oral health as a critical component of overall health. Data presented here should be used to guide the development and implementation of interventions and policies that seek to improve the oral health of CT's residents, particularly those who are most vulnerable.

Connecticut has made significant strides in achieving the objectives outlined in *Healthy People 2020* and the *Oral Health Improvement Plan for Connecticut: 2007-2012*, but there is much left to be done. Some highlights from this document:

Dental caries is a chronic, irreversible infection, bacterial in origin, that causes demineralization of the hard tissues and destruction of the organic matter of the tooth. Approximately one in three children in Connecticut have experienced tooth decay, 9% of whom have rampant decay in five or more teeth.

Increased reimbursement rates for Medicaid dental services for children have led to a dramatic increase in the number of Medicaid dental providers throughout the state.

The *Home By One* Program received national recognition for its efforts to establish coordinated networks of care to ensure that the parents of at-risk infants understand the importance of oral health and establish a dental home for their child by their first birthday.

Connecticut has implemented policy authorizing pediatric medical providers to perform oral health screenings, oral health risk assessments, anticipatory guidance, and fluoride varnish applications to patients enrolled in Medicaid.

Approximately 90% of CT residents served by public water systems, and 2/3 of CT's total population receive the benefits of fluoridated water.

This report represents an important step in developing a common understanding of the oral health needs of CT's residents for both decision-makers and stakeholders alike. It is our hope that the data presented here will help to identify the areas of greatest need in our state and guide the prioritization of efforts to improve the oral health of all of CT's residents.

Mission Statement:
Office of Oral Health

The OOH strives to promote health and reduce disease and health disparities in CT through enhanced oral health and oral healthcare access. The OOH works to build the public health infrastructure for oral health within the DPH and throughout CT. The goals of the OOH include the implementation of effective, culturally appropriate oral health promotion and disease prevention programs that adopt, adapt and enhance best practices. The OOH also works to centralize the collection of oral health data in order to better detect and monitor disease, inform policy, and evaluate programs.

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Section 1. Introduction

The mouth is the body's primary connection to the world. It is how we take in water and nutrients to sustain life, our primary means of communication, the most visible sign of our mood, and a major part of how we appear to others. Oral health is an essential and integral component of overall health throughout life and is much more than just healthy teeth. Oral refers to the whole mouth: the teeth, gums, hard and soft palate, linings of the mouth and throat, tongue, lips, salivary glands, chewing muscles, and upper and lower jaws. Good oral health not only means being free of tooth decay and gum disease, but it also means being free of chronic oral pain conditions, oral cancer, birth defects such as cleft lip and palate, and other conditions that affect the mouth and throat. Good oral health also includes the ability to carry on the most basic human functions such as chewing, swallowing, speaking, smiling, kissing, and singing.

The mouth is an integral part of human anatomy and plays a major role in our overall physiology. Thus, oral health is intimately related to the health of the rest of the body. For example, mounting evidence suggests that infections in the mouth such as periodontal (gum) diseases may increase the risk of heart disease, may put pregnant women at greater risk of premature delivery, and can complicate control of blood sugar for people living with diabetes. Conversely, changes in the mouth often are the first signs of problems elsewhere in the body, such as infectious diseases, immune disorders, nutritional deficiencies, and cancer.

This document summarizes the most current information available on the oral disease burden of people in CT. It also highlights groups and regions in the state that are at highest risk of oral health problems and discusses strategies to prevent these conditions and provide access to dental care. Comparisons are made with national data whenever possible and to the *Healthy People 2020* goals when appropriate. For some conditions, national data, but not state data, are available at this time. It is hoped that this information will help raise awareness of the need for monitoring the oral health burden in CT and guide efforts to prevent and treat oral diseases and enhance the quality of life of CT's residents.

Connecticut is in an excellent position to make long-lasting and profound improvements in the oral health of its residents. Recent initiatives concerning oral health in the state include the:

- Receipt of a 5-year (2008-2013) *CDC Cooperative Agreement for Oral Health Infrastructure Development* and 5-year (2013-2018) *CDC Cooperative Agreement for State Oral Disease Prevention.*
- Receipt of a 3-year, $600,000 *Targeted Maternal and Child Health Oral Health Service System* (TOHSS) grant to address infant oral health through the *Home By One* Program.
- Receipt of a National Association of Chronic Disease Directors grant to develop an action plan to improve the oral health of CT's older adults.
- Increase in Medicaid reimbursement rates for the provision of dental services to children resulting in a dramatic increase in the number of providers accepting Medicaid and Children's Health Insurance Program (CHIP) (Healthcare for Uninsured Kids and Youth [HUSKY] A & B respectively).

- Authorization for pediatric medical providers to perform caries risk assessments and fluoride varnish applications to children on HUSKY A & B through three years of age.
- Re-convening of the CT Coalition for Oral Health (CTCOH) to foster broad, multi-disciplinary dialogue among relevant stakeholders statewide to implement the activities of the *Oral Health Improvement Plan for Connecticut: 2007-2012* and the development of the *Oral Health Improvement Plan for Connecticut: 2013-2018.*
- Revision of the state statute that creates the position of Director of the State Office of Oral Health, allowing for a broader applicant pool.
- Active engagement of the Taskforce on Oral Health for Older Adults for the implementation of recommendations set forth in the *Just the Facts* report.
- Partnership with the Oral Health Research Strategic Alliance centered around "Building Collaborative Research Infrastructure to Reduce Oral Health Disparities among Low Income Older Adults."
- Establishment of the Oral Health for Older Adults Consortium when the Taskforce on Oral Health for Older Adults and the Oral Health Research Strategic Alliance combined to address oral health issues of the older adult population in Connecticut.
- Recognition of the *Home By One* Program as an "Emerging Best Practice" by the Association of Maternal and Child Health Programs (AMCHP).
- Collaboration with the DPH's Drinking Water Section to develop a statewide Fluoridation Plan and a Community Water Fluoridation workshop for public water system operators.
- Development of a statewide Oral Health Surveillance Plan to guide the development of a comprehensive system for the collection of oral health data in CT.

Oral Health in CT 2013 is a companion document to the *Oral Health Improvement Plan for Connecticut: 2007-2012* and the *Oral Health Improvement Plan for Connecticut: 2013-2018*. It is an overview of the knowledge about oral health issues in CT. *Oral Health in CT 2013* includes the most up-to-date data on oral health, and information that may facilitate the future monitoring of trends and improvements in CT's oral health.

A. Demographics of Connecticut

Connecticut is the third-smallest U.S. state. It is New England's second smallest and southernmost state. Its 4,845 square miles of land are bordered by New York to the west, Massachusetts to the north, Rhode Island to the east, and Long Island Sound to the south. Connecticut is made up of 8 counties and 169 towns and municipalities.

Table 1-1: Connecticut 2010 and 2012 Population by County, US Census Bureau Data

State	2010 Population	2012 Population Estimate
Connecticut	**3,574,097**	**3,590,347**
County	**2010 Population**	**2012 Population Estimate**
Fairfield	**916,829**	**933,835**
Hartford	**894,014**	**879,259**
Litchfield	**189,927**	**187,530**
Middlesex	**165,676**	**165,602**
New Haven	**862,477**	**862,813**
New London	**274,055**	**274,170**
Tolland	**152,691**	**151,539**
Windham	**118,428**	**117,599**

Source: U.S. Census Bureau, Population Division. Annual Estimates of the Resident Population for Counties of Connecticut April 1, 2010 to July 1, 2012 available at: h*ttp://www.census.gov*

i. Population, Population Growth, and Population Density

According to U.S. Census data, the population of CT was 3,574,097 in 2010. The projected estimate of the state's population for 2012 was 3,590,347.[1] The distribution of the 2010 and 2012 state population by county is presented in Table 1-1. Seventy-five percent of CT's population resides in three of the eight counties (Fairfield, Hartford, and New Haven) presented in Figure 1-1.

The racial distribution of CT's population is reflective of the racial distribution of the United States (U.S.) as a whole (see figure1-2).

During 1900's, CT's population grew a modest 3.6%, followed by a 4.9% increase from 2000-2010. Data on racial and ethnic composition of the state show large increases in Asian and Hispanic populations from 2000-2010.[1]

Connecticut ranks sixth in the nation with an overall population density of 738.1 persons per square mile according to 2010 U.S. Census Bureau data. This average reflects a range from a low of 29 persons per square mile in the town of Union to a high of 9,029 persons per square mile in the city of Bridgeport. [1]

Figure 1-1: 2012 U.S. Census Population Estimate; Connecticut by County

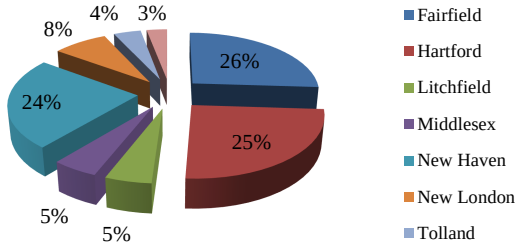
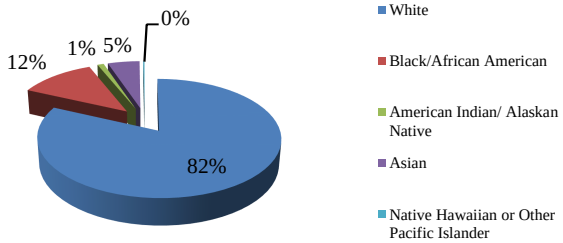


Figure 1-2: 2012 U.S. Census Population Estimates; Connecticut by Race



ii. Socioeconomic Status

Connecticut is one of the wealthiest states in the nation. In 2011, CT ranked fourth nationally in median household income ($65,753 in 2011-inflation adjusted dollars) compared to a national average of $50,502.[2] In 2011, the states per-capita income ($35,932) was well above the national average of $26,708. Despite high state income averages, 10.9% of the state's population lived below the poverty level in 2011.[2]

According to 2011 American Community Survey data, 89% of CT's residents over the age of 25 had graduated high school or higher, and 36.2% had a bachelor's degree or higher.[3]

Five Connecticuts

Despite CT's small relative size, state averages can be very deceptive. Extreme variation exists for all of the measures of socioeconomic status within the state and the counties. In order to more accurately describe the state, the Connecticut State Data Center at the University of Connecticut (UCONN) has described "Five Connecticuts."[4] Table 1-2 describes each of the five Connecticuts, which were formed on the basis of three socioeconomic variables: population density, median family income, and poverty. Table 1-3 gives socioeconomic data for each of the groups.

Table 1-2: The Five Connecticuts: Characteristics of the groupings

Grouping	Income	Poverty	Population Density
Wealthy	Exceptionally high	Low	Moderate
Suburban	Above Average	Low	Moderate
Rural	Average	Below Average	Lowest
Urban Periphery	Below Average	Average	High
Urban Core	Lowest	Highest	Highest

Table Reference: Connecticut State Data Center, University of Connecticut. The Changing Demographics of Connecticut 1990-2000: Part 2: The Five Connecticuts. [Occasional Paper OP 2004-01]. Storrs, CT: CT State Data Center; May 2004

Connecticut's per capita income is the highest in the nation, yet in 2000, 7.6% of CT's population had household incomes below the federal poverty level (FPL) and 3.7% had incomes less than 50% of the FPL.[3] Poverty in CT is concentrated in the Urban Core. In 2000, 48% of the state's poor lived in the Urban Core which represented only 18.8% of the total population. In 2000, CT's Urban Core experienced poverty at rates nearly twice the national averages. Poverty was 1.6 times the national average, extreme poverty (less than 50% of FPL) was 1.8 times the national average, the rate of families living in poverty was 1.9 times the national average, and the rate of children living in poverty was 1.7 times the national average. The city of Hartford had the highest rate of children living in poverty within the state (41%).

In addition, in 2000, 78% of CT's towns were at least 90% White; and 54% of all Hispanics and 55% of all Blacks statewide lived in the Urban Core.

Socioeconomic status is inextricably linked with health status, health literacy, access to healthcare, and health outcomes. For this reason, statewide data presented throughout this burden document cannot begin to accurately address the significant differences predicted by the five Connecticuts model. Statewide data should be viewed as a balance between extremes and as such a barometer of the state's overall progress with a keen understanding that significant outliers may exist.

Table 1-3: Socioeconomic Characteristics of the Five Connecticuts

Grouping	# of towns	Population	% of CT population	Median Family income	% living in poverty	Population Density
Wealthy	8	184,437	5%	$155,655	2.9%	872
Suburban	61	894,213	26%	$81,370	2.7%	523
Rural	63	457,770	13%	$64,750	4.7%	214
Urban Periphery	30	1,227,572	36%	$60,557	6.8%	1828
Urban Core	7	641,573	19%	$39,571	19.4%	5809
Connecticut	169	3,405,565	100%	$65,521	7.6%	703

Table Reference: Connecticut State Data Center, University of Connecticut. The Changing Demographics of Connecticut 1990-2000: Part 2: The Five Connecticuts. [Occasional Paper OP 2004-01]. Storrs, CT: CT State Data Center; May 2004

Section 2. The National and State Objectives on Oral Health

There are seventeen Oral Health Objectives in the Healthy People 2020. Connecticut has met only a few of these objectives. Due to the lack of state specific data, it is difficult to accurately assess whether CT has or has not met many of the objectives. The Healthy People 2020 objectives along with the national and state (when available) specific data are as follows:

OH-1. Reduce the proportion of children and adolescents who have dental caries experience in their primary or permanent teeth.

OH-1.1. Reduce the proportion of children aged 3 to 5 years with dental caries experience in their primary teeth.

Target: 30.0 percent

Baseline: 33.3 percent of children aged 3 to 5 years had dental caries experience in at least one primary tooth in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS

Connecticut: 19.3 percent; Target met (Head Start)
Data Source: Connecticut Department of Public Health, Office of Oral Health, Every Smile Counts Survey Data, 2011

OH-1.2. Reduce the proportion of children aged 6 to 9 years with dental caries experience in their primary and permanent teeth.

Target: 49.0 percent.

Baseline: 54.4 percent of children aged 6 to 9 years had dental caries experience in at least one primary or permanent tooth in 1999–2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS

Connecticut: 39.6 percent; Target met (Third grade)
Data Source: Connecticut Department of Public Health, Office of Oral Health, Every Smile Counts Survey Data, 2011

OH-1.3. Reduce the proportion of adolescents aged 13 to 15 years with dental caries experience in their permanent teeth.

Target: 48.3percent.

Baseline: 53.7 percent of adolescents aged 13 to 15 years had dental caries experience in at least one permanent tooth in 1999–2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-2. Reduce the proportion of children and adolescents with untreated dental decay.

OH-2.1. Reduce the proportion of children aged 3 to 5 years with untreated dental decay in their primary teeth.

Target: 21.4 percent.

Baseline: 23.8 percent of children aged 3 to 5 years had untreated dental decay in at least one primary tooth in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: 9.6 percent; Target met (Head Start)
Data Source: Data Source: Connecticut Department of Public Health, Office of Oral Health, Every Smile Counts Survey Data, 2011

OH-2.2. Reduce the proportion of children aged 6 to 9 years with untreated dental decay in their primary and permanent teeth.

Target: 25.9 percent.

Baseline: 28.8 percent of children aged 6 to 9 years had untreated dental decay in at least one primary or permanent tooth in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/NCHS.

Connecticut: 11.7 percent; Target met (Third grade)
Data Source: Data Source: Connecticut Department of Public Health, Office of Oral Health, Every Smile Counts Survey Data, 2011

OH-2.3. Reduce the proportion of adolescents aged 13 to 15 years with untreated dental decay in their permanent teeth.

Target: 15.3 percent.

Baseline: 17.0 percent of adolescents aged 13-15 years had untreated dental decay in at least one permanent tooth in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

Oral Health of Adults

OH-3. Reduce the proportion of adults with untreated dental decay.

OH-3.1 Reduce the proportion of adults aged 35-44 years with untreated dental decay.

Target: 25.0 percent.

Baseline: 27.8 percent of adults aged 35 to 44 years had untreated dental decay in at least one permanent tooth in 1999-2004.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-3.2. Reduce the proportion of adults aged 65 to 74 years with untreated coronal caries.

Target: 15.4 percent.

Baseline: 17.1 percent of adults aged 65 to 74 years had untreated coronal caries in at least one permanent tooth in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-3.3. Reduce the proportion of adults aged 75 years and older with untreated root surface caries.

Target: 34.1percent.

Baseline: 37.9 percent of adults aged 75years and older had untreated root surface caries in at least one permanent tooth in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-4. Reduce the proportion of adults who have ever had a permanent tooth extracted because of dental caries of periodontal disease.

OH-4.1. Reduce the proportion of adults aged 45 to 64 years who have ever had a permanent tooth extracted because of dental caries or periodontal disease.

Target: 68.8 percent.

Baseline: 76.4 percent of adults aged 45 to 64 years had ever had a permanent tooth extracted because of dental caries or periodontal disease in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: 44.8 percent; Target met
Data Source: Connecticut Behavioral Risk Factor Surveillance System Survey, 2010.

OH-4.2. Reduce the proportion of adults aged 65 to 74 years who have lost all of their natural teeth.

Target: 21.6 percent.

Baseline: 24.0 percent of adults aged 65 to 74 years had lost all of their natural teeth in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: 7.4 percent (adults aged 65-74years); Target met (9.2 percent for 65+)
Data Source: Connecticut Behavioral Risk Factor Surveillance System Survey, 2010.

OH-5. Reduce the proportion of adults aged 45 to 74 years with moderate to severe periodontitis.

Target: 11.5 percent.

Baseline: 12.8 percent of adults aged 45 to 74 years had moderate or severe periodontitis in 2001-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-6. Increase the proportion of oral and pharyngeal cancers detected at the earliest stage.

Target: 35.8 percent.

Baseline: 32.8 percent of oral and pharyngeal cancers were diagnosed at the localized stage (stage 1) in 2005-06
2007 oral and pharyngeal cancers were diagnosed at the localized stage (stage 1) in 2005-2006.

Data Sources: National Program of Cancer Registries (NPCR), CDC/NCCDPHP; Surveillance, Epidemiology, and End Results (SEER), NIH/ NCI.

Connecticut: 45%; Target met
Data Source: National Cancer Institute, 2009 Surveillance, Epidemiology and End Results (SEER) Program Data

Access to Preventive Services

OH-7. Increase the proportion of children, adolescent, and adults who used the oral health care system in the past year.

Target: 49.0 percent.

Baseline: 44.5 percent of persons aged 2 years and older had a dental visit in the past year in 2007.
Data Sources: Medical Expenditure Panel Survey (MEPS), AHRQ

Connecticut: 86.3 percent (Children); 81.6 percent (Adults); Target met
Data Source: National Survey of Children's Health,2011/2012; Centers for Disease Control and Prevention (CDC), 2010 Behavioral Risk Factor Surveillance System Survey Data

OH-8. Increase the proportion of low-income children and adolescent who received any preventive dental service during the past year.

Target: 33.2 percent.

Baseline: 30.2 percent of children and adolescents aged 2 to 18 years at or below 200 percent of the Federal poverty level received a preventive dental service during the past year in 2007.

Data Sources: Medical Expenditure Panel Survey (MEPS), AHRQ

Connecticut: 60 percent; Target met
Data Source: Connecticut Voices for Children, Children's Dental Services in the HUSKY Program: Program Improvements Led to Increased Utilization in 2009 and 2010, (November 2011)

OH-9. Increase the proportion of school-based health centers with an oral health component that includes dental sealants.

OH-9.1. Increase the proportion of school-based health centers with an oral health component that includes dental sealants.

Target: 26.5 percent.

Baseline: 24.1 percent of school-based health centers with an oral health component included dental sealants in 2007-08.

Data Sources: School-Based Health Care Census (SBHCC), National Assembly on School-Based Health Care (NASBHC).

Connecticut: Connecticut Data Not Available

OH-9.2. Increase the proportion of school-based health centers with an oral health component that includes dental care.

Target: 11.1 percent.

Baseline: 10.1 percent of school-based health centers with an oral health component included filling and extractions in 2007-08.

Data Sources: School-Based Health Care Census (SBHCC), National Assembly on School-Based Health Care (NASBHC).

Connecticut: There are 81 School-Based Health Centers in Connecticut of which 69 have oral health component.
Data Source: Connecticut Association of School-Based Health Centers, 2013

OH-9.3. Increase the proportion of school-based health centers with an oral health component that includes topical fluoride.

Target: 32.1 percent.

Baseline: 29.2 percent of school-based health centers with an oral health component included fluoride rinses, varnish, or supplements in 2007-08.

Data Sources: School-Based Health Care Census (SBHCC), National Assembly on School-Based Health Care (NASBHC).

Connecticut: Connecticut Data Not Available

OH-10. Increase the proportion of local health departments and Federally Qualified Health Centers (FHQCs) that have an oral health program.

OH-10.1. Increase the proportion of Federally Qualified Health Centers (FHQCs) that have an oral health care program.

Target: 83.0 percent.

Baseline: 75.0 percent of FQHCs had an oral health care component in 2007.

Data Sources: Uniform Data System (UDS), HRSA/BPHC.

Connecticut: Connecticut has 14 CHC corporations, of which 11 (78.6%) have an oral health care program. Thirteen CHC's are Federally Qualified Health Centers (FQHC's), and one is an FQHC look-alike; Target not met.

Data Source: Connecticut Department of Public Health, Community Health Centers, 2013.

OH-10.2. Increase the proportion of local health departments that have oral health prevention or care programs

Target: 28.4 percent.

Baseline: 25.8 percent of local health departments had an oral health prevention or care program in 2008.

Data Sources: Annual Synopses of State and Territorial Dental Public Health Programs (ASTDD Synopses), Association of State and Territorial Dental Directors (ASTDD)

Connecticut: Connecticut has 74 Local Health Departments/Districts of which 8 (11%) have an oral health prevention or care program; Target not met.

Data Source: Office of Local Health Administration, 2013.

OH-11. Increase the proportion of patients who receive oral health services at Federally Qualified Health Centers (FQHCs).

Target: 33.3 percent.

Baseline: 17.5 percent of patients at FQHCs received oral health services in 2007.

Data Sources: Uniform Data System (UDS), HRSA/ BPHC.

Connecticut: 27.4 percent; Target not met

Data Source: Uniform Data System, HRSA/BPHC, 2011

Oral Health Interventions

OH-12. Increase the proportion of children and adolescents who have received dental sealants on their molar teeth.

OH-12.1 Increase the proportion of children aged 3 to 5 years who have received dental sealants on one or more of their primary molar teeth.

Target: 1.5 percent.

Baseline: 1.4 percent of children aged 3 to 5 years received dental sealants on one or more of their primary molars in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-12.2 Increase the proportion of children aged 6 to 9 years who have received dental sealants on one or more of their permanent molar teeth.

Target: 28.1 percent.

Baseline: 25.5percent of children aged 6 to 9 years received dental sealants on one or more of their permanent molars in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: 42.6 percent; Target met
Data Source: Connecticut Department of Public Health, Office of Oral Public Health, Every Smile Counts Survey Data, 2011

OH-12.3 Increase the proportion of children aged 13to 15 years who have received dental sealants on one or more of their permanent molar teeth.

Target: 21.9 percent.

Baseline: 19.9 percent of children aged 13 to 15years received dental sealants on one or more of their first permanent molars and one or more second permanent molars in 1999-2004.

Data Sources: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-13 Increase the proportion of the U.S. population served by community water systems with optimally fluoridated water.

Target: 79.6 percent.

Baseline: 72.4 percent of the U.S. population served by community water systems received optimally fluoridated water in 2008.

Data Sources: Water Fluoridation Reporting System (WFRS), CDC/ NCCDPHP.

Connecticut: 91 percent; Target met
Data Source: Connecticut Department of Public Health, Drinking Water Section Data, 2010.

OH-14 (Developmental) Increase the proportion of adults who receive interventions in dental offices.

OH-14.1. (Developmental) Increase the proportion of adults who received information from a dentist or dental hygienist focusing on reducing tobacco use or on smoking cessation in the past year.

Potential Data Source: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

OH-14.2. (Developmental) Increase the proportion of adults who received an oral and pharyngeal cancer screening from a dentist or dental hygienist in the past year.

Potential Data Source: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: 87.3 percent.
Data Source: Connecticut Behavioral Risk Factor Surveillance System, 2010

OH-14.3. (Developmental) Increase the proportion of adults who were tested or referred for glycemic control from a dentist or dental hygienist in the past year.

Potential Data Source: National Health and Nutrition Examination Survey (NHANES), CDC/ NCHS.

Connecticut: Connecticut Data Not Available

Monitoring, Surveillance Systems

OH-15. (Developmental) Increase the number of States and the District of Columbia that have a system for recording and referring infants and children with cleft lips and cleft palates to craniofacial anomaly rehabilitative teams.

OH-15.1. (Developmental) Increase the number of States and the District of Columbia that have a system for recording cleft lips and cleft palates.

Potential Data Source: Annual Synopses of State and Territorial Dental Public Health Programs (ASTDD Synopses), Association of State and Territorial Dental Directors (ASTDD)

Connecticut: The Connecticut Birth Defects Registry (CTBDR) collects information on cleft lips/palate and other craniofacial anomalies through various sources of data, including reporting from birth hospitals across the state, vital records, and hospital discharge data. Reporting of birth defects to the Registry is mandatory under the Connecticut State Statutes Sec. 19a-53, 19a-54 and 19a-56a.

OH-15.2. (Developmental) Increase the number of States and the District of Columbia that have a system for referral for cleft lips and cleft palates to rehabilitative teams.

Potential Data Source: Annual Synopses of State and Territorial Dental Public Health Programs (ASTDD Synopses), Association of State and Territorial Dental Directors (ASTDD)

Connecticut: The hospital where the craniofacial anomaly is identified is responsible for referring the child to the Child Development Infoline for information. The Connecticut Deapartment of Developmental Services has a Birth to Three program which offers early intervention and support services to address developmental delay related to craniofacial abnormalities. This program is able to coordiante medical and developmental interventions for children with these anomalies.

OH-16. Increase the number of States and the District of Columbia that have an oral and craniofacial health surveillance system.

Target: 51.

Baseline: 32 States had an oral and craniofacial health surveillance system in 2009.

Data Sources: Annual Synopses of State and Territorial Dental Public Health Programs (ASTDD Synopses), Association of State and Territorial Dental Directors (ASTDD)

Connecticut currently does not have a surveillance system.

Public Health Infrastructure

OH-17. Increase health agencies that have dental public health program directed by a dental professional with public health training.

OH-17.1. Increase the proportion of States (including the District of Columbia) and local health agencies that serve jurisdictions of 250,000 or more persons with a dental public health program directed by a dental professional with public health training.

Target: 25.7 percent.

Baseline: 23.4 percent of States (including the District of Columbia) and local health agencies that served jurisdictions of 250,000 or more persons had a dental public health program directed by a dental professional with public health training in 2009.

Data Sources: Annual Synopses of State and Territorial Dental Public Health Programs (ASTDD Synopses), Association of State and Territorial Dental Directors (ASTDD)

Connecticut does not have any local health departments that serve 250,000 or more population. The CT Department of Public Health serves over 250,000 and the dental public health program is directed by a dental professional with public health training.

Data Source: Connecticut Department of Public Health, 2012.

OH-17.2. Increase the number of Indian Health Service Areas and Tribal health programs that served jurisdictions of 30,000 or more persons had a dental public health program directed by a dental professional with public health training in 2010.

Target: 12 programs.

Baseline: 11 Indian Health Service Areas and Tribal health programs that served jurisdictions of 30,000 or more persons had a dental public health program directed by a dental professional with public health training in 2009.

Data Sources: Indian Health Service, Division of Oral Health

There are two tribal nations in Connecticut, the Mohegan and the Mashantucket Pequot Indians. They do not have dental programs at their health centers. However, the tribes provide dental insurance to tribal members. There are not any local health departments that serve 250,000 or more persons in Connecticut.

Section 3. The Burden of Oral Diseases

A. Prevalence of Disease and Unmet Need – Children

Although dental caries is largely preventable, it remains one of the most common chronic diseases in children. It is about five times as common as asthma and seven times as common as hay fever. [1,2] Among children, untreated cavities can cause pain, dysfunction, school absences, difficulty concentrating, and poor appearance – problems that greatly affect a child's quality of life and ability to succeed. Children from lower-income families often do not receive timely treatment for tooth decay, and they are more likely to suffer from these problems. Dental caries, both untreated and treated, and tooth loss are key indicators of oral health and are used to monitor oral health status in the United States and internationally [(1,7).]

Dental Caries

Dental caries is a progressive, cumulative, and infectious oral disease process. Bacteria present in biofilms on the surface of the teeth (plaque), produce acid that breaks down the tooth structure, and causes cavitations (cavities) in the teeth. This disease process can lead to nerve destruction in the tooth, inadequate tooth function, unsightly appearance, pain, tooth loss, abscess, and systemic infection.

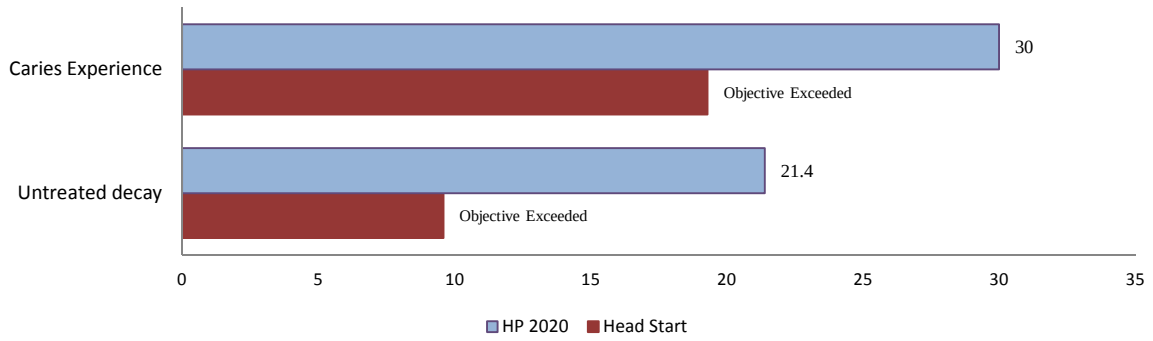
3 to 5-year-olds
Caries Experience

The Healthy People 2020 objective OH-1 is to reduce the proportion of children and adolescents who have dental caries experience in their primary or permanent teeth. The Healthy People 2020 age-specific target for caries experience in 3 to 5-year-olds is 30%.[4] Although prevalence of dental caries has been declining in the United States, the magnitude of the decline has varied across different population groups during the past two decades. [3]

According to data collected as part of the National Health and Nutrition Examination Survey (NHANES) from 1999-2004, 27.9% of children ages 2-5 years have experienced dental decay (Dye 2007). Comparing NHANES data from 1988-1994 and 1999-2004, children 2-4 years were the only age group that exhibited an increase in dental caries experience.[2] Significant increases for subgroups among 2-5 year-olds included children from White, Non-Hispanic households (increase of 7.52%), children from households with an income of greater than 200% of FPL (increase of 4.46%), and males (increase of 7.57%).[3] The mean number of decayed or filled primary teeth among 2-5 year-olds in the NHANES survey (1999-2004) was 1.17.[3]

The 2011 *Every Smile Counts* survey of Head Start students in CT found that 19.3% of students surveyed had experienced dental decay and 1 out of 10 had untreated decay. This data indicates that Connecticut has met the Healthy People 2020 target for these objectives (see figure 3A-1) [5]. The decay rate among three-year-olds was 23%; among four-year-olds in the same group the decay rate was 17.9%.

Figure 3A-1: Percentage of Connecticut Head Start Children with Untreated Decay and Caries Experience, 2011 and Healthy People 2020 Objectives



A breakdown of caries experience among Head Start students by race indicates that there was no statistically significant difference in dental caries experience between white and minority Head Start students (see figure 3A-2).[5] Similar findings observed among these students for untreated decay. This result may reflect a greater homogeneity of potential risk factors (such as socioeconomic status and parental education level) among Head Start students than among the general population.

Figure 3A-2: Percentage of Connecticut Head Start Children with Untreated Decay and Caries Experience by Race/Ethnicity, 2011

Untreated Decay

The Healthy People 2020 OH objective-2 target for untreated dental decay in primary teeth among 3 to 5-year-olds is 21.4%.[4] According to NHANES data collected between 2009-2010, 14% of 3 to 5-year-olds had untreated dental caries in their primary teeth at the time of screening.[6] The prevalence of untreated caries among children aged 3-5 was significantly higher for non-Hispanic black children (19%) compared with non-Hispanic white children (11%). For children aged 3-5 and 6-9 years living at or below 100% of federal poverty level, untreated dental caries was significantly higher compared with children living above poverty level.

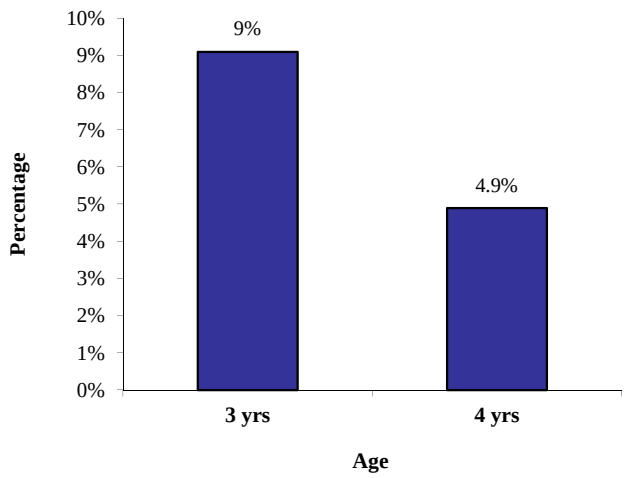
On the state level, according to data collected during the *Every Smile Counts* survey in 2011, the rate of untreated dental decay among children enrolled in Head Start was 9.6% (see figure 3A-2).[5]

As part of the *Every Smile Counts* survey, Head Start students were also evaluated for the need for treatment: 11.9% of 3-year-olds, 5.7% of 4-year-olds, and 6.5% of Head Start students overall had a need for dental treatment.[5]

Rampant Decay

In addition to data collected on caries experience, students were also evaluated for "rampant decay" during the 2011 *Every Smile Counts* survey. "Rampant decay" was defined as 5 or more teeth with evidence of treated or untreated decay. Among Head Start students, 9.1% of 3-year-olds and 4.9% of 4-year-olds had evidence of rampant decay (see figure 3A-3).[5]

Figure 3A-3: Percentage of Connecticut Head Start Students with Rampant Decay 2011 Every Smile Counts Data

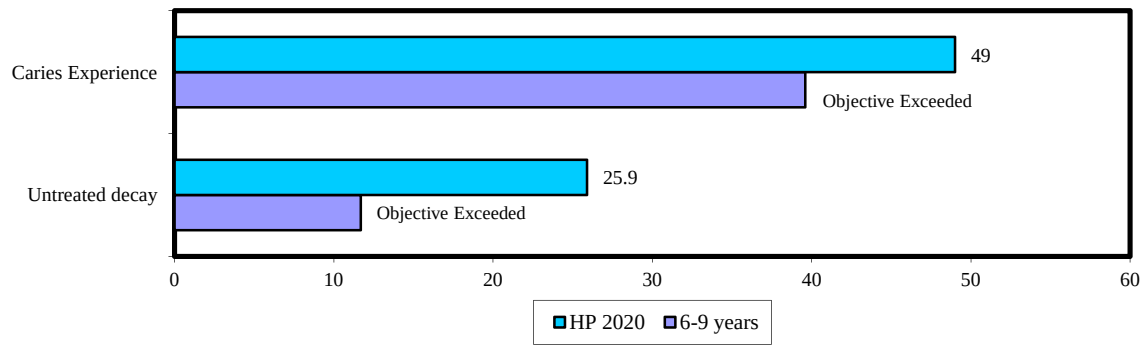


6 to 9-year-olds
Caries Experience

Healthy People 2020 Objective OH-1.2 seeks to reduce the proportion of children aged 6-9 years with dental caries experience in their primary and permanent teeth, with a target of 49.0%.[4] The 2011 *Every Smile Counts* survey indicates that Connecticut has met the HP2020 target for this Objective (see figure 3A-4).

Data collected for NHANES from 1999-2004 found that 53.20% of 6-8 year-olds had experienced dental caries. This represents a significant decrease for 6-9 year-olds from 1999-2004, when the prevalence was 53.2%.[3] A significant increase in dental caries experience was noted for Black, Non-Hispanics in this age group (6.71%).[3] Dental caries experience in the broader age group of 6-11 year-olds was 51.17%, with a mean number of 1.84 decayed or filled primary teeth.[2]

Figure 3A-4: Percentage of Connecticut Children Ages 6-9 with Caries Experience and Untreated Decay, 2011 and Healthy People 2020 objectives



Nationally, among 6-8-year-olds, 10.16% of children have caries experience in their permanent teeth. This represents a significant decrease from the 1988-2004 data (4.31%).[3] The mean

number of Decayed, Missing, or Filled (DMF) permanent teeth among 6-8-year-olds was 0.19. While there was no significant change in this measure for this age group as a whole, there were significant decreases in DMF permanent teeth for White, Non-Hispanic 6-8-year-olds (0.15) and children from households with an annual income of >200% of FPL.(0.15).

In the 2011 *Every Smile Counts* survey, sampling of this age group was based on academic grade instead of age. A total of 8,410 students enrolled in Kindergarten and Third Grade in 74 schools were surveyed.[5] The mean age among the 4,069 kindergarten students surveyed was 5.2 years while the mean age of the 4,339 3rd grade students surveyed was 8.3 years.[5] The slight difference in sampling strategy between Connecticut *Every Smile Counts* survey data and NHANES data should be considered when comparing values from these two sources.

Among kindergarten students surveyed during the 2011 *Every Smile Counts* survey, 28.6% had caries experience in their primary and/or permanent teeth and 9.2% showed signs of rampant decay.[5] Among third graders surveyed, 39.6% of students had caries experience in their primary and/or permanent teeth, with 8.4% exhibiting caries experience in their permanent teeth, and 13.3% of students with evidence of rampant decay.[5] Caries and rampant decay experience for students surveyed during *Every Smile Counts* are displayed in figure 3A-5. Figure 3A-6 compares caries experience among 3rd grade students of CT's rates to the rates observed in other states conducting the Basic Screening Survey.

Figure 3A-5: Oral Health Status of Three Student Populations in Connecticut, 2011 Every Smile Counts data

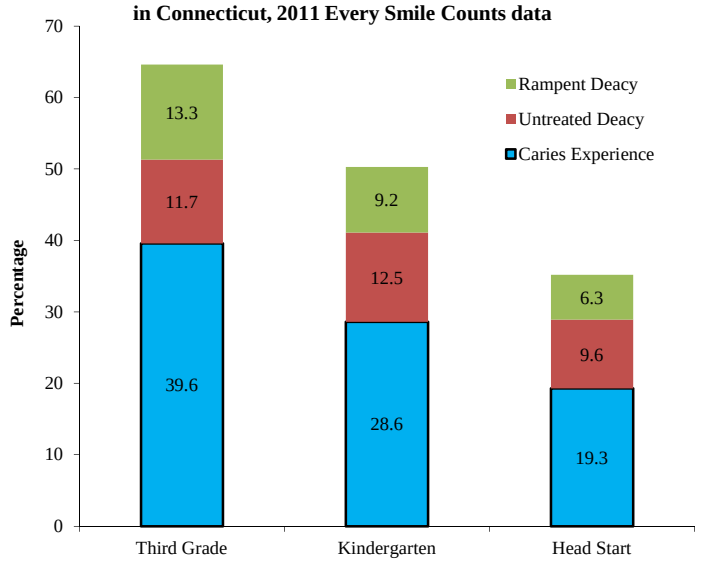


Figure 3A-6: Rates of Caries Experience Among 3rd Grade Students in States Conducting the Basic Screening Survey

Figure Reference: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Oral Health Branch. Oral Health Maps [online]. 2009. [accessed 2009 April 9]. URL http://apps.nccd.cdc.gov/gisdoh/

Untreated Caries

The Healthy People 2020 target for untreated dental decay in the primary or permanent teeth of 6-9-year-olds is 25.9%.[4] According to NHANES data collected from 2009-2010, the rate of untreated dental decay among 6-9-year-olds was 17%.[6] This is a considerable reduction from 2003-2004, when the prevalence was over 25%.[3]

According to 2011 *Every Smile Counts* survey data, 12.5% of kindergarten and 11.7% of CT third graders have untreated dental decay in their primary and/or permanent teeth (see figure 3A-5).[5] Among 3rd graders, 9.6% had untreated dental decay in their primary teeth, 1.1% had untreated dental decay in their permanent teeth, and 0.9% had untreated dental decay in both the primary and permanent teeth.[3] In CT, the Healthy People 2020 target of 25.9% for untreated dental decay has been met for third grade students (ages 6-9). A comparison of untreated decay rates for 3rd grade students in states conducting the Basic Screening Survey is presented in figure 3A-8.[5]

Among kindergarten students surveyed as part of *Every Smile Counts*, 10.0% were in need of early dental care, and 1.6% were in need of urgent dental care ("urgent need" was used for children experiencing pain or active infection).[5] Among CT third grade students, 11.2% were in need of early dental care, and 1.5% were in need of urgent dental care.[5]

Figure 3A-7: Need for Dental Care in Three Student Populations 2011 Every Smile Counts Data

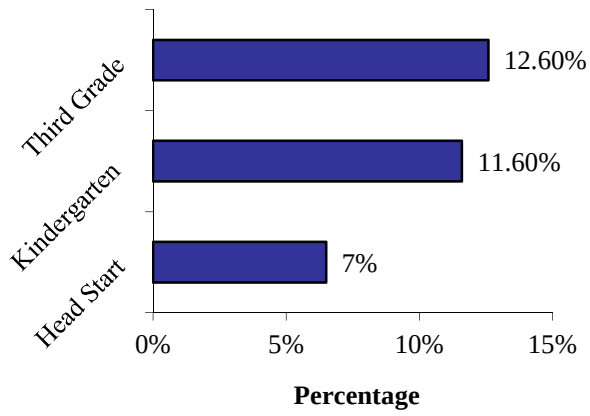


Figure 3A-8: Rates of Untreated Decay Among 3rd Grade Students in States Conducting the Basic Screening Survey

Figure Reference: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Oral Health Branch. Oral Health Maps [online]. 2009. [accessed 2009 April 9]. URL http://apps.nccd.cdc.gov/gisdoh/

Children 9-11

Connecticut does not have state-specific data on the burden of oral disease in children beyond the third grade. Data presented here comes from national sources.

Dental Caries

According to NHANES data, dental caries experience in the permanent teeth of U.S. children ages 9-11 did not change significantly between 1988-1994 and 1999-2004 (see table 3A-1).[3] The national rate of 31.36% for dental caries experience in the permanent teeth of 9-11 year olds is more than three times the rate observed for CT third graders (8.4%) and the national rate for 6-8 year-olds (10.7%). The exponential increase in decay experience between these two age groups supports the importance of targeted interventions timed to the eruption of the permanent teeth.

The mean number of DMF permanent teeth per child aged 9-11 decreased significantly between 1988-1994 and 1999-2004 on a national level. Declines in this measure can be attributed to significant reductions observed for White, Non-Hispanic children, and children from households with incomes greater than 200% of FPL.[3]

Untreated Dental Decay

According to NHANES data, there was no significant change in untreated dental decay rates in the permanent teeth of U.S. children ages 9-11 between 1988-1994 and 1999-2004 (See table 3A-1).[3]

Table 3A-1: Measure of Oral Disease Burden among Children ages 9-11, United States

Measure	1988-1994	1999-2004
Rate of dental caries experience in the permanent teeth	35.90 %	31.36 %
Rate of untreated tooth decay in the permanent teeth	10.56 %	11.05 %
Mean number of Decayed, Missing, Filled Teeth (DMFT) in the permanent teeth	0.86	0.69*

*statistically significant difference between 1988-1994 and 1999-2004
Data Source: Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G, et. al. Trends in oral health status: United States, 1988-1994 and 1999-2004. National Center for Health Statistics. Vital Health Stat 11 (248). 2007.

Adolescents 12-19

Connecticut does not have state-specific data for adolescents aged 12-19, data presented here is from national data only.

Dental Caries

American adolescents aged 12-19 had an 8.7% reduction ($p < 0.05$) in the prevalence of dental caries in permanent teeth between 1988-1994 (67.80 %) and 1999-2004 (59.11 %).[3] This rate represents a nearly two-fold increase in prevalence of caries experience in permanent teeth compared to the 9-11 year-old age group.

Healthy People 2020 Objective OH-1.3 sought to reduce the proportion of adolescents with dental caries experience in their permanent teeth to no more than 48.3%.[4] The data measure used to evaluate progress towards this goal is the prevalence of dental caries in the permanent teeth of adolescents aged13-15 year-olds. According to NHANES data, 56.11% of 15-year-olds nationally had decay experience in their permanent teeth from 1999-2004, a figure that was not significantly less than the baseline of 61.20% measured in 1988-2004.[3]

According to NHANES data from 1988-1994 and 1999-2004, American adolescents experienced a significant reduction in the mean number of decayed, missing, or filled permanent teeth.[3] This reduction was observed across racial and ethnic groups and across household income levels.

Untreated Dental Decay

There was no significant change in the prevalence of untreated decay among all adolescents aged 12-19 in the U.S. between 1989-1994 and 1999-2004, according to NHANES data (see table 3A-2).[3] A significant reduction was noted for youth from households below the poverty line, but this did not extend to the population as a whole.

Healthy People 2020 Objective OH-2.3 sought to reduce the proportion of adolescents with untreated dental caries in their permanent teeth to no more than 15.3%.[4] No significant reduction in the proportion of 15-year-olds with untreated decay in their permanent teeth was noted by NHANES between 1988-19994 (19.76 %) and 1999-2004 (8.20 %).[3] This measure has not yet been met.

Table 3A-2: Measure of Oral Disease Burden among Children ages 12-19, United States

Measure	1988-1994	1999-2004
Rate of dental caries experience in the permanent teeth	67.80 %	59.11 %*
Rate of untreated tooth decay in the permanent teeth	20.57 %	19.59 %
Mean number of Decayed, Missing, Filled Teeth (DMFT) in the permanent teeth	3.10	2.55*

*statistically significant difference between 1988-1994 and 1999-2004

Data Source: Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G, et. al. Trends in oral health status: United States, 1988-1994 and 1999-2004. National Center for Health Statistics. Vital Health Stat 11 (248). 2007.

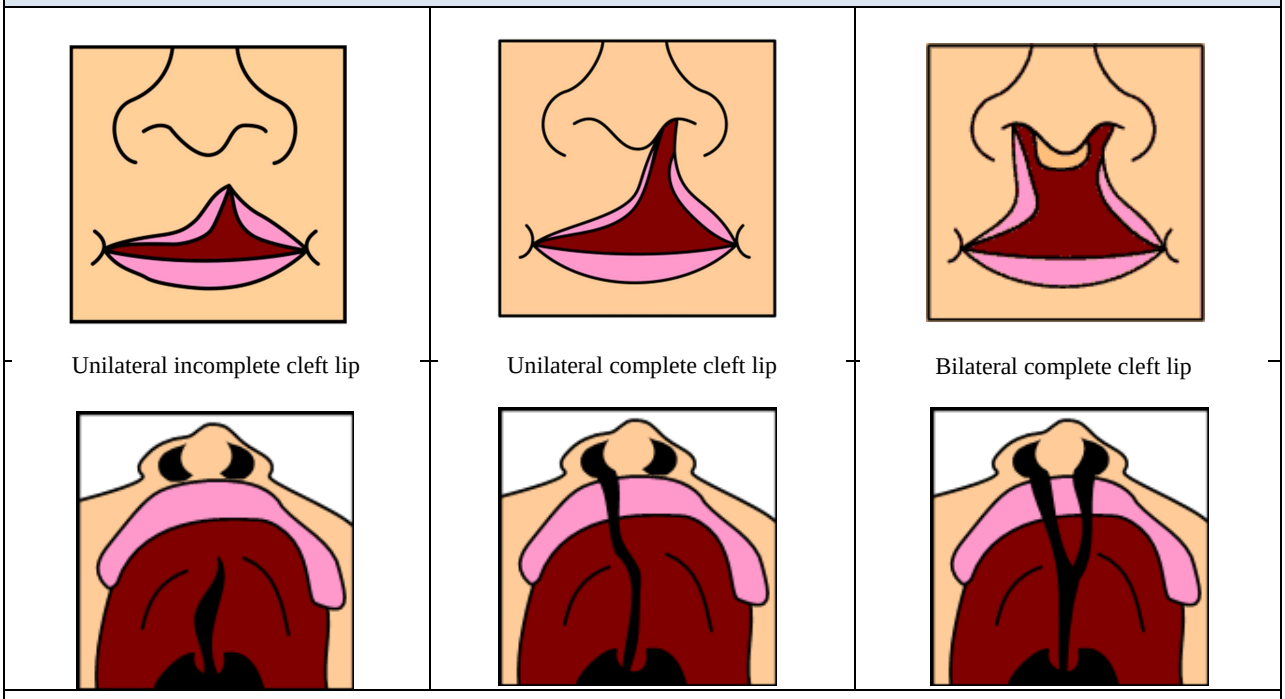
Special Topic A-i: Cleft Lip/Palate in Connecticut

Description

A birth defect is an abnormality of structure, function or metabolism present at birth that results in physical or cognitive disabilities and/or death (NIH website). Birth defects affect about 1 in every 33 live births in the US.[1] Among the thousands of characterized birth defects, two types of birth defects are associated with the oral cavity: cheiloschisis (cleft lip) and palatoschisis (cleft palate).

During embryonic development, the prominent features of the face are formed as a result of the complex fusion of multiple tissue buds between the sixth and eleventh week of gestation (Odaci). Cleft Palate (palatoschisis) results from the congenital failure of the palate to fuse properly forming a grooved depression or fissure in the roof of the mouth. This defect varies in degree of severity. The fissure can extend into the hard palate, soft palate and into the nasal cavities. Cleft lip (cheiloschisis) results from the congenital failure of the fetal components of the lip to fuse or join, forming a groove or fissure in the lip. Clefts of the lips and/or palate may be "unilateral" or asymmetrical to one side, or "bilateral," occurring on both sides equally. Clefts that extend to the nose are known as "complete"; those that do not are termed "incomplete."

C. **Figure 3A-i -1: Orofacial Defects**



Graphics attributed to Frank Buiting, Sint-Oedenrode, the Netherlands. Available from: http://en.wikipedia.org/wiki/Cleft_lip_and_palate

The risk factors for cleft lip with or without cleft palate are largely unknown. Research suggests that the cause of orofacial clefts may be multifactorial. Variables which appear to contribute to the development of orofacial clefts include: genetic factors, maternal smoking, consumption of folic acid, exposure to certain medications, and infections during pregnancy (Yazdy, Honein, Chakravarti, Botto).

Infants born with orofacial defects have difficulty with feeding, frequent ear infections and possible hearing loss, speech difficulties, and dental problems. Children with orofacial defects are usually referred to multidisciplinary teams of specialists including: a pediatrician, a plastic surgeon, dental specialists including an orthodontist, an otolaryngologist, a speech pathologist, an audiologist, and a social worker and/or therapist. Surgical intervention to correct cleft lip is usually done around three months of age. Surgical repair for cleft palate is usually between six and eighteen months of age. Multiple surgeries may be required to complete the repair and achieve the ideal cosmetic result.

National Prevalence

Birth defects tracking systems are important for finding and collecting information about birth defects. Although, 41 states have birth defects tracking programs, the Centers for Disease Control and Prevention (CDC) funds 14 population-based state programs. The tracking systems use the data for prevention and referral of affected infants and children with birth defects to needed services. The CDC and the National Birth Defects Prevention Network (NBDPN) have published a new study updating the national prevalence estimated for selected birth defects in the U.S. from 2004-2006. This study determines the national prevalence estimates for 21 selected major birth defects using data from the 14 surveillance systems. The adjusted national estimates of the selected defects are presented in Table 3A-i-1.[2] After adjustment for maternal racial/ethnicity, cleft lip with or without cleft palate was the second most common birth defect of those examined, with an estimated adjusted national prevalence of 10.63 per 10,000 live births or 1 in 940 live births. This means there are about 7,000 babies born with a cleft palate, cleft lip or both each year in the U.S.

Table 3A-i-1: Adjusted National Prevalence Estimates of Orofacial Defects and Estimated Number of Cases in the United States, 2004-2006*

Birth defect Adjusted for maternal race/ethnicity**	Cases per Births	Estimated Annual Number of Cases	Estimated National Prevalence per 10,000 Live Births
Cleft palate only	1 in 1,574	2651	6.35
Cleft Lip with or without cleft palate	1 in 940	4437	10.63

*The 14 programs included in this table are Arkansas, Arizona, California [8-county Central Valley], Colorado, Georgia [5-county metropolitan Atlanta], Illinois, Iowa, Kentucky, Massachusetts, North Carolina, Oklahoma, Puerto Rico, Texas, and Utah. The number of live births represented by these 14 programs from 2004-2006 was 4,038,506.
**Adjustments are based on United States live birth population, 2004-2006.
Source: Parker SE, Mai CT, Canfield MA, Rickard R, Wang Y, Meyer RE, Anderson P, Mason CA, Collins JS, Kirby RS, Correa A; for the National Birth Defects Prevention Network. Updated national birth prevalence estimates for selected birth defects in the United States, 2004-2006. Birth Defects Res A Clin Mol Teratol. 2010.

Connecticut Prevalence

The CT DPH monitors birth defects through the Connecticut Birth Defects Registry (CTBDR), a passive surveillance system developed to collect information about birth defects that occur among state residents. It was established in 2002. Reporting of birth defects to the CTBDR is mandatory under the CT State Statutes Sec. 19a-53, 19a-54 and 19a-56a. The system collects information on birth defects from three primary sources of data, including reporting from birth hospitals across the state, vital records, and hospital discharge data. The reporting of birth defects information from birth facilities is part of the electronic Newborn Screening System (NSS). Newborns with birth defects diagnosed before discharge from hospitals are reported to the CTBDR through the NSS. This information is linked to the electronic birth certificates in the Vital Records Section of the CT DPH for quality assurance purposes. The congenital anomalies recorded on the birth certificates are compared with those reported by birth hospitals. To ensure completeness of case reporting, CTBDR also uses in-patient hospital discharge data through a contract with the Connecticut Hospital Association. The three data sources are merged to create a consolidated dataset for CTBDR (CT DPH BDR report).

Between 2005 and 2008 in CT, the average number of cases of cleft lip with or without cleft palate was 115, for a prevalence rate of 6.73 per 10,000 live births (see Table 3A-i-2). During the same time period, the average number of cases of cleft palate alone was 82, for a prevalence rate of 4.95 per 10,000 live births.[3]

Table 3A-i-2: Birth Defects Counts and Prevalence, CT, 2005-2008

	2005	2006	2007	2008	2005-2008^	
	N	N	N	N	N	Rate*
Cleft palate alone	19	18	21	24	82	4.95
Cleft lip with or without cleft palate	21	41	37	16	115	6.95

*Rates are per 10,000 live births. Source: Connecticut Birth Defects Registry 2005,2006,2007,2008.

^Source: Selected Birth Defects Data from Population-based Birth Defects Surveillance Programs in the United States, 2004-2008 (pages 1028–1149) Available from: http://www.nbdpn.org/docs/2011_AR_Data.pdf

Rates of cleft lip with or without cleft palate by gender are presented in Table 3A-i-3, and rates of orofacial defects by race/ethnicity are presented in Table 3A-i-4.

Table 3A-i-3: Frequency and Prevalence Rates of Orofacial Defects by Gender, CT, 2005-2008

	Male		**Female**		**Total**	
	N	**Rate***	**N**	**Rate**	**N**	**Rate**
Cleft palate alone	26	1.57	56	3.38	82	4.95
Cleft lip with or without cleft palate	69	4.16	46	2.77	115	6.94

*Rates are per 10,000 live births. Source: Connecticut Birth Defects Registry 2005-2008.

Table 3A-i-4: Frequency and Prevalence of Orofacial Defects by Race/Ethnicity, CT, 2005-2008

	Non-Hispanic White		Non-Hispanic Black		Hispanic		Asian or Pacific Islander	
	N	Rate*	N	Rate*	N	Rate*	N	Rate*
Cleft palate alone	56	5.66	6	3.02	14	4.13	6	6.70
Cleft lip with or without cleft palate	65	6.57	15	7.55	30	8.85	5	5.58

*Rates are per 10,000 live births
Source: Selected Birth Defects Data from Population-based Birth Defects Surveillance Programs in the United States, 2004-2008 (pages 1028–1149) Available from: http://www.nbdpn.org/docs/2011_AR_Data.pdf

A comparison of state and national prevalence data is presented in Table 3A-i-5. The CT rate of cleft palate alone, and cleft lip with or without cleft palate is significantly lower than the national estimate.[4]

Table 3A-i-5: Orafacial Defects Counts and Birth Prevalence, Connecticut and US

	Connecticut^		US†	
	2005-2008		2004-2006	
	Average annual number of cases	Birth prevalence*	Average annual number of cases	Birth prevalence*
Cleft palate alone	82	4.95	2,651	6.35
Cleft lip with or without cleft palate	115	6.95	4,437	10.63

^Source: Connecticut Birth Defects Registry, 2005-2008
† Source: Estimates based on pooled data from birth years 2004-2006
* Prevalence are per 10,000 live births

B. The Prevalence of Disease and Unmet Need - Adults

The burden of oral disease in children can be well-characterized by the number of surfaces and/or teeth with decay experience and the amount of untreated decay. Because dental caries is a chronic and progressive infection, adults experience multiple manifestations of the cumulative effects of prolonged infection. The burden of oral disease in adults is therefore described not only by rates of treated and untreated decay but also by tooth loss, and measures of periodontal disease.

No systematic, statewide surveillance of the oral health of CT adults has been conducted. Therefore, only a limited amount of state-specific data for this population group is available. National data will be presented and supplemented with state data whenever possible.

Perceived Oral Health Status

Self-assessment of oral health status, especially when compared with clinical screening is an important means of evaluating the perceived significance of oral health and disease among the general population. According to the 2008 National Health Interview Survey (NHIS), among adults aged 18-64, about 75% had very good or good oral health, 17% had fair oral health, and 7% had poor oral health.[1]

Dental Caries

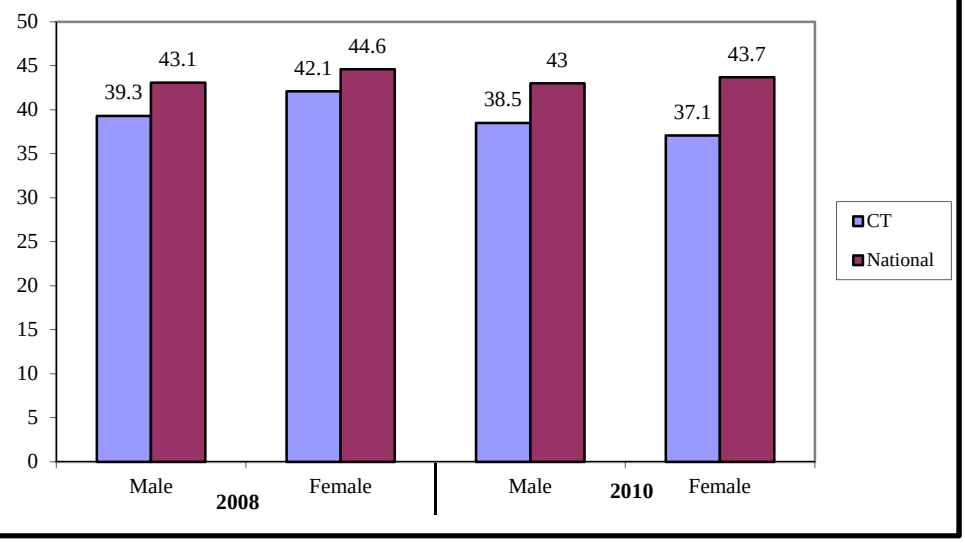
Adults are susceptible to coronal decay, decay of the crown (the exposed enamel) covered portion of the tooth, as well as root caries. Root caries are decay affecting the subgingival (below the gum line) portion of the tooth. Root caries occur when the root surface of the tooth is exposed to bacteria and carbohydrates as a result of gum recession. According to 1999-2004 NHANES data, 92% of U.S> adults 20-64 years of age have dental caries experience in their permanent teeth, a significant decrease compared to 1988-1994.[2]Among adults 20-34 years old, a significant decrease in the number of DMF teeth was also observed, with a mean DMF of 10.33 in 1999-2004 compared to 12.54 in 1988-1994.[2]

A significant decrease in root caries has also been observed. Between 1999-2004, 14.23% of U.S. adults aged 20-64 years had evidence of decayed or restored root caries, down from 18.67% between 1988-1994.[2]

Untreated Caries

The prevalence of untreated caries is evidence to the rate of disease in the population and the utilization of dental services. *Healthy People 2020* objective OH-3 sought to reduce the prevalence of untreated tooth decay in adults. In 2005-2008, more than one in five people had untreated dental caries and three in four people had at least one dental restoration in the U.S .[3] The prevalence of untreated caries among younger adults aged 20–44 was 25% and gradually decreased among the older age groups to approximately 20% for adults aged 65 and over. Prevalence of untreated caries was nearly twice as high for non-Hispanic black persons (34%) compared with non-Hispanic white persons (18%) in 2005–2008. Prevalence of untreated caries was significantly higher for both non-Hispanic black and Mexican-American persons compared with non-Hispanic white children, adults, and older adults. Prevalence of untreated caries was significantly higher for adults living below 100% of the federal poverty level compared with those living at the 200% level or higher.

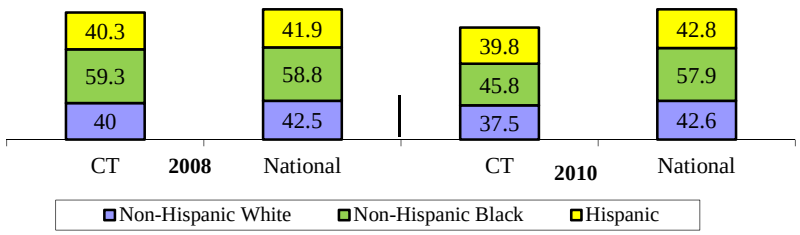
Figure 3 B-1: Adults that have had any permanent teeth extracted by Gender, CT and National, 2008 and 2010



Tooth Loss

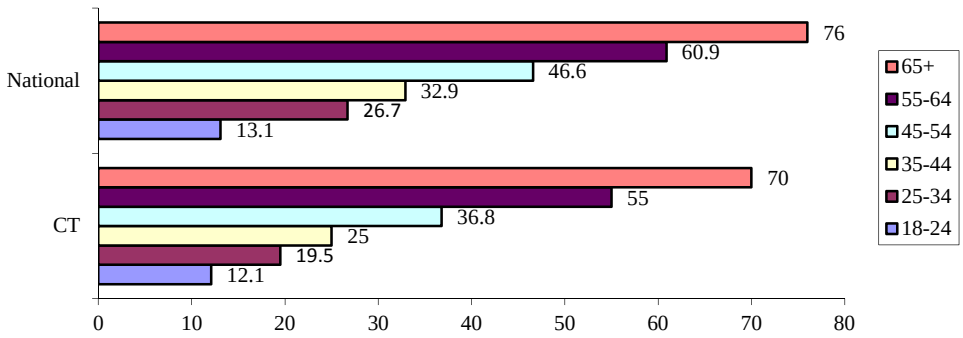
A full, adult dentition is defined as having 28 natural teeth, excluding the third molars (also known as wisdom teeth) and teeth extracted for orthodontic treatment or lost as a result of traumatic injury. With adequate personal and professional preventive practices, most individuals can keep their teeth for life. The most common reasons for tooth loss in adults are advanced tooth decay and periodontal (gum) disease.

Figure 3 B-2: Percentage of adults that have had any permanent teeth extracted by Race/Ethnicity, CT and National, 2008 and 2010



Healthy People 2020 objective OH-4 was to reduce the proportion of adults who have ever had a permanent tooth extracted because of dental caries of periodontal disease, with a target of 68.8%.[4] According to the 2010 Behavioral Risk Factor Surveillance System (BRFSS) data, 37.8% of CT adults and 43% of adults nationally have never had a tooth extracted because of dental caries or periodontal disease.[5] Overall, this objective has been met. When we examine this data more closely, we note racial disparities for this variable. Non-Hispanic blacks are more likely than other racial or ethnic groups to have had a tooth extracted due to dental caries or periodontal disease (see figures 3B-2). When this data is examined for age, there is a clear and expected downward trend (see figures 3B-3). The data also reveals that for adults over the age of 55 years, there is a clear and expected upward trend. For adults over the age of 65 years, rates for this measure are above the *Healthy People 2020* target. The mean number of natural, permanent teeth among American dentate adults increased significantly from 24 teeth between 1988-1994 to 25 teeth between 1999-2004.[2] This significant increase was seen across all age groups regardless of race, ethnicity, gender, income, or educational level.

Figure 3 B-3:Adults that have had any permanent teeth extracted by Age, CT and National, 2010



Edentulism

Good oral health, like good health in general, is the product of a complex set of interacting variables including personal care regimens, regular and continuous access to professional care, patient compliance with recommended treatment plans, etc. Edentulism refers to the complete lack of natural teeth. When this condition is the result of significant dental disease it represents a complete breakdown of prevention-based oral health care. Edentulism as a statistical measure therefore may be viewed as a summary variable for a person's total experience over their lifetime. In the U.S., rates of edentulism among adults 20-64 years decreased significantly between 1988-1994 and 1999-2004. Rates of edentulism are highest among current smokers, those with less than a high school education, and those with income less than FPL. Edentulism rates among adults age 50-64 years experienced the only significant decline.[2]

Measures of Periodontal Disease

Periodontal disease is a progressive infection of the gums which left untreated can lead to tooth and bone loss. The full-mouth examination is generally considered as a gold standard for periodontal disease assessment, which included measurement of attachment loss and probing depth at six sites per tooth for all teeth (except third molars).

According to 2009-2010 NHANES data, the prevalence of periodontitis in adults aged 30 or older was 47.2% in the U.S.[10] This equals 64.7 million adults over age 30. Total prevalence of periodontitis ranged from 24.4% in adults aged 30-34yrs to 70.1% in adults aged 65 years and older. Approximately 30% of the U.S. adult population are also likely to have moderate periodontitis (defined as two or more interproximal sites with greater than or equal to 4 millimeters of clinical attachment loss, or two or more interproximal sites with pocket depth greater than or equal to 5 millimeters).

The prevalence of periodontitis was significantly higher in males than in females, highest among Mexican Americans compared with all other racial and ethnic groups studied, highest among persons with lowest educational status, increased with increasing poverty levels, and highest among current smokers.

Healthy People 2020 Objective OH-5 sought to reduce the proportion of adults aged 45-74 years with moderate or severe periodontitis. A significant reduction in this measure was observed between 1988-1994 and 1999-2004 (22% and 16% respectively).[2] Connecticut does not have state-specific data for periodontal disease among adults and hence only national data is presented here.

C. The Prevalence of Disease and Unmet Need- Older Adults

In 2012, older adults (≥65 years of age) accounted for nearly 14.8% of CT's population and 13.7% of the U.S. population.[6] It is estimated that by 2050, the population of older adults in the US will reach 88.5 million, representing 20% of the population.[7]

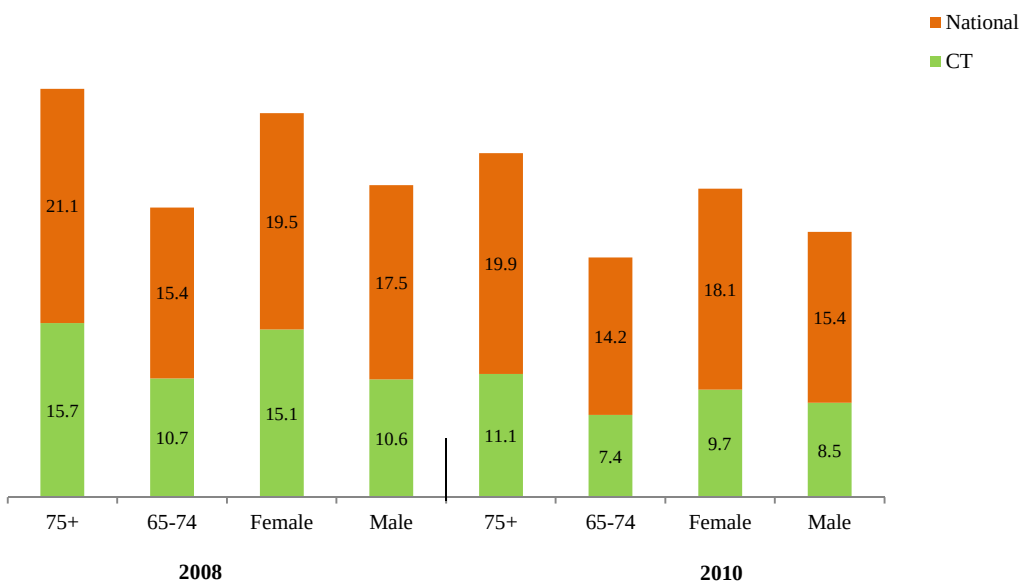
Older adults may face increased barriers to good oral health including a high incidence of chronic diseases, limited income, and limited access to care due to transportation issues. According to the 2008 American Community Survey, 1.6 million, or 4% of older adults lived in skilled nursing

facilities.[8] Approximately 80% of older Americans have at least one chronic condition, and at least 50% have two or more.[9]

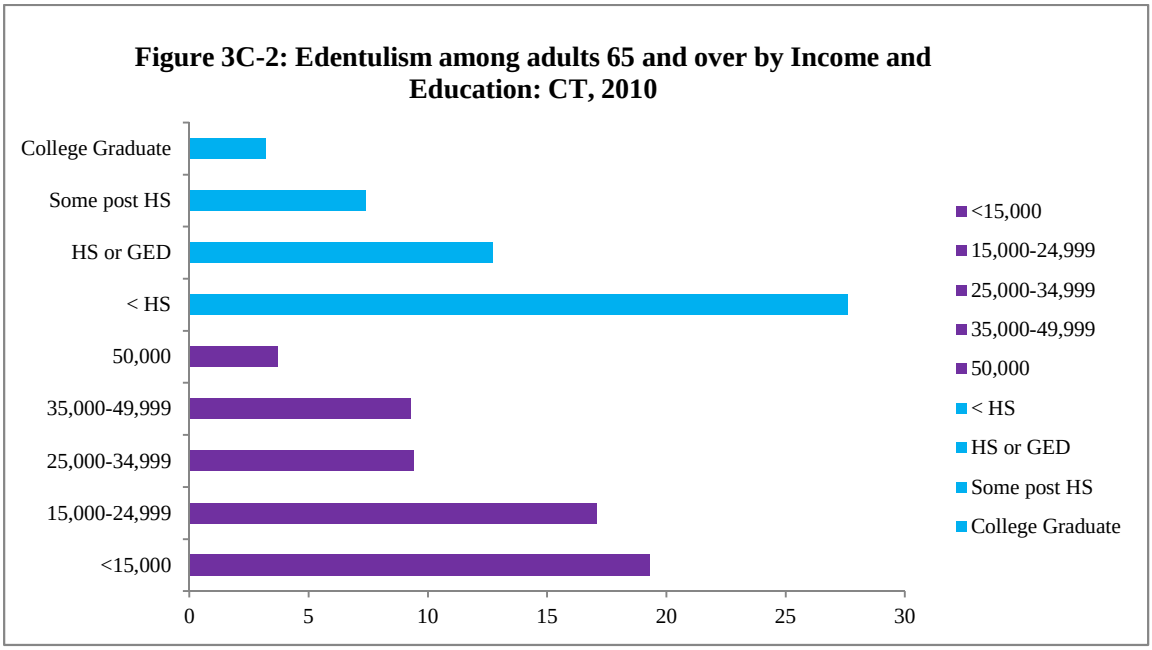
On the national level, 93% of older adults have experienced dental caries. No significant improvements were made between 1988 and 2004.[2] According to NHANES data, untreated dental caries among adults aged 65 and over did not change significantly between 1999-2004 and 2005-2008 (20% in 2008 versus 18% in 2004), with similar findings for edentulism (23% versus 27%). Prevalence of periodontal disease among adults aged 65 and over has significantly increased between 1999-2004 and 2009-2010. Periodontal disease increased from 11% to 70.1% and moderate to severe periodontitis increased from 17% to 64%.[11] This increase is attributed to change in oral examination protocol to full-mouth periodontal examination from partial mouth periodontal examination.[10]

Connecticut has limited data on the oral health status of older adults. According to data collected as part of the 2010 BRFSS, only 9.2% of CT's older adults have had all of their natural teeth removed compared to the national rate of 17% (see figure 3C-1).[5] Connecticut ranked first among the states for this measure.

Figure 3C-1: Edentulism among adults 65 and over by gender and age, CT and US, 2008 and 2010



When we examine this data more closely however, we note a marked difference for this measure between older adults aged 65-74 years and those aged 75 years and older. In addition, we observe marked disparities in the rate of total tooth loss by income, and educational attainment (see figure 3C-2).



The oral health of older adults and the unique challenges faced by this population has not been overlooked. Connecticut has an active and engaged *Taskforce on Oral Health for Older Adults* that was formed in 2006. The taskforce has met on a regular basis and developed a strategic document entitled *Just the F.A.C.T.S.: Strategies to improve oral health for older adults in Connecticut* (released January 2008) as well as a detailed action plan published in 2010.

In addition, in July of 2010, CT served as a pilot site for the Association of State and Territorial Dental Director's Basic Screening Survey (BSS) for Older Adults. It is anticipated that CT will conduct a full-scale BSS for older adults in the near future.

Special Topic C-i: Oral Cancer

Description

Cancer of the oral cavity and pharynx includes cancers that develop in any part of the oral cavity including the tongue, salivary glands, floor of the mouth, nasopharynx and hypopharynx. Early signs and symptoms of oral cancer may include: a sore in the throat or mouth that bleeds easily or does not heal, a persistent white or red patch of tissue, a lump or thickening of the tissue, a mass in the neck, ear pain, and coughing up blood. Later stages of the disease may be characterized by difficulty chewing, swallowing, or moving the tongue or jaws.[1]

Risk Factors

Cigarette smoking and drinking alcohol are the major known risk factors for oral cancer in the U.S., accounting for more than 75% of these cancers.[2] A number of studies have indicated a synergism between tobacco and alcohol use, resulting in a thirty-fold increased risk among individuals who smoke and drink alcohol in excess.[2] The use of tobacco, including smokeless tobacco[3-4] and cigars[5] also increases the risk of oral cancer. Dietary factors, particularly low consumption of fruit, and some types of inherited conditions such as Fanconi anemia have been

implicated as risk factors for oral cancer.[6-11] Radiation from sun exposure is a risk factor for lip cancer.[12] Human papillomavirus (HPV) is a risk factor for cancer of the base of the tongue and the tonsils, though evidence suggests that HPV-related carcinomas have a better prognosis overall compared to non-HPV-related carcinomas.[13-15]

SEER Program/Connecticut Tumor Registry

The Connecticut Tumor Registry (CTR) is part of the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program (seer.cancer.gov/), and collects data on all cancers diagnosed in CT residents from 1935 to the present. Information collected includes: patient demographics, primary tumor site, tumor morphology and stage at diagnosis, and follow-up for vital status. The registry is also one of the only five statewide designated sites in the country. Data collected by the CTR are submitted to the NCI and other organizations. This information contributes to national surveillance data on cancer incidence, survival and prevalence. All hospitals, clinical laboratories, and health care providers in CT are required by law to report cancer cases to the CTR.[16]

Incidence

Oropharyngeal cancer is the eleventh most common cancer worldwide for both genders and the eighth most common cancer worldwide among men.[17] Cancer of the oral cavity or pharynx (oral cancer) is the eighth most common cancer in African American men and the ninth most common cancer in White men in the U.S.[18] It is estimated that there will be approximately 41,380 new cases of oropharyngeal cancers diagnosed in the U.S. in 2013 (29,620 in men and 11,760 in women), and 7,890 deaths (5,500 men and 2,390 women) due to oropharyngeal cancers .[18]

From 2006-2010 in the U.S., the age-adjusted incidence rate for cancer of the oral cavity and pharynx was 10.8 per 100,000 men and women per year.[18] Nearly 90% of cases of oral cancer in the U.S. occur among persons aged 45 years and older. The age-adjusted incidence was more than twice as high among men (16.2) than among women (6.2), as was the mortality rate (3.8 vs 1.4).[18]

Examination of U.S. incidence data for oropharyngeal cancer reveals that men develop the disease at a rate twice that of women; blacks develop the disease slightly more often than whites. Incidence of oropharyngeal cancers has been declining during the past thirty years, a trend also observed for oropharyngeal cancer deaths.[1] Nationally, for both males and females of all races the incidence for cancer of oral cavity and pharynx slightly increased by 0.4% between 2003 and 2010.[18] The increase in overall incidence rate of oral and pharyngeal cancers is primarily due to an increase in the incidence rate of three sub-types (tongue, oropharynx, and tonsil).[18] Based on national rates from 2008-2010, 1.09% of men and women will be diagnosed with cancer of the oral cavity and pharynx during their lifetime.[18]

In 2010, 435 CT residents were diagnosed with cancer of the oral cavity and pharynx, and 74 deaths were attributed to oral cancers.[19-20] The tongue was the most frequent site of oral cancers reported in 2010 among CT residents (see Table 3C-1).[19] The age-adjusted incidence rates for CT for 2010 have been compared with National rates. Overall CT incidence rates are comparable to National rates (see Table 3C-2).[19] Similar to national statistics, cancer of the oral cavity and pharynx is diagnosed in CT more frequently among males than females. According to 2006-2010

national data, the rates of oral cancer among blacks and whites are converging. CT rates, however, indicate that this disparity remains within the state.[19]

Table 3C-1: Incidence and Mortality of Cancer of the Oral Cavity and Pharynx by Site 2010		
Connecticut 2010		
	Incidence	Mortality*
Oral Cavity & Pharynx	435	109
Lip	14	<1
Tongue	154	38
Salivary Gland	45	17
Floor of Mouth	28	<1
Gum and Other Mouth	62	19
Nasopharynx	8	10
Tonsil	71	<10
Oropharynx	17	<10
Hypopharynx	31	<10
Other Oral cavity & Pharynx	5	10

*counts suppressed for fewer than10 deaths

Treatment/Survival

Treatment for oral cancer involves radiation therapy and surgery, separately or in combination. In advanced disease, chemotherapy may be added.[1]

Five-year relative survival for cancers of oral cavity and pharynx has improved substantially over the past 30 years. The relative survival rate estimates the effect of cancer by comparing the survival of cancer patients to that of the general population. The 5-year relative survival for 2003-2009 was 62.2%, although survival varies widely by stage of disease when diagnosed. During the same time period the 5-year relative survival rate for persons with oral cancer diagnosed at a localized stage was 82.7%. In contrast, the 5-year survival rate is only 59.2% once the cancer has spread to regional lymph nodes at the time of diagnosis and is just 36.3% for persons with distant metastasis. The five-year survival rate is related to the site of the cancer.

Table 3C-2: Age-Adjusted Cancer Incidence Rates, 2010 Oral Cavity and Pharynx (C00-C14)				
	US (SEER+NPCR)*		Connecticut	
	Average Cases per Year	Annual Incidence Rate	Average Cases per Year**	Annual Incidence Rate
Male				
All Races	25,706^	16.0	298	15.3
White	22,125	16.2	271	15.6
Black	2,322	14.1	20	12.2
Female				
All Races	11,001	6.1	137	6.0
White	9,330	6.1	116	5.6
Black	1,063	5.1	<16	**

* Source: CDC's National Program of Cancer Registries Cancer Surveillance System (NPCR-CSS) January 2013 data submission and SEER November 2012 submission.
** counts suppressed for fewer than 16 cases
^ The total count for the US (SEER+NPCR) may differ from the summation of the individual states reported in this table. The total uses data from the CDC's National Program of Cancer Registries Cancer Surveillance System (NPCR-CSS) January 2013 data submission for the following states: California, Kentucky, Louisiana, and New Jersey but data for those states when shown individually are sourced from the SEER November 2012 submission.
Source: *http://statecancerprofiles.cancer.gov*

Mortality

Oral and pharyngeal cancer mortality rates for 2006-2010 are found in Table 3C-3 for the U.S. and CT. The mortality rates in CT are generally similar to that found in the other SEER registries. The age-adjusted death rate was 2.5 per 100,000 men and women per year, these rates are based on patients who died in 2006-2010 in the U.S.[18]

Table 3C-3: Age-Adjusted Cancer Mortality Rates, 2010 Oral Cavity and Pharynx (C00-C14)				
	US		Connecticut	
	Average Deaths per Year	Annual Death Rate	Average Deaths per Year**	Annual Death Rate
Male				
All Races	**5,815**	**3.8**	**79**	**4.0**
White	**4,885**	**3.7**	**72**	**4.1**
Black	**727**	**4.8**	**<10**	****
Female				
All Races	**2,659**	**1.4**	**30**	**1.2**
White	**2,266**	**1.4**	**28**	**1.2**
Black	**279**	**1.4**	**<10**	****

** counts suppressed for fewer than 10 deaths
Source: *http://statecancerprofiles.cancer.gov*

D. Disparities

Race and Ethnic Groups

Although gains in oral health status have been achieved for the population as a whole, they have not been evenly distributed across subpopulations. Non-Hispanic blacks, Hispanics, and American Indians and Alaska Natives generally have the poorest oral health of any of the racial and ethnic groups in the U.S. As reported above, these groups tend to be more likely than non-Hispanic whites to experience dental caries in some age groups, are less likely to have received treatment for it, and have more extensive tooth loss. African American adults in each age group are more likely than other racial/ethnic groups to have gum disease. Compared with white Americans, African Americans are more likely to develop oral or pharyngeal cancer, are less likely to have it diagnosed at early stages, and experience a worse 5-year survival rate.

Women's Health

Most oral diseases and conditions are complex and are the product of interactions between genetic, socioeconomic, behavioral, environmental, and general health influences. Multiple factors may act synergistically to place some women at higher risk of oral diseases. For example, the comparative longevity of women, compromised physical status over time, and the combined effects of multiple chronic conditions and side effects from multiple medications used to treat them can result in increased risk of oral disease.[1]

Many women live in poverty, are not insured, and are the sole head of their household. For these women, obtaining needed oral health care may be difficult. In addition, gender-role expectations of women may affect their interaction with dental care providers and could affect treatment recommendations as well.

Many statistical indicators show women to have better oral health status than do men.[1,2] Women are less likely than men at each age group to have severe periodontal disease. Both African American and white women have a substantially lower incidence rate of oral and pharyngeal cancers than do African American and white men, respectively. However, a higher proportion of women than men have oral-facial pain, including pain from oral sores, jaw joints, face/cheek, and burning mouth syndrome.

People with Disabilities

The oral health problems of individuals with disabilities are complex. These problems may be due to underlying congenital anomalies as well as to inability to receive the personal and professional health care needed to maintain oral health. In 2010, approximately 56.7 million people are defined as disabled under the Americans with Disabilities Act, including 12.3 million children aged 6 years and older and 4.5 million children between 6 and 14 years of age.[4]

No national studies have been conducted to determine the prevalence of oral and craniofacial diseases among the various populations with disabilities. Several smaller-scale studies show that the population with intellectual or other developmental disabilities has significantly higher rates of poor oral hygiene and needs for periodontal disease treatment than the general population, due, in part, to limitations in individual understanding of and physical ability to perform personal prevention practices or to obtain needed services. Caries rates among people with disabilities vary widely but overall, their caries rates are higher than those of people without disabilities.[2]

Socioeconomic Disparities

People living in low-income families bear a disproportionate burden from oral diseases and conditions. Despite progress in reducing dental caries in the U.S., children and adolescents in families living below the poverty level experience more dental decay than do children who are economically better off. Furthermore, the caries seen in individuals of all ages from poor families is more likely to be untreated than caries in those living above the poverty level. Approximately one in four children aged 3-5 and 6-9 years living at or below 100% of the federal poverty level have untreated dental decay, compared with children living above the poverty level.[5] For adolescents, the difference in the prevalence of untreated caries was not statistically significant between the two income groups.

Prevalence of untreated caries was significantly higher for adults living below 100% of the federal poverty level compared with those living at the 200% level or higher.[6] At every age, a higher proportion of those at the lowest income level than at higher income levels have periodontitis. Similarly, the prevalence of periodontal disease was almost twice higher among adults with less than high school (66.9%) or with high school (53.5%) education than do adults with education above high school (39.3%).[7] More than one-third of older adults aged 65–74 living below the federal poverty level (34%) were edentulous, whereas approximately one-eighth of older adults living above the poverty level (13%) were edentulous.[6] Among persons 65 years and older, 39% of persons with less than a high school education were edentulous in 1997, compared with 13% of persons with at least some college.[3] People living in rural areas also have a higher disease burden because of difficulties in accessing preventive and treatment services.

E. Societal Impact of Oral Disease

i. Social Impact

Oral health is related to well-being and quality of life as measured along functional, psychosocial, and economic dimensions. Diet, nutrition, sleep, psychological status, social interaction, school, and work are affected by impaired oral and craniofacial health. Oral and craniofacial diseases and

conditions contribute to compromised ability to bite, chew, and swallow foods; limitations in food selection; and poor nutrition. These conditions include tooth loss, diminished salivary functions, oral-facial pain conditions such as temporomandibular disorders, alterations in taste, and functional limitations of prosthetic replacements. Oral-facial pain is a major source of diminished quality of life. It is associated with sleep deprivation, depression, and multiple adverse psychosocial outcomes.

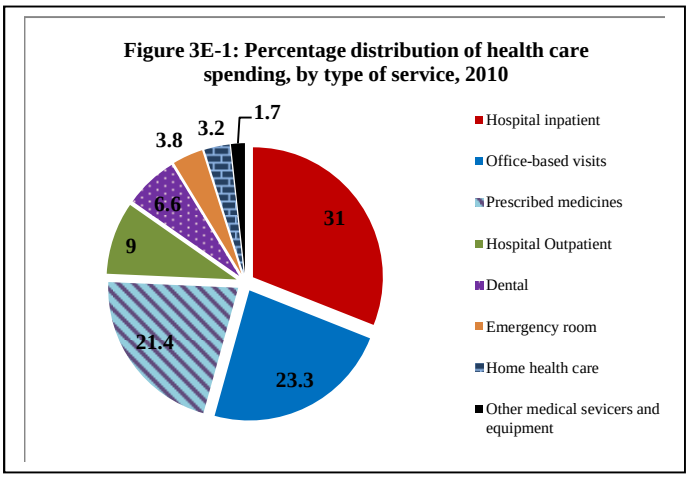
More than any other body part, the face bears the stamp of individual identity. Attractiveness has an important effect on psychological development and social relationships. Considering the importance of the mouth and teeth in verbal and nonverbal communication, diseases that disrupt their functions are likely to damage self-image and alter the ability to sustain and build social relationships. The social functions of individuals encompass a variety of roles, from intimate interpersonal contacts to participation in social or community activities, including employment. Dental diseases and disorders can interfere with these social roles at any or all levels. Perhaps due to social embarrassment or functional problems, people with oral conditions may avoid conversation, laughing, smiling, or other nonverbal expressions that show their mouth and teeth.

ii. Economic Impact

Direct Costs

Utilization- National Expenditures

According to the 2010 MEPS conducted by the Agency for Healthcare Research and Quality (AHRQ), 84.6% of the U.S. population (about 261.1 million persons) had some expenses for hospital inpatient and outpatient care, emergency room services, office-based medical provider services, dental services, home health care, prescribed medicines, and/or other medical services and equipment. A total of $1.263 trillion was spent on healthcare in 2010, 6.6% of which was spent on dental services (see figure 3E-1). The mean cost per person for dental expenses was $666, the median cost per person was $236. The difference between the mean and median is because a relatively small proportion of individuals accounted for a large proportion of the expense.[1] Dental expenses accounted for 6.6% of overall expenses, but ranged from 3.5% for persons age 65 and older to 17.8% for children under age 18.[1]



Indirect Costs

Oral and craniofacial diseases and their treatment place a burden on society in the form of lost days and years of productive work. In 1996, the most recent year for which national data are available, U.S. schoolchildren missed a total of 1.6 million days of school as a result of acute dental conditions. That is more than 3 days for every 100 students.[2] Acute dental conditions were

responsible for more than 2.4 million days of work loss and contributed to a range of problems for employed adults, including restricted activity and bed days. In addition, conditions such as oral and pharyngeal cancers contribute to premature death and can be measured by years of life lost.

iii. Oral Disease and other Health Conditions

Systemic Health and Periodontal Disease

Periodontal disease has been associated with diabetes, cardiovascular disease, and preterm low birth weight.[2,3,4,5]

Diabetes

In CT, 7.3% of the adult population has been diagnosed with diabetes.[6] A greater number remain at-risk for diabetes or are undiagnosed. Periodontal disease can cause a release of bacteria into the blood stream (bacteremia) leading to an increase in blood sugar. This could make diabetes more difficult to control and increase the risk for diabetes complications.[3] Conversely, diabetes, if left uncontrolled, may result in periodontal disease, significant bone loss around the teeth, and tooth loss. About fifty-nine percent of diabetics in CT reported tooth loss in the 2010 CTBRFSS.[6]

Cardiovascular Disease

Cardiovascular disease (CVD) is the number one cause of morbidity and mortality in CT, accounting for 42% of annual deaths and 23% of hospitalizations. Known risk factors for CVD only explain about two-thirds of all cases. Systemic periodontal infection has been linked to CVD, but further research is needed to determine if a true etiologic relationship exists.

Pre-term birth and low-birth weight infants

Pre-term birth and low-birth weight are considered the leading perinatal complications in the U.S. Pre-term births (before 37 weeks gestation) account for 6-9% of all births.[7] Pre-term and low birth-weight babies may face serious health issues and are at a higher risk of long-term disabilities. Despite widespread use of drugs to arrest pre-term labor, there has been no decrease in the incidence of low birth-weight or preterm infants in the past 30 years. It is estimated that over 25% of pre-term, low birth-weight infants occur without any known risk factors.[8]

In 2010, there were 37,713 live births in CT. Of these, 3,220 (8.0%) were low birth-weight and 3,018 (10.4%) were pre-term.[9] The average total cost in 2004 to care for a low birth-weight baby was $48,125. This average increased from $31,092 in 2000 and represents an annual expenditure of over $132 million in CT.[10] This number does not include the healthcare costs beyond the initial hospitalization or for treatment of disabilities with life-long implications.[8]

Recent research has demonstrated maternal periodontal disease increases the relative risk for preterm or spontaneous preterm births,[11,12] and that pregnant women with periodontal disease are 7 times more likely to give birth to low-birth weight infants.[13]

Of additional concern is the presence of periodontal disease in a pregnant woman with preeclampsia. Preeclampsia is a disorder that occurs only during pregnancy and the postpartum period and may affect both the mother and the unborn baby. Affecting at least 5-8% of all pregnancies in the state , it is a rapidly progressive condition characterized by high blood pressure and the presence of protein in the urine.[14] Results from a 2002 study suggest that mothers with preeclampsia may be at greater risk for preterm delivery if periodontal disease is present early in the pregnancy or has progressed during pregnancy.[15] Other studies have shown that mothers with preeclampsia who were treated for periodontal disease during pregnancy were less likely to give birth prematurely to low-birth-weight babies.[16]

While these studies suggest that there is a link between the presence of periodontal disease during pregnancy and low-birth-weight or preterm birth outcomes, to date there has not been conclusive evidence that it is a direct causal effect. A study of pregnant women published in 2006 found that while periodontal disease treatment was effective at reducing this oral disease it did not significantly affect the rate of pre-term or low birth weights.[17] Further study is needed to determine a definitive cause, but, if the connection can be made, periodontal disease is a potentially modifying factor that can be treated and managed to improve overall health and reduce healthcare costs.

Section 4. Risk and Protective Factors Affecting Oral Diseases

The most common oral diseases and conditions can be prevented. Safe and effective measures are available to reduce the incidence of oral disease, reduce disparities, and increase quality of life.

A. Community Water Fluoridation

Community water fluoridation is the process of adjusting the natural fluoride concentration of a community's water supply to a level that is best for the prevention of dental caries. In the U.S., community water fluoridation has been the basis for the primary prevention of dental caries for 65 years and has been recognized as one of 10 great achievements in public health of the 20th century.[1] It is an ideal public health method because it is effective, eminently safe, inexpensive, requires no behavior change by individuals, and does not depend on access or availability of professional services. Water fluoridation is equally effective in preventing dental caries among different socioeconomic, racial, and ethnic groups. Fluoridation helps to lower the cost of dental care and helps residents retain their teeth throughout life.[2,9,10,11]

Recognizing the importance of community water fluoridation, the *Healthy People 2020* Objective OH-13 is to "Increase the proportion of the U.S. population served by community water systems with optimally fluoridated water to 79.6 percent."[3] In the U.S. during 2010, approximately 204 million persons (66.2% of the population served by public water systems) received optimally fluoridated water.[4]

Water fluoridation can reduce the amount of decay in children's teeth by as much as 60%. When used in combination with fluoride toothpaste, mouth rinses, and professionally-applied fluoride treatments (including gels, foams, and varnishes), fluoridation can reduce tooth decay by 18-40% in children and nearly 35% in adults.[5]

Not only does community water fluoridation effectively prevent dental caries, it is one of very few public health prevention measures that offers significant cost savings to almost all communities. It has been estimated that about every $1 invested in community water fluoridation saves approximately $38 in averted costs.[6] The cost per person of instituting and maintaining a water fluoridation program in a community decreases with increasing population size.

Fluoride is present in small but widely varying amounts in practically all soils, water supplies, plants, animals, and thus is a normal constituent of all diets. All public water supplies in this country contain at least trace amounts of natural fluoride.

Strong evidence now exists that water fluoridation aids in the re-mineralization of the tooth, actually reversing the decay process after it already has begun. In addition, fluoride may also make teeth more resistant to bacterial acids and inhibit the growth of certain kinds of bacteria that produce these acids. However, excessive fluoride consumption can cause mottled enamel or fluorosis (i.e. whitish or brownish spots on teeth). Dental fluorosis results from the ingestion of high levels of fluoride during tooth development in children less than 8 years old. Some people who drink water that contains fluoride in excess of the 4.0 milligrams per liter (mg/l) recommended maximum containment level on a regular basis over many years may develop skeletal fluorosis than can cause pain and tenderness in the bones.

Connecticut general statute {19a-38} requires that all public water systems serving at least 20,000 persons adjust the fluoride to maintain optimal fluoride content between 0.8 mg/l and 1.2 mg/l.[7] According to 2009 data, there are a total of about 600 community water systems in CT that serve approximately 84% of state's total population. Of these systems 554 (92.3%) are optimally fluoridated that serve 91 % of Connecticut's population of 3.4 million.[8] Connecticut has exceeded the Healthy People 2020 goal of 79.6%.

B. Dental Sealants

Approximately 90% of tooth decay in children's permanent teeth occurs on tooth surfaces with pits and fissures.[1] Dental sealants are thin, plastic coatings applied to the pits and fissures on the chewing surfaces of molars to prevent tooth decay by creating a physical barrier against bacterial biofilms (plaque) and food.[2] Dental sealants have been recognized as an effective, evidence-based prevention strategy for caries reduction in children and adolescents by a number of professional health associations and public health agencies.[3-7]

The efficacy of dental sealants varies over time, largely as a function of sealant retention. Sealant retention rates range from 74.0-96.3% at one year and 70.6-76.5% at 2.8 years post-placement.[8] Dental sealants have been shown to reduce the incidence of caries in children and adolescents by 86% at one year post-placement, 78.6% at two years, and 58.6% at four years post-placement.[8] Sealant efficacy can be increased when re-applied as necessary.[9]

The *Healthy People 2020* target for dental sealants on molars is 28.1% for 6-9 year-olds and 21.9% for 13-15 year-olds.[10] On the national level, there was no significant change in the proportion of children who had received dental sealants on their molar teeth between 1999-2004 and 2000-2010.[11]

According to 2009-2010 NHANES data, 32% of 6 to 9-year-olds and 51% of adolescents aged 13 to 15-year-olds had at least one sealant on a permanent tooth (see Table 4B-1).[11] Nationally, the mean number of permanent teeth with dental sealants among children 6-11 years old did not increase between 1988-1994 and 1999-2004. In 1999-2004, 6-11 year-olds with at least one dental sealant had a mean 3.38 permanent teeth with dental sealants (see Table 4B-2).[12]

Table 4B-1: Prevalence of dental sealants on permanent teeth among children and adolescents, by selected characteristics: United States, National Health and Nutrition Examination Survey, 1999-2004 and 2009-2010.

	1999-2004	2009-2010	Difference
6-8 yr. olds	20.28%	32%	11.72%
9-11 yr. olds	40.12%	51%	10.88%

In CT, prevalence of dental sealants among third-grade students was measured during the 2010-2011 academic year as part of a Basic Screening Survey entitled "Every Smile Counts." Data collected on 4,339 students found that 42.6% CT third-graders had sealants, significantly higher than the national estimate of 20.28%. This meets the Healthy People 2020 target of 28.1%.[13]

Table 4B-2: Mean number of permanent teeth with dental sealant among youths 6-11 years of age with at least one sealed tooth, by selected characteristics: United States, National Health and Nutrition Survey, 1998-1994 and 1999-2004.

	1988-1994	1999-2004	Difference
6-8 yr. olds	3.22	3.37	0.15
9-11 yr. olds	3.54	3.39	-0.15
Total	3.38	3.38	0.00

Source: Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G, et. al. Trends in oral health status: United States, 1988-1994 and 1999-2004. National Center for Health Statistics. Vital Health Stat 11 (248). 2007.

Table 4B-3: Percentage of Connecticut Third Grade Students with at least one dental sealant, by Race/Ethnicity, Every Smile Counts, 2011.

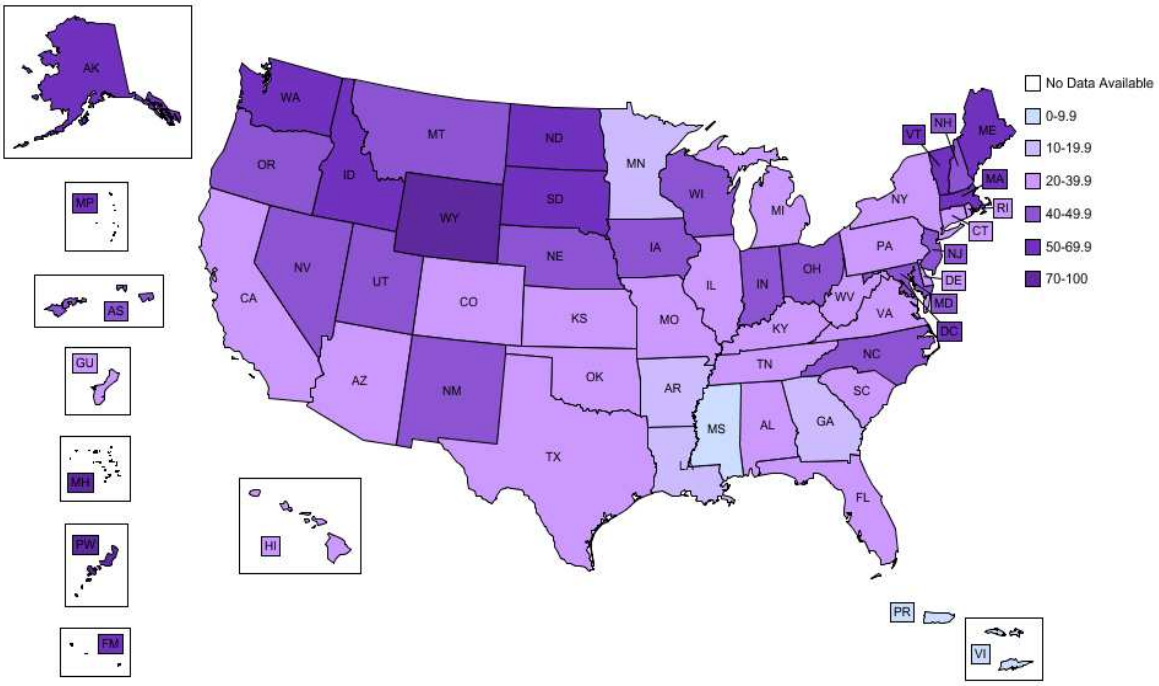
	Number	Percentage
Overall	4,339	42.6%
White, Non-Hispanic	2,708	41.9%
African-American	524	34.9%
Hispanic	790	48.7%

Source: Connecticut Department of Public Health: Office of Oral Health. Every Smile Counts, 2011: The Oral Health of Connecticut's Children. Hartford, CT, October 2012.

In CT, African American third-graders were significantly less likely to have received dental sealants than their White non-Hispanic peers (34.9% vs 41.9% respectively) (see Table 4B-3).[13] The percentage of students with dental sealants did not differ significantly with respect to the number of students enrolled in the school who were eligible for Free/Reduced Lunch (a proxy for the income status of enrolled students' families).[13]

Figure 4B-1: Prevalence of dental sealants among third graders by Race/ Ethnicity and percent on FRL, CT, 2010

Figure 4B-2: Percent of 3rd grade students with at least one dental sealant



Data Source: Maternal and Child Health Bureau Title V Block Grant 2009 Application Data.
Data are for the most recent year reported/available. In most cases the data represents 2007 data.

Dental sealant placement rates among CT's Medicaid (HUSKY A) population increased between 2008 and 2010 (see table 4B-4), with the highest sealant placement rates of 32.4% and 33.3% among children aged 9 to 11 and 12 to 14 respectively.[14]

Table 4B-4: Dental sealant placement rates for children enrolled in HUSKY A, 2010.

	2008	2009	2010
Percent of children 3-19 who had at least one sealant placed	17.6%	22.9%	22.1%

Data Source: Children's Dental Services in the HUSKY Program: Program Improvements Led to Increased Utilization in 2009 and 2010

C. Preventive Visits

Maintaining good oral health requires consistent effort on the part of the individual, caregivers, and healthcare providers. Daily oral hygiene routines and healthy lifestyle behaviors play an important role in preventing oral disease. Regular preventive dental care can reduce the likelihood of developing oral disease and facilitate early diagnosis and treatment. Routine dental visits are an effective means of early disease detection, providing preventive education, initiating interventions, and reducing the overall cost of care and morbidities associated with dental disease.

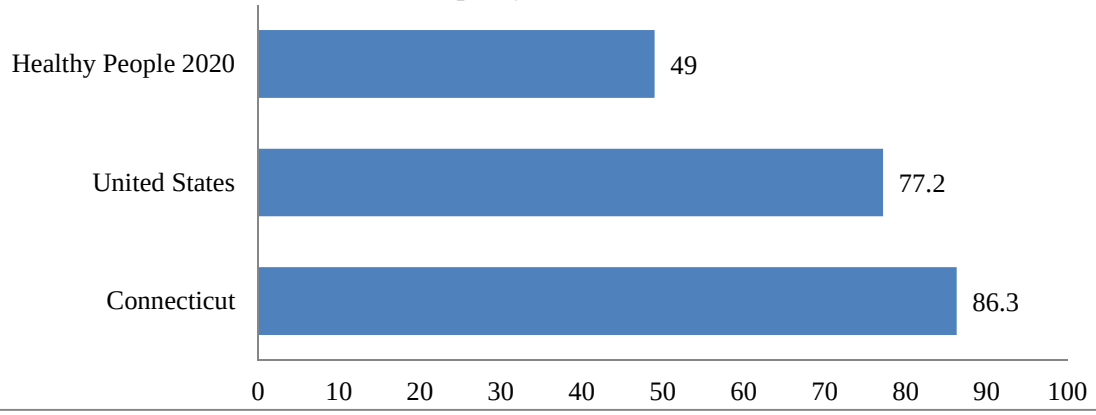
Oral Health in Connecticut

The American Academy of Pediatric Dentistry (AAPD) and the American Dental Association recommend that patients seek regular dental care beginning at the time of the eruption of the first tooth and no later than 12 months of age.[1,2]

Utilization-Children

Healthy People 2020 objective OH-7 sought to increase the proportion of children, adolescent and adults who used the oral health care system in the past year with a target of 49.0%.[3] According to the 2011/2012 National Survey of Children's Health (NSCH), 86.3% of CT children between the ages of 1 and 17 had one or more preventive dental care visits within the past 12 months. This number was slightly higher than the national rate of 77.2% (see figure 4C-1).[4] This data indicates that this Healthy People 2020 measure had been met on both the state and national level. Breakdown of CT data from the NSCH by age indicates 68.6 % of children ages 0-5 years old had a preventive dental visit in the past year which is significantly lower than children 6-11 year olds (94.1%) and 12-17 year olds (91.0%), racial/ethnic background, etc. did not reveal significant differences between subgroups.

Figure 4C-1 Percentage of CT and US Children ages 1-17 with a preventive dental visit in the past year 2011/2012 NSCH data

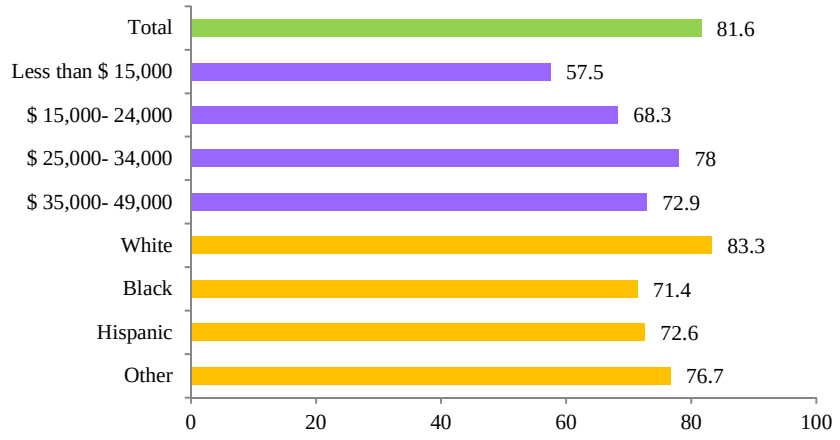


Utilization-Adults

According to 2010 BRFSS data, 81.6% of CT adults, and 69.6% of adults nationwide over the age of 18 have had a dental visit, for any reason, within the past year.[5] State and national data indicate that utilization rates are well-above the Healthy People 2020 target of 49%. For this measure, the disparities based on age and gender were small, there was however a distinct trend in utilization in relationship to income and race and ethnicity. (see figures 4C-2).[5]

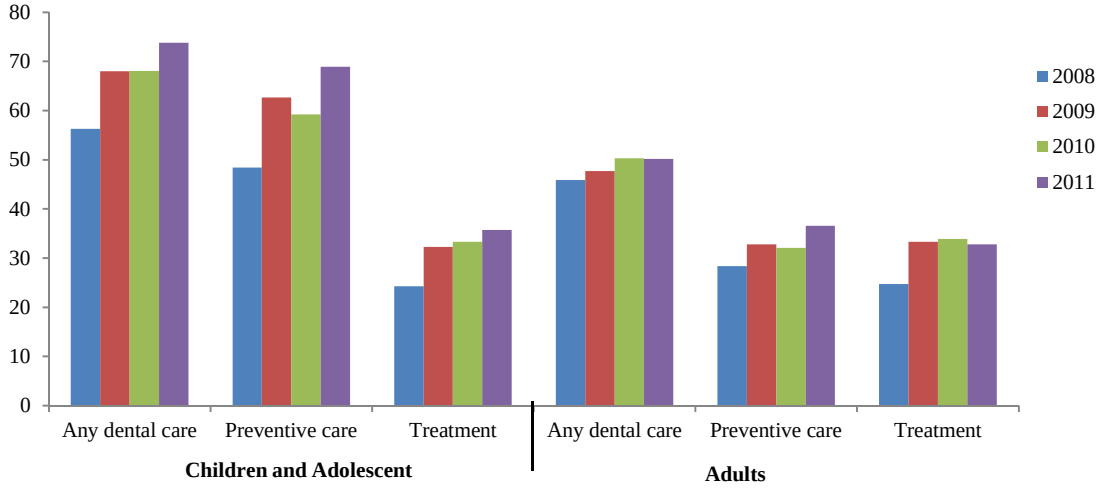
In CT, utilization of dental services among children and adults in the HUSKY Program has increased for the third consecutive year in 2011 since program reforms were implemented in 2008 (see figure 4C-3).[6]

Figure 4C-2 Percentage of CT adults aged 18 and over with a dental visit in the past year, by income, race, and ethnicity



Source: CDC BRFSS, 2010

Figure 4C-3 Percentage of Children, Adolescents, and Adults with Dental Services in HUSKY A, Connecticut 2008-2010



D. Screening for Oral Cancer

Oral cancer detection is accomplished by a thorough visual and tactile examination of the head and neck; an examination of the mouth including the tongue, the entire oral and pharyngeal mucosal tissues, the lips and palpation of the cervical lymph nodes. Although the sensitivity and specificity of the oral cancer examination have not been established in clinical studies, most experts consider early detection and treatment of precancerous lesions and diagnosis of oral cancer at localized stages to be the major approaches for secondary prevention of these cancers.[1-3] If suspicious tissues are detected during an examination, definitive diagnostic tests, such as biopsies, are needed to make a firm diagnosis.

Recommendations regarding the implementation of cancer screening protocols are developed by the U.S. Preventive Services Task Force. In the case of oral cancer, screening recommendations are also published by the American Dental Association Council on Scientific Affairs. Both of these organizations form their recommendations with the help of expert panels who review the scientific evidence to support various screening protocols. The findings of these two organizations conclude that "community-based" or "population-based" screening may identify cases of oral cancer at earlier stages of development; but, due in part to the low incidence of oral cancer in the U.S., there is insufficient evidence to support the notion that screening leads to improved health outcomes or reduced disease-specific mortality.[4-6]

In order for oral cancer screening to impact mortality, patients must receive confirmatory diagnosis, have access to treatment services, and comply with treatment regimens.[4] Evidence from the ongoing 2000 Kerala study suggests that a significant percentage of patients identified through screening do not pursue confirmatory testing and/or treatment.[4]

Healthy People 2010 Objective 21-7 is to increase the proportion of adults who, in the past 12 months, report having had an examination to detect oral and pharyngeal cancers.[7] This objective is developmental in *Healthy People 2020.* According to the 2008 National Health Interview Survey, 29.4% of adults over the age of 18 report *ever* having had an oral cancer examination. Adults age 40 and over were more likely to have had an oral cancer exam in their lifetime, but those at greatest risk (current smokers aged ≥ 40 years) were less likely than non-smokers or former-smokers to have had an oral cancer examination.[8] No state data on the frequency of oral and pharyngeal cancer screening is available at this time.

One of the primary objectives of oral cancer screening is the identification of disease at early stages. *Healthy People 2020* Objective OH-6 is to increase the proportion of oral and pharyngeal cancers detected at the earliest stage with a target of 35.8%.[9] According to the SEER registries, detection rates of oral cancer at the localized stage have improved though racial disparities remain (see table 4D-1). State and national data are approaching the *Health People 2020* target.

Table 4D-1: Detection rates for oral cancer identified at localized stage of disease

Database Level	2002-2006 detection rates at localized stage of disease		2006-2010 detection rates at localized stage of disease		*Healthy People 2020* Target
Other SEER registries (proxy for national data)	All Races	48.85%	All Races	46.10%	35.8%
	White	49.42%	White	46.47%	
	Black	33.76%	Black	30.76%	
Connecticut	All Races	44.96%	All Races	46.10%	35.8%
	White	45.09%	White	46.47%	
	Black	37.68%	Black	30.76%	

Data Source: US Department of Health and Human Services, Healthy People 2020

Section 5. Provision of Dental Services

A. Dental Workforce and Capacity

Dentists

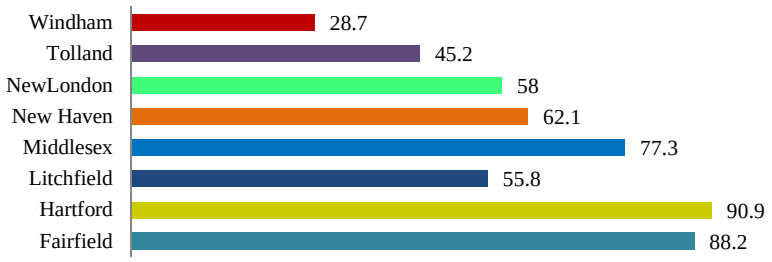
Information about CT's dentists can be gleaned from two primary sources, the U.S. Census and CT's provider licensing database.

The U.S. Census provides detailed information on licensed dentists living in CT, which allows for data analysis based on a number of variables including geographic distribution, racial and ethnic diversity, gender, age, and specialty. A significant drawback of this dataset, however, is the infrequency of data collection. Connecticut's provider licensing database offers continuously updated data but far less detailed information. Information from both of these datasets will be presented.

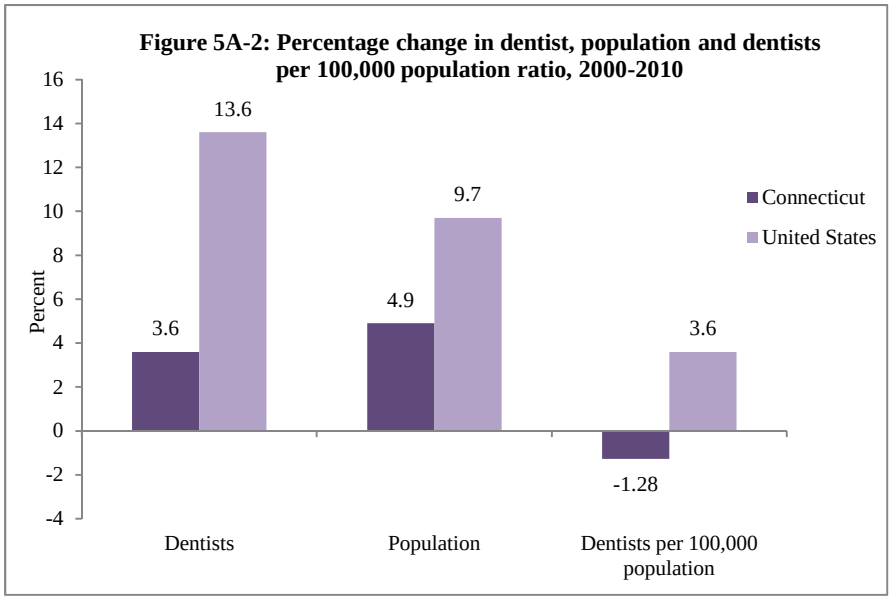
According to the 2011 American Dental Association Survey, there were 2,831 non-federal dentists licensed in the state of CT.[1] This is equivalent to 79.06 dentists per 100,000 population, significantly higher than the national rate of 62.04.[1]

The geographic distribution of dentists in CT according to 2010 U.S. Census data is depicted in Figure 5A-1. The ratio ranges from 28.7 dentists per 100,000 population in Windham County to 90.9 dentists per 100,000 population in Hartford County (see figure 5A-1).[2]

Figure 5A-1: Ratio Dentists: 100,000 Population by County, Connecticut, 2010



From 2000-2010, CT's population grew by 4.9% while the number of dentists increased by 3.6% resulting in a net loss of 1.28% in dentist to population ratio.[1] On a national level, the population grew by 9.7% while the number of dentists grew by 13.6% , yielding a net gain of 3.6% in the dentist to population ratio. (see figure 5A-2).[1]

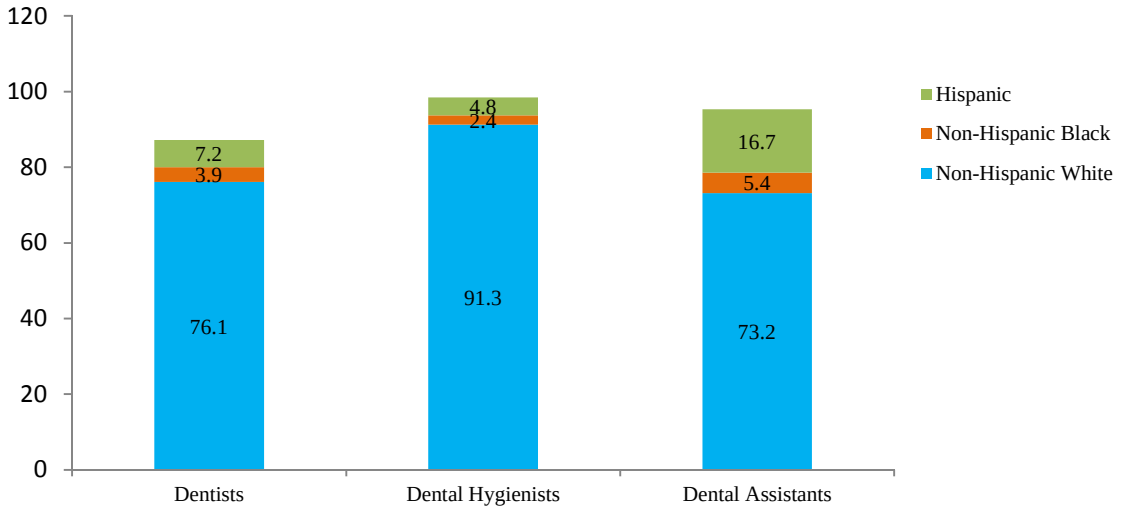


Both CT and the U.S. are expected to experience a decline in the dental workforce continuing through at least 2020. This decline is a reflection of several variables including: a 37% decrease in the number of students entering dental school between 1978 and 1990, an aging dental workforce, and a growing disparity between the estimated number of retiring dentists and dental school graduates.[3]

According to CT state licensing data, there was a total of 3,385 dentists with active CT licenses in 2011. Among these, 1356 were out of state, yielding a net of 2,029 dentists. The apparent increase in dentists between the 2011American Dental Association Survey data and the 2011 CT state licensing data may be an over-estimate due to differences in data collection.

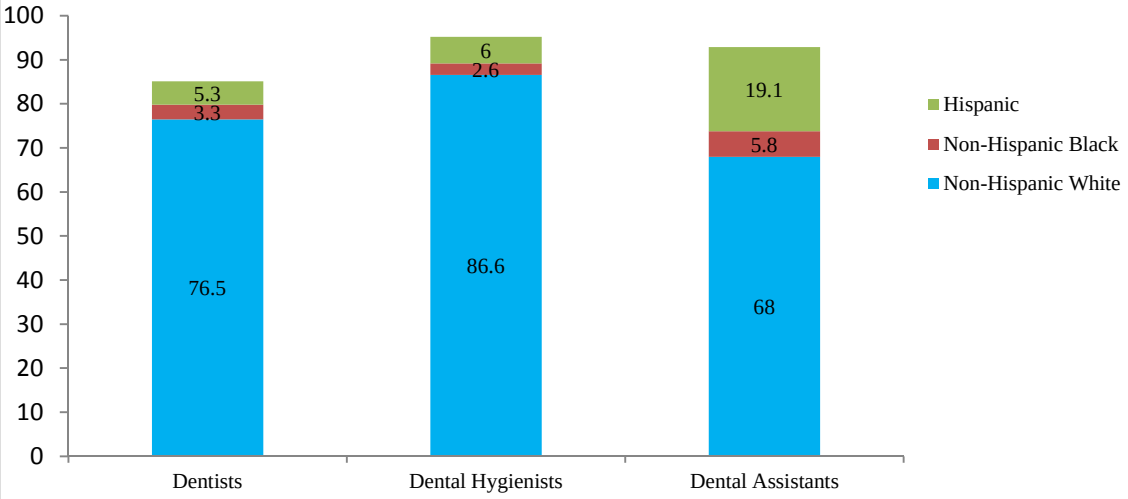
The racial and ethnic composition of the state workforce impacts the availability of culturally competent care for the population served (see figures 5A-3 & 5A-4).[2] In CT, and the nation as a whole, the dental workforce is not representative of the state's population.

Figure 5A-3: Proportion of dentists, dental hygienists, and dental assistants in Connecticut by race/ethnicity, 2006-2010



Source: U.S. Census Bureau, 2006-2010 American Community Survey, Connecticut

Figure 5A-4: Proportion of dentists, dental hygienists, and dental assistants in the U.S. by race/ethnicity, 2006-2010



Source: U.S. Census Bureau, 2006-2010 American Community Survey, United States

In CT and the US, women represent a small but growing percentage of the total number of dentists. According to the 2006-2010 American Community Survey, 16.6% of CT's dentists and 22.7% of U.S. dentists were women.[2]

By contrast, women constituted 50% of dental degree recipients in CT in 1999-2000.[1] The number of active female private practitioners is expected to increase over time as a reflection of the increasing percentage of dental graduates who are women. The Dentist Workforce Model, developed by Brown and Lazar predicted that 18.7% of private practitioners in 2005 would be

women. By 2010, this percentage would increase to 22%; and by 2020, women would represent 28.3% of private dentists in the U.S.[4] The full impact of gender differences in dental practice is unclear and further study is needed to evaluate the impact of an increasingly female workforce.[5,6,7]

According to 2012 data from the CT Department of Labor (DoL), general dentists in CT earned an annual average wage of $184,460.[8] The job outlook for dentists in CT is strong, with a forecasted average of 65 job openings per year.[9]

As of 2010, there are a total of 60 dental schools located in 36 states. There are 4 dental schools in New England with one of those in CT – the University of Connecticut School of Dental Medicine.[10] The School of Dental Medicine's first D.M.D. class graduated in 1972. As of 2008, there were 1,285 D.M.D. alumni. The school includes 8 accredited advanced training/specialty programs from which there were 746 alumni as of 2008. As many as 40-50% of CT's practicing dentists are affiliated with UCONN's School of Dental Medicine, and 68% of alumni live and practice in Connecticut, Massachusetts, and New York.[11]

Dental Hygienists

According to the 2006-2010 American Community Survey, there were 2,075 licensed, practicing dental hygienists in CT.[2] This number is equivalent to 58.05 dental hygienists per 100,000 population – nearly 25% higher than the national rate of 45.76 dental hygienists per 100,000 population.[2] In CT, there is almost one dental hygienists per dentist, similar to the national rate.[1]

The racial and ethnic composition of the state dental hygiene workforce impacts the availability of culturally competent care for the population served. Among dental hygienists in the state, White non-Hispanics are over-represented while Blacks and Hispanics are all under-represented (see figures 5A-3 & 5A-4). In CT, and the nation as a whole, women represent an overwhelming majority of the dental hygiene workforce. According to 2006-2010 American Community Survey, 95.4% of dental hygienists were female. In CT, only 4.8% of dental hygienists were male.[2]

According to data from the CT DoL, dental hygienists earn an average annual salary of $73,228, with an average hourly wage of $35.20.[12] Between 2006 and 2016, dental hygiene is expected to experience an average annual growth rate of 1.8% with 123 average annual job openings.[12]

In CT, under Section 20-126*l* of the General Statutes a dental hygienist practices under the general supervision of a dentist, which means, with the dentists' knowledge and consent, the hygienists can perform services within their scope of practice with or without the dentist needing to be present on the premises at the time services are delivered. However, a dental hygienist with two years of dental hygiene experience can practice in a public health facility including community health centers (CHCs), group homes, schools, preschools, Head Start programs and WIC sites without the supervision of a dentist, so long as the dental hygienist has a refers for treatment any patient with needs outside the dental hygienist's scope of practice and coordinates such referral for treatment to a licensed dentist.[13] The ability of dental hygienists to practice in these public health settings without the supervision of a licensed dentist is an important option in ensuring access to care for underserved populations.

As of 2010, there are over 200 accredited dental hygiene programs in the U.S.[14] Connecticut is home to four schools of dental hygiene. Lincoln College of New England (formerly Briarwood College), and Tunxis Community College both offer Associate degree programs in dental hygiene. The Fones School of Dental Hygiene at the University of Bridgeport and the University of New Haven offer both Associate and Bachelor degree programs. Fones School of Dental Hygiene also offers a Master of Science degree. The Fones School of Dental Hygiene has the distinction of being the first school of dental hygiene worldwide, founded in 1913 by Dr. Alfred Civilion Fones.

Dental Assistants

Dental assistants are not licensed, certified, or registered by the state of CT. Data on dental assistants is therefore only presented for U.S. Census Bureau data. According to the 2006-2010 American Community Survey, there were 2,990 dental assistants in CT, which was equivalent to 83.6 assistants per 100,000 population and 1.2 assistants per dentist.[2]

From 1991-1992 to 1999-2000, CT saw a 24% decline in the number of graduates from dental assistant training programs. During this same time period, the U.S. experienced a 107% increase in the number of dental assistant program graduates.[1] As a result of the decrease in the number of graduates and a simultaneous increase in CT's population, the ratio of dental assistants to 100,000 population decreased by 28%.[1]

Dental assistants in CT are more representative of the populations that they serve than either dentists or dental hygienists. Blacks and Hispanic remain under-represented among dental assistants in the state (see figures 5A-3 & 5A-4).[2]

Dental assistants in CT and the nation are overwhelmingly female. In 2010, 98.3% of dental assistants in CT and 96.4% of dental assistants in the U.S. were female.[2]

According to data from the CT DoL, dental assistants earn an average hourly wage of $19.25 for an average annual salary of $40,044.[8] Workforce projections for 2006-2016 predict an average of 126 job openings per year for dental assistants.[15]

Training for dental assistants is offered by community colleges, vocational schools, and technical institutes. Dental assistants may also receive on-the-job training. Dental assistants must complete the radiology section of the Dental Assisting National Board examination in order to take dental x-rays in CT.

B. Community and Migrant Health Centers and other State, County, and Local Programs

The dental safety net exists to close the cracks in the oral healthcare system and ensure that all individuals, regardless of insurance coverage or ability to pay have a source of accessible care.

Community Health Centers (CHC) provide family-oriented primary and preventive health care services for people living in rural and urban medically underserved communities. CHCs exist in areas where economic, geographic, or cultural barriers limit access to primary health care. The Migrant Health Program (MHP) supports the delivery of migrant health services, serving more

than 650,000 migrant and seasonal farm workers annually across the U.S. Among other services provided, many CHCs and Migrant Health Centers provide dental care services.

Healthy People 2020 objective OH-10 is to "Increase the proportion of local health departments and Federally Qualified Health Centers (FQHCs) that have an oral health program".[1] In 2013, CT has seventy-four Local Health Departments/ Districts of which 8 (11.5%) have an oral health care programs; the *Healthy People 2020* target is 83.0%.[2]

The dental safety net system is a network of outpatient clinics that provide oral healthcare services to patients at risk for low access to care due to a variety of factors including income, insurance coverage, primary language spoken, or transportation. The cornerstones of the dental safety net system are FQHCs and FQHC look-alikes. FQHCs are outpatient clinics that receive grant funds from the federal government through Section 330 of the Public Health Service Act. An FQHC look-alike is an outpatient clinic that meets all of the requirements to receive Section 330 grant funds but is funded by an alternate source.

Connecticut is served by a total of 14 CHC corporations, including 13 FQHCs and1 FQHC look-alikes. These CHC corporations provide healthcare in a total of 98 of the 169 cities and towns in CT. Dental care is available at CHC-linked sites in 32 communities. (see Table 5D-1).

Table 5D-1: Federally Qualified Health Centers in Connecticut[4,5]

Name	Towns served by Sites Offering Dental Services	Static Sites Offering Dental Services	Total Number of Sites
Charter Oak Health Center, Inc.	Hartford	2	12
Community Health Center, Inc.	Bloomfield, Bristol, Clinton, East Windsor, Enfield, Groton, Hamden, Meriden, Middletown, New Britain, New London, North Stonington, Norwalk, Old Saybrook, Plainville, Portland, Stamford, Stonington, Wallingford, Waterford, Westbrook, Windsor, Windsor Locks	7	33
Community Health Services, Inc.	Hartford	1	2
Cornell Scott Hill Health Corporation	Derby, New Haven	2	21
First Choice Health Centers	East Hartford, Manchester, Vernon	2	24
Fair Haven Community Health Care, Inc.	None	0	7
Generations Family Health Center, Inc.	Willimantic	1	55
Optimus Health Care, Inc.	Bridgeport, Stratford, Stamford	4	22
South-West Community Health Center, Inc.	Bridgeport	6	20
StayWell Health Center, Inc.	Waterbury	5	6

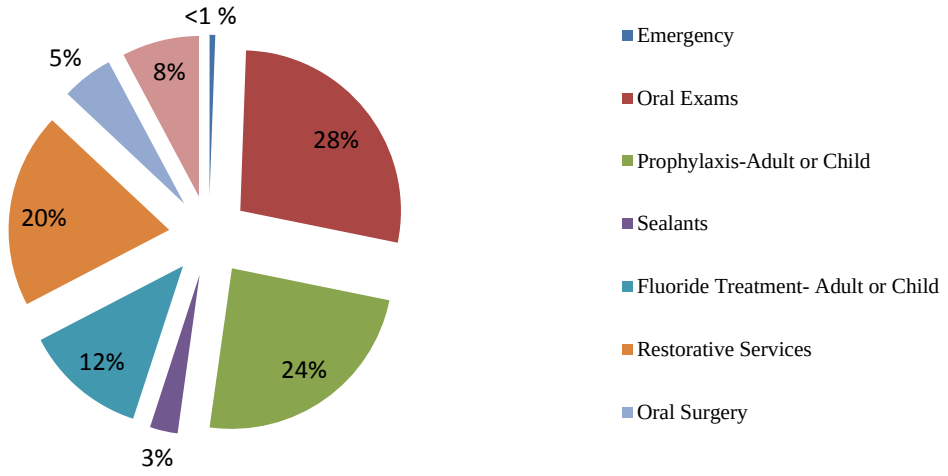
Community Health and Wellness Center of Greater Torrington	Torrington	1	6
Connecticut Institute for Communities, INC. Greater Danbury Community Health Center	None	0	1
Norwalk Community & Family Services, Inc.	None	0	2
Federally Qualified Health Center Look Alikes			
United Community & Family Services	Groton, Norwich, Waterford	1	66
Totals	36 Towns	32	277

Source: HRSA Bureau of Primary Health Care (BPHC) Data warehouse Report, 2012. Available from: http://bphc.hrsa.gov/
Source: Connecticut Department of Public Health, Community Health Centers, 2013. Available from: http://www.ct.gov/dph/cwp/
Source: Community Health Center Association of Connecticut

In 2011, a total of 315,992 patients in CT had a total of 1,538,988 clinic visits at one of 13 FQHCs in the state. A total of 86,814 (21%) patients received dental care, representing 247,013 (16%) of the total clinic visits. FQHCs in CT employed 62.80 full-time equivalents (FTE) dentists, 48.12 FTE dental hygienists, and 96.45 FTE dental aides/techs in 2011. All dental staff combined represented only 8.42% of the FTE workforce at FQHCs.[3]

Preventive services (prophylaxis, fluoride treatments, and dental sealants) accounted for 39% of dental services at FQHCs in CT in 2011. Treatment services (oral surgery, restorative services, emergency services, and rehabilitative services) made up 33% of services delivered (see Figure 5D-1).[3]

Figure 5D-1: Dental Services at Connecticut FQHCs by Type of Service, 2011



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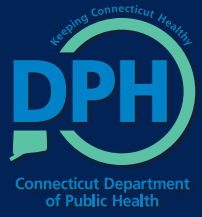

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