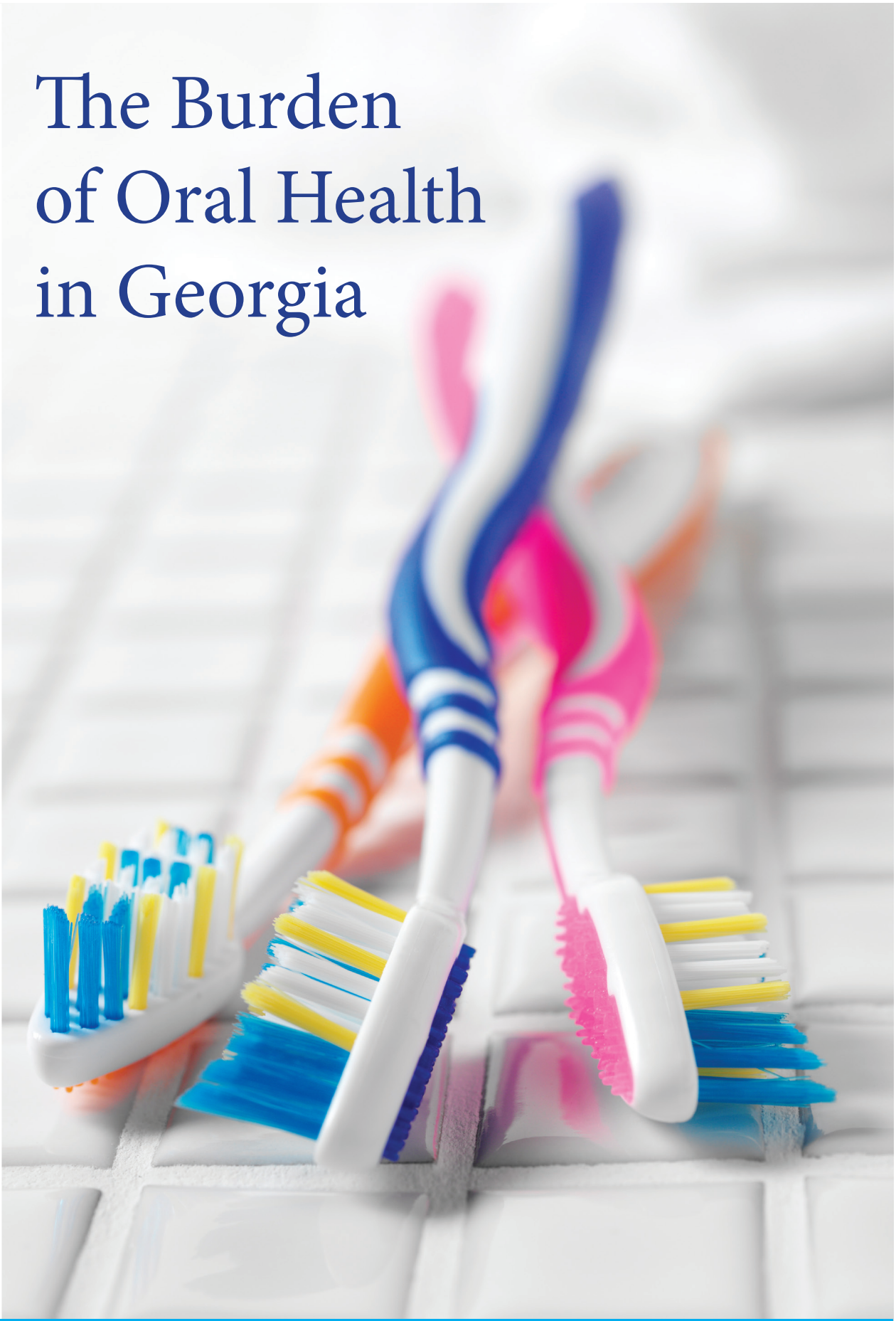
The Burden of Oral Health in Georgia



Georgia Department of Public Health

Georgia Oral Health Program
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Oral diseases are major public health problems. They affect most children and adults in most communities and can have high individual, social and economic consequences. This document aims to assess the magnitude of oral diseases in Georgia and the state's response to the burden of oral health.

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Executive Summary

Oral diseases are major public health problems. They affect most children and adults in most communities and can have high individual, social and economic consequences. This document aims to assess the magnitude of oral diseases in Georgia and the state's response to the burden of oral health.

Burden of Oral Disease and National Objectives

Georgia has made great strides in achieving the Healthy People 2010 (HP2010) objectives in:

- Community water fluoridation: 92% of Georgians have access to fluoridated water through public community water systems compared to 75% for HP2010.
- Untreated dental decay among children: 19% of 3rd graders in Georgia have untreated dental decay compared to 21% for HP2010.
- Adults (35-44 years) with no tooth extracted due to oral disease: 67% of Georgians did not have any tooth extracted due to oral disease compared to 40% for HP2010.
- Older adults (65-74 years) who lost all their natural teeth due to oral disease: 21% of older Georgians lost all their natural teeth compared to 22% for HP2010.

However, the state lags behind HP2010 objectives in several oral health indicators including:

- Dental caries experience in young children age 2-5 years and children in 3rd grade: The proportion of children age 2-5 years who have caries experience in Georgia (44%) is 4 times higher than the HP2010 objective (11%), while the proportion of 3rd grade children who have caries experience (52%) in Georgia is 24% higher than the HP2010 objective.
- Untreated dental decay: The proportion of children age 2-5 years who have untreated dental decay (27%) is 3 times higher than the HP2010 (9%).
- Sealant on molars: The proportion of children with sealant on their molars (37%) is 26% lower than the HP2010 target.
- Early detection of oral and pharyngeal cancers: The proportion of cancer detected at an early stage (35%) is 30% lower than the HP2010 target.
- Oropharyngeal cancer mortality: The age adjusted mortality rate of oropharyngeal cancer, 2.8 per 100,000 population is higher than the HP2010 target of 2.4 per 100,000 population.

Oral Health Disparities

- The prevalence of tooth decay among children with low socio-economic status (SES) is 50% higher than the prevalence of tooth decay among children in high SES. Similarly, the prevalence of untreated tooth decay and need of dental care in children from low SES households was almost twice as high as children from high SES households. Hispanic children and children in rural areas have significantly higher prevalence of tooth decay (64% and 60% respectively), compared to non-Hispanic children and children in urban areas (50% and 48% respectively).
- The proportion of non-Hispanic black and Hispanic high school students who visit an emergency room (ER) or urgent care center for oral or dental problems (10.3% each) is twice the proportion of non-Hispanic white high school students who visit an ER for the same problems (4.9%).
- Adults earning $50,000 or more per year are significantly more likely to visit a dentist than adults with income less than $15,000 a year (85% vs. 39%).

Prevention and Risk Factors

Most common oral diseases and conditions can be prevented. The two most effective community-based preventive interventions for decreasing dental decay are community water fluoridation and school-based sealant programs.

- Georgia provides community water fluoridation to 92% of its population who are using public water systems.
- The state also provides school-based dental sealant programs and fluoride programs as well as fluoride supplements.

Oral diseases such as periodontal diseases and oral cancers can be prevented through addressing known risk factors such as tobacco and alcohol use. Behavioral surveys in Georgia indicated that there is a steady decrease in cigarette smoking by middle and high school students over the past 25 years. However, teenagers are increasingly using smokeless tobacco.

- The 2009 YRBS survey indicated that 23.4% of high school students in Georgia smoke or chew tobacco and 11.9% smoked their first cigarette before the age of 13.
- The 2011 BRFSS survey indicated that more than one in five adult Georgians (21%) are smokers, and 6% are heavy drinkers (consuming more than one drink everyday).

Dental Care Workforce

The dental care workforce is limited and tends to be concentrated in urban areas in Georgia. The state has only one dental school, which graduates approximately 60 dentists per year, and 14 dental hygiene schools.

- The Georgia Board of Dentistry indicated in 2012 that there are 5515 active licensed dentists, representing one dentist per approximately 1700 population; and 6761 licensed dental hygienists in the state.
- The Health Resources and Services Administration (HRSA) has designated 42 counties as dental health professional shortage areas in Georgia.

This report further summarizes current information available on the burden of oral disease in Georgia. It includes data from a number of different sources, both local and national. It also highlights those populations within our state that suffer most from oral diseases, and the strategies being employed to prevent oral diseases and provide increased access to care. Comparisons are made to national data and to Healthy People 2010 objectives when appropriate.

I. Background/Introduction

Oral health is an essential and integral component of overall health and is much more than just healthy teeth. Good oral health not only means being free of tooth decay and gum disease, but it also means being free of chronic oral pain, oral cancer, birth defects such as cleft lip and palate, and other conditions that affect the mouth and throat. Oral health is intimately related to the health of the rest of the body. Mounting evidence suggests that infections in the mouth such as periodontal (gum) diseases may increase the risk of heart disease and complicate the control of blood sugar for people living with diabetes. There is also evidence suggesting that oral infections put expectant mothers at greater risk for pregnancy complications as well as put their children at risk for future dental disease. In addition, 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.

Oral diseases are highly prevalent in the community and are major public health problems affecting more than half of school children and the majority of adults.[1] Oral refers to the whole mouth, including the teeth, gums, hard and soft palate, linings of the mouth and throat, tongue, lips, salivary glands, chewing muscles, and upper and lower jaws. Oral diseases include a wide array of disease conditions ranging from tooth decay (dental caries) to life-threatening oral cancers.

Most oral diseases are chronic in nature, affecting people in all life stages, and need adequate and timely treatment. The cost of dental care is increasing (**Figure 1**); it accounts for 7% of overall health expenditures nationally, according to the 2007 Medical Expenditure Panel Survey.[2]

Some risk factors for oral disease include tobacco and alcohol use, poor dental hygiene, little knowledge of oral disease risk factors, and insufficient access to fluoride. Public health interventions targeting the reduction of those risk factors indicate that interventions can reduce the oral disease burden and improve the quality of life at a relatively low cost.[3] The incidence of oral cancer has declined with the decrease in prevalence of smoking in the population. Similarly, water fluoridation introduced in 1945 has reduced the prevalence of childhood caries initially, by 50%-60%. Complementing the widespread use of fluoride toothpaste and rinses, water fluoridation decreases tooth decay rates by an additional 18%-40% in communities with access to fluoride through their local water systems.[4]

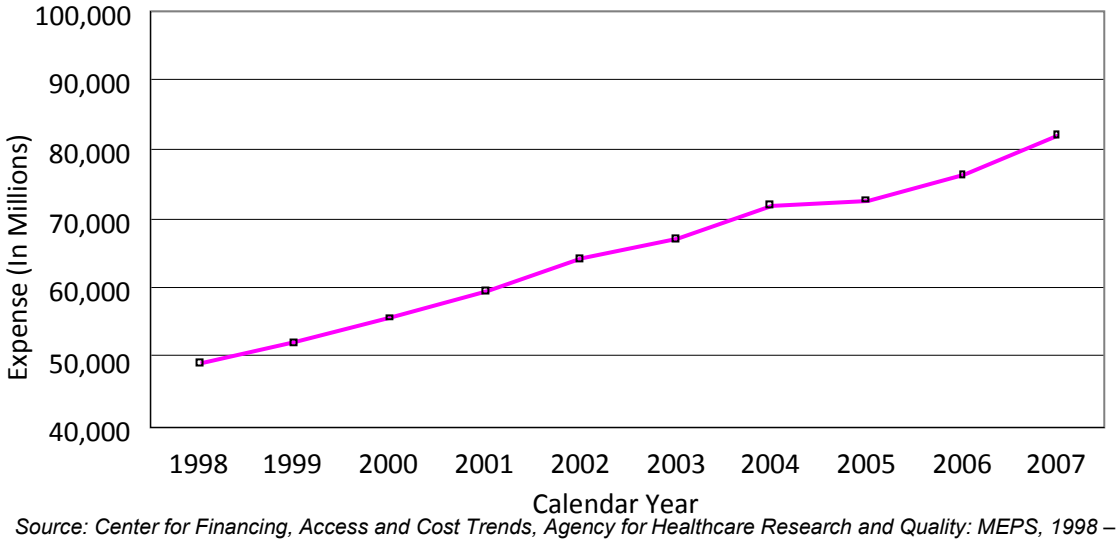
Despite great achievements in improving the overall oral health status of the general population, problems still remain in many communities– particularly among disadvantaged groups. The distribution and severity of oral diseases vary among different socio-demographic groups within the same state or region. Behavioral, social and environmental factors play a major role in determining the burden of oral diseases.

In 2000, a report titled: "Oral Health in America: A Report of the Surgeon General"[5] brought oral health to the forefront of public health. It identified oral diseases as a threat to the overall health status and well-being of Americans and set national goals and targets related to oral health that are included in the Healthy People 2010 (HP2010) Objectives.

Monitoring and assessing the progress made in reducing the burden of oral disease is of paramount importance in understanding what is attainable and in planning for future interventions.

This report will help increase oral health awareness; highlight the importance of monitoring oral health status and ultimately guide oral health prevention efforts in the state.

Figure 1. Trends in National Dental Services* Total Expenditure, US 1998-2007



*Source: Center for Financing, Access and Cost Trends, Agency for Healthcare Research and Quality: MEPS, 1998 – 2007. *Expenses for any type of dental providers are included*

II. Demographics of Georgia

Georgia has registered a considerable population growth in recent years, far surpassing the national average. From 2000 to 2010, the population has increased by 18.3% compared to the national average of 9.7 %. As of 2010, Georgia had a population of 9,687,653 people. The majority (74%) are adults over 18 years of age (**Table 1**), with those above 65 years constituting 11% of the total population.[6]

Most of the population is non-Hispanic white (60%) followed by non-Hispanic black (30%). Hispanics or Latinos account for 9 % of the population. Georgia is home to 7.5% of the nation's non-Hispanic black population, the fourth largest non-Hispanic black population in the United States. A third of non-Hispanic blacks are concentrated in three counties that are part of the Atlanta metropolitan area– Clayton, DeKalb, and Fulton, but only 18% of the 159 counties are predominantly non-Hispanic black.[7]

Georgia ranks 20th among states in population density, although it is the ninth most populous state in the nation.[6] The state has 159 counties, and 108 of them are classified as rural by the Office of Health Indicators for Planning, Georgia Department of Public Health. About one in six Georgians (18%) lives in rural areas; the remaining population is clustered around metropolitan areas including Atlanta, Augusta, Brunswick, Columbus, Macon, Savannah, Athens, and Rome. In 2010, Georgians' per capita and household incomes were lower compared to the national average, and an estimated 18 % of Georgians had income below the poverty level. A quarter of the state residents have tertiary education as does a similar proportion of people in the nation (**Table 1**).[6]

Table 1. Socio-demographic Characteristics of Georgians Compared to the US Population

	Georgia	US
Population:	9,687,653	308,745,538
Population percent change April 1, 2000 to July 1, 2010	18.3%	9.7%
Persons < 5 years old	7.1%	6.5%
Persons <18 years old	25.7%	24%
Persons 18 years and over	74.3%	76.0%
Persons 65+ years old	10.7%	13.1%
Non-Hispanic blacks	30.5%	12.6%
Non-Hispanic whites	59.7%	74.2%
American Indian and Alaskan Native	0.3%	0.8%
Hispanic or Latino	9.2	16.2
Asian	3.2%	4.8%
Native Hawaiian and Other Pacific Islander	0.1%	0.2%
Other Race	4%	4.8
Multiracial	2.1%	2.7%
High school graduates, persons age 25+	84.3%	85.6%
Bachelor's degree or higher, persons age 25+	27.3%	28.2%
Median household income	$ 46,430	$50,046
Per capita money income	$ 23,383	$26,059
Persons below poverty level	17.9%	15.3%
Land Area (2000) sq mi	57,906.14 sq mi	3,537,438.44 sq mi
Persons per sq mile	168.4	87.4

Source: US Census Bureau, 2010

Georgia has achieved the HP2010 objectives in community water fluoridation and in reducing the prevalence of adult tooth loss, but it lags behind in providing protective measures and preventing childhood caries (**Table 2**).

Table 2. HP2010 Oral Health Indicators, Target Levels, and Current Status in the US and Georgia

HP2010 Indicator	Georgia (%)	US (%)	HP2010 Target (%)
21-1. Dental caries experience in primary or permanent teeth			
21-1a. (1 - 5 yrs)	44[A]	22[a]	11
21-1b. (6 - 11 yrs)	52[B]	53[a]	42
21-1c. (12 - 17 yrs)	DNC	56[a]	51
21-2. Untreated dental decay			
21-2a. (1 - 5 yrs)	27[A]	19[a]	9
21-2b. (6 - 11 yrs)	19[B]	29[a]	21
21-2c. (12 - 17 yrs)	DNC	18[a]	15
21-2d. (18 yrs +)	DNC	28[a]	15
21-3. Adults with no tooth extracted due to oral disease (35-44 yrs)	67[C]	38[a]	40
21-4. Older adults who lost all their natural teeth (65-74 yrs)	21[C]	24[a]	22
21-5. Periodontal disease(35 - 44 yrs)			
21-5a. Gingivitis	DNC	48[b]	41
21-5b. Destructive periodontal disease	DNC	16[a]	14
21-6. Early detection of oral and pharyngeal cancers (Stage I)	35.1[D]	35[c]	50
21-7. Adults (≥ 40yrs) with annual exam for oral and pharyngeal cancers	DNC	13[d]	20
21-8. Sealants on molar teeth			
21-8a. Children aged 8 years	37[B]	32[a]	50
21-8b. Adolescents aged 14 years	DNC	21[a]	50
21-9. Population served by fluoridated water systems	92[E]	69[e]	75
21-10. Annual dental visit (≥ 2yrs)		45[e]	56
Young children (1-5 yrs)**	57[F]	54	56
Children (6-11 yrs)**	88[F]	90	56
Adolescents (12-17 yrs)**	92[F]	88	56
Adults	72[C]	42[e]	56
3-6. Age adjusted oropharyngeal cancer mortality (per 100,000 standard population)	2.8 (2.7, 3.0)[D]	2.6[f]	2.4

Note: DNC: data not collected
**: "During the past 12 months/since [his/her] birth, how many times did [child name] see a dentist for preventive dental care such as check-ups and dental cleanings?"

Sources:
a: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS. 1999-2004 data.
b: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS. 1988-94
c: Surveillance, Epidemiology, and End Results (SEER) Program, NIH, NCI. 1996-2000 data.
d: National Health Interview Survey (NHIS), CDC, NCHS.1996
e: CDC Fluoridation Census, CDC, NCCDPHP. 2006.
f: National Vital Statistics System – Mortality (NVSS-M), CDC, NCHS. 2003
A: Head Start oral health survey. Georgia 2006.
B: Third grade public school student oral health survey, Georgia 2011
C: Behavioral Risk Factor Surveillance System survey, Georgia 2010
D: Georgia Comprehensive Cancer Registry, 2002-2006 (In Situ + Localized).
E: Water Fluoridation Reporting System, CDC, 2010 Water Fluoridation Statistics
F: National Survey of Children's Health (NSCH), Maternal and child health bureau (MCHB), HRSA, DHHS 2007.

III. National and State Objectives on Oral Health

Oral Health in America: A Report of the Surgeon General alerted Americans to the importance of oral health in their daily lives.[8] Issued in May 2000, the report further detailed how oral health is promoted, how oral diseases and conditions are prevented and managed, and what needs and opportunities exist to enhance oral health. The report's message was that good oral health is essential to general health and well-being and can be achieved. However, several barriers hinder the ability of some Americans to attain optimal oral health. The Surgeon General's report concluded with a framework for action, calling for a national oral health plan to improve quality of life and eliminate oral health disparities.

One component of an oral health plan is a set of measurable and achievable objectives on key indicators of oral disease burden, oral health promotion, and oral disease prevention. One set of national indicators was developed in November 2000 as part of HP2010, a document that presents a comprehensive, nationwide health promotion and disease prevention agenda.[9] HP2010 is designed to serve as a roadmap for improving the health of all people in the United States during the first decade of the 21st century. Included are objectives for key structures, processes, and outcomes related to improving oral health. These objectives represent the ideas and expertise of a diverse range of individuals and organizations concerned about the nation's oral health.

The Surgeon General's report on oral health was a wake-up call, spurring policy makers, community leaders, private industry, health professionals, the media, and the public to affirm that good oral health is essential to general health and well-being and to take action. That call to action led a broad coalition of public and private organizations and individuals to generate *A National Call to Action to Promote Oral Health.*[10] The vision of the *Call to Action* is "To advance the general health and well-being of all Americans by creating critical partnerships at all levels of society to engage in programs to promote oral health and prevent disease." The goals of the *Call to Action* reflect those of HP2010:

- To promote oral health
- To improve quality of life
- To eliminate oral health disparities

National objectives on oral health such as those in HP2010 provide measurable targets for the nation, but most core public health functions of assessment, assurance, and policy development occur at the state level. The *National Call to Action to Promote Oral Health* calls for the development of plans at the state and community levels, with attention to planning, evaluation, and accountability.[10]

52% of 3rd grade children in Georgia have experienced dental caries.

IV. Disease burden

Oral diseases are common in most individuals' lives. The spectrum of oral diseases ranges from conditions as mild as minimal dental decay and acute gingivitis, to diseases as severe and fatal as oral cancer and autoimmune oral lesions.

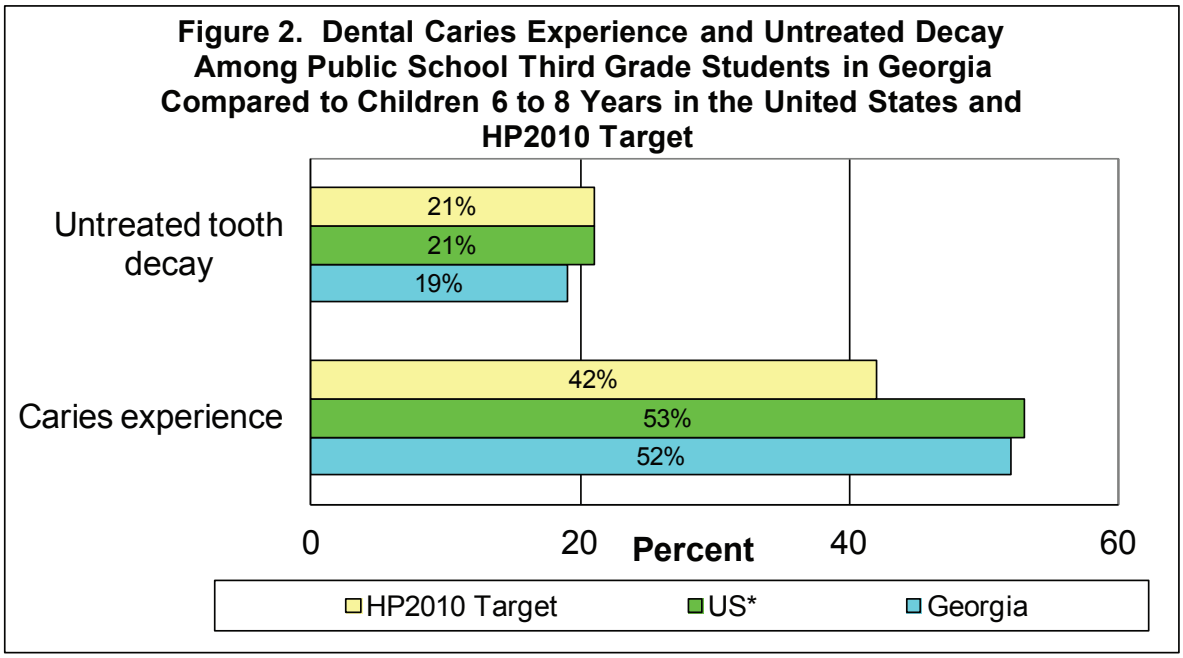
Tooth decay (dental caries) and periodontal (gum) diseases are the most prevalent oral problems and account for the largest part of the oral disease burden. Nationally, dental caries is four times more common than childhood asthma and seven times more common than hay fever. Dental caries are chronic and progressive, and result in pain and missed work or school days if not treated promptly and adequately.

They are also preventable through knowledge of how bacterial infections are spread, proper personal hygiene, good nutritional habits and regular dental care.

Caries experience and untreated decay are monitored by Georgia as consistent with the National Oral Health Surveillance System (NOHSS), which allows comparisons with other states and with the nation. For comparisons between Georgia, the nation, and the HP2010 targets, see **Figure 2**.

This section presents data on oral diseases including caries experience, untreated dental decay, and oral cancer among children, adolescents and adults.

Figure 2. Dental Caries Experience and Untreated Decay Among Public School Third Grade Students in Georgia Compared to Children 6 to 8 Years in the United States and HP2010 Target



Sources: Georgia (2011 3rd Grade Oral Health Survey); *US (NHANES: 2005-08 for untreated decay and 1999-2004 for caries experience)

A. Young and Elementary School Children

The prevalence of dental decay in children is measured by assessing caries experience (if they have ever had dental decay and now have fillings), untreated dental decay (active unfilled cavities), and urgent care (reported pain or a significant dental infection that required immediate care).

Dental caries is not uniformly distributed in the United States or in Georgia. Some groups are more likely to experience the disease and are less likely to receive treatment. A 2006/2007 Head Start survey in Georgia, which targeted young children (2-5 years) attending Head Start centers showed that the state did not meet the HP2010 objective for caries experience (11%) and untreated dental decay (9%). The proportion of young children who had caries experience in Georgia (44%) was 4 times higher than the HP2010 objective and the proportion of young children who had untreated dental decay (27%) was 3 times higher than the HP2010. The proportion of Hispanic young children with caries experience (51%) was 28% higher than the proportion of non-Hispanic young children who experienced dental caries (40%). Hispanic young children were more likely to have untreated dental decay (28%) compared to non-Hispanic children (25%). The proportion of non-Hispanic white young children who had severe early childhood caries (32%), white spot lesions (23%) or rampant caries (18%) was higher than the proportion of Hispanic and non-Hispanic black young children with the same conditions (**Table 3**). Young children from rural areas were more likely to have untreated dental decay (29%) than children from small cities (18%).[11]

Table 3. Proportion of Head-Start Children 2-5 Years Old with Caries Experience, Untreated Decay, and Dental Care Need by Ethnicity, Georgia 2006

	Non-Hispanics			Hispanics (%)
	Non-Hispanic black (%)	Non-Hispanic white (%)	Aggregate (%)	
Caries experience	38	52	40	51
Untreated dental decay	23	30	25	28
White spot lesions	18	23	19	17
Severe early childhood caries	19	32	22	27
Rampant caries	9	18	10	14
Dental care need	27	34	28	28

Source: Head-start program survey, Georgia 2006.

Data collected on 3rd grade children in Georgia in 2011 indicated that dental caries experience among 3rd grade children (52%) was comparable to the 2005 survey[12] when a similar data collection found that 56% of 3rd grade children had dental caries experience. However, the proportion of untreated tooth decay in 2011 (19%) was significantly lower than the proportion in 2005 (27%). This prevalence is lower than the HP2010 target of 21% (**Figure 2**).

The proportion of children with dental needs also decreased significantly from 2005 (27%) to 2011 (19%). Non-Hispanic black children had more untreated decay (21%) compared to non-Hispanic white children (17%) and low-income children had more need of immediate or urgent treatment (23%) compared to high-income children (12%) (**Table 4**). Nineteen percent of the children who participated in the 2011 survey needed urgent or early dental care (**Table 4**).

Table 4. Dental Caries Experience, Untreated Dental Decay, and Urgent Need for Dental Care Among Children 6 to 8 Years Old in the US and 3rd Graders in Georgia, by Demographic Characteristics

Demographic and Social Characteristic	Caries Experience		Untreated Dental Decay		Early or Urgent Need for Care	Dental Sealant	
	United States[a] (%)	Georgia[b] (%)	United States[a] (%)	Georgia[b] (%)	Georgia[b] (%)	United States (%)	Georgia[b] (%)
Race or Ethnicity							
Non-Hispanic black	56	52	32[d]	21	22	16[d]	29
Non-Hispanic white	49	51	17[d]	17	17	21[d]	38
Non-Hispanic	-[f]	51		18	18		37
Hispanic	69	64	-[e]	23	24	-[e]	41
Gender							
Male	56[c]	54	23[d]	19	18	20[d]	37
Female	51[c]	50	20[d]	19	19	20[d]	38
Eligible for free or reduced lunch							
Yes	-[f]	60	-[f]	23	23	-[f]	34
No	-[f]	40	-[f]	12	12	-[f]	43
TOTAL	53[c]	52	21[d]	19	19	20[d]	37

Notes and sources:
a: All national data are for children aged 6–8 years old
b: Third grade public school student survey, Georgia 2011
c: Data are from NHANES III, 1999–2004 accessed from CDC WONDER, the Healthy People 2010 Database, February 2009 Edition
d: Data are from NHANES, 2005-2008.
e: Data have not been analyzed
f: Data for specific population are not collected

Healthcare facilities from five Atlanta metropolitan counties– Clayton, Cobb, DeKalb, Gwinnett, and Fulton – participate in a birth defect registry coordinated by the Centers for Disease Control and Prevention (CDC). Based on the Metropolitan Atlanta Congenital Defects Program, every year around 228 newborns are affected by cleft palate and cleft lip needing immediate intervention.[13] Hispanics and non-Hispanic whites were slightly more affected than other ethnic and racial groups (**Table 5**).

Table 5. Oro-facial Birth Defects Counts and Prevalence Rate* in Metropolitan Atlanta Congenital Defects Program, Georgia 2002-2006

Defect	Non-Hispanic white N (Rate)	Non-Hispanic black N (Rate)	Hispanic N (Rate)	Asian or Pacific Islander N (Rate)	American Indian/ Alaskan Native N (Rate)	Total N (Rate)
Cleft lip with and without cleft palate	95 (10.49)	71 (7.23)	61 (11.24)	12 (7.64)	0 (0.00)	243 (9.30)
Cleft palate without cleft lip	53 (5.85)	47 (4.79)	36 (6.63)	5 (3.18)	0 (0.00)	144 (5.51)

Source: National Birth Defects Prevention Network.
*Rate per 10,000 live births

B. Middle and High School Children

The 2009 Youth Risk Behavior Survey (YRBS) [14] in Georgia indicated that 44% of middle school children and 54% of high school children had one or more cavities in their permanent teeth. Fifty-three percent of high school children reported that their teeth or mouth have been painful or sore one or more times during the past 12 months, while 55% of middle school children reported the same symptoms. Half of Hispanic children in middle school had at least one dental cavity, while 59% of non-Hispanic white children in middle school had reported tooth or mouth pain (**Figure 3**). Among high school children, 57% of non-Hispanic white had at least one dental cavity and 57% of non-Hispanic black had tooth or mouth pain (**Figure 4**).

Figure 3. Proportion of Middle School Children with Dental Cavity and Toothache/Mouth Sore During Past 12 Months by Gender and Race/Ethnicity, Georgia, 2009

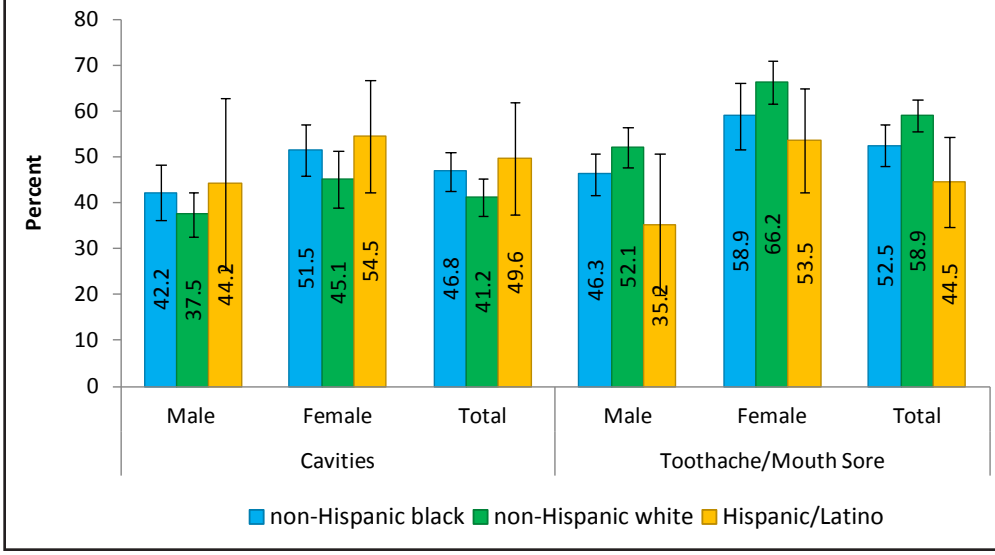
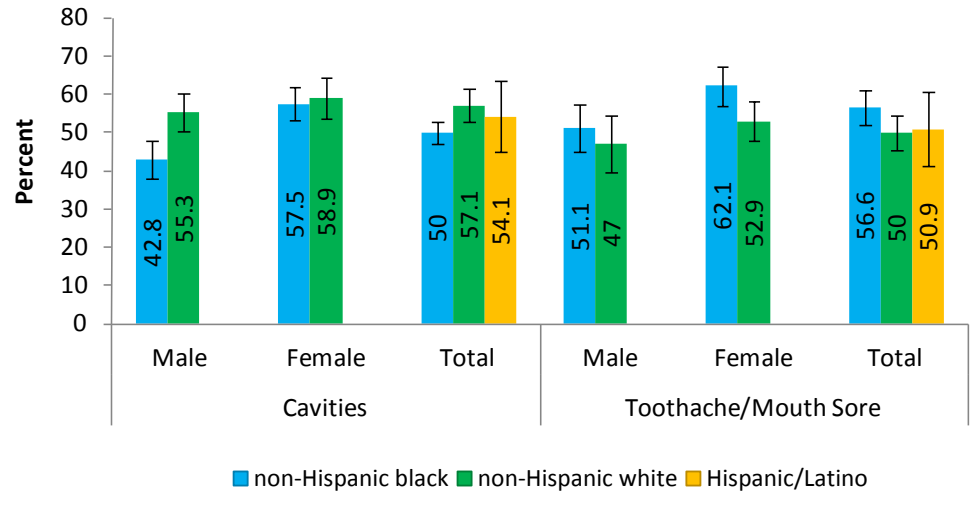


Figure 4. Proportion of High School Children with Dental Cavity and Toothache/Mouth Sore During Past 12 Months by Gender and Race/Ethnicity, Georgia, 2009



C. Adults

People are susceptible to dental caries throughout their lifetime. Like children and adolescents, adults can experience new decay on the crown (enamel covered) portion of the tooth. However, adults can also develop caries on the root surfaces of teeth as those surfaces become exposed to bacteria and carbohydrates as a result of gum recession. In the most recent national examination survey, 85% of U.S. adults had at least one tooth with decay or a filling on the crown. Root surface caries affects 50% of adults aged 75 years or older.[8]

Not only do adults experience dental caries, but a substantial proportion of that disease can go untreated at any point in time. However, there is no data tracking system for untreated dental decay in Georgia for adults aged 18 years and older.

A full dentition is defined as having 28 natural teeth, exclusive of third molars (the wisdom teeth) and teeth removed for orthodontic treatment or as a result of trauma. Most persons can keep their teeth for life with adequate personal, professional, and population-based preventive practices. As teeth are lost, a person's ability to chew and speak decreases and interference with social functioning can occur. The most common reasons for tooth loss in adults are tooth decay and periodontal (gum) disease. Tooth loss can also result from infection, unintentional injury, and head and neck cancer treatment. In addition, certain orthodontic and prosthetic services sometimes require the removal of teeth.

Despite an overall trend toward a reduction in tooth loss in the U.S. population, not all groups have benefited to the same extent. According to the National Health and Nutrition Examination Survey (NHANES) 2009-2010,[15] more than half of the adult population 25-44 years of age had retained all their teeth (53%). Among adults 45-64 years of age, only 29% had their full set of permanent teeth (excluding third molars). Non-Hispanic whites (58%) had a higher teeth retention compare to non-Hispanic blacks (43%) and Hispanics (46%). The Behavioral Risk Factors Surveillance System (BRFSS)[16] survey in 2010 indicated that in Georgia, 21% of adults 65 years and older had lost all their teeth and that 44% of adults 18 years and older had lost at least one permanent tooth.[13]

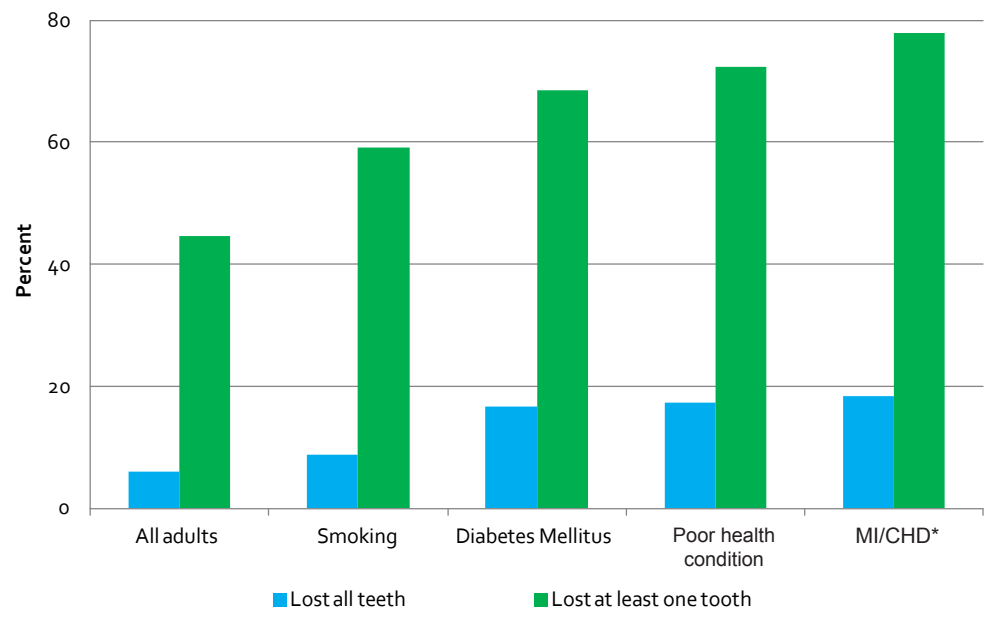
Data for Georgia and the United States on the percentage of adults who have had no teeth extracted because of disease and the percentage that have lost all of their permanent teeth are presented in **Table 6**.

Table 6. Proportion of Adults Who Have Lost No Teeth and Proportion of Adults Who Have Lost All Natural Teeth, by Selected Demographic Characteristics, Georgia		
	No Tooth Loss	Loss All Natural Teeth
	Georgia[a] % (CI)	Georgia[b] % (CI)
Race/Ethnicity		
Non-Hispanic white	59.7 (57.5 - 61.8)	19.2 (16.8 -21.6)
Non-Hispanic black	45.1 (41.1 - 49.2)	27.7 (20.5 - 34.9)
Hispanic	64.4 (54.5 - 74.3)	N/A
Gender		
Male	56.9 (53.9 - 59.9)	19.1 (15.4 - 22.9)
Female	56 (53.8 - 58.1)	22.4 (19.5 - 25.2)
Education Level		
Less than high school	26.7 (21.2 - 32.3)	43.1 (36.8 - 49.3)
High school graduate	43.8 (40.0 - 47.7)	24.8 (20.4 - 29.2)
At least some college	56.7 (53.1 - 60.4)	13.3 (9.4 - 17.2)

a: Adults 18 years and older, BRFSS, 2010
b: Adults 65 years and older, BRFSS 2010

Although the underlying mechanism is not yet completely elucidated, it has been well-documented that some chronic systemic illnesses are associated with oral disease.[17-21] As shown in **Figure 5**, BRFSS data in Georgia indicated that more than 3/4 of persons with coronary heart disease or stroke had lost at least one tooth and about 2/3 of persons with diabetes mellitus had lost at least one tooth.

Figure 5. Adults with Tooth Loss from Tooth Decay or Gum Diseases by Health Status, BRFSS Georgia 2008



* Myocardial Infarction/ Coronary Heart Disease

Every year, on average, 916 Georgians suffer from oral cancer, and 219 will die of this disease.

Cancer of the oral cavity or pharynx (oral cancer) is the fourth most common cancer in non-Hispanic black men and the seventh most common cancer in non-Hispanic white men in the United States.[22] An estimated 28,000 new cases of oral cancer and 7,200 deaths from these cancers occurred in the United States in 2004. The 2001 age-adjusted (to the 2000 U.S. population) incidence rate of oral cancer in the United States was 10.4 per 100,000 persons. Nearly 90% of cases of oral cancer in the United States occur among persons aged 45 years and older. The age-adjusted incidence was more than twice as high among men (15.0) than among women (6.6), as was the mortality rate (4.1 vs. 1.6).

Survival rates for oral cancer have not improved substantially over the past 25 years. More than 40% of persons diagnosed with oral cancer die within five years of diagnosis,[22] although survival varies widely by stage of disease when diagnosed. The 5-year relative survival rate for persons with oral cancer diagnosed at a localized stage is 81%. In contrast, the 5-year survival rate is only 51% once the cancer has spread to regional lymph nodes at the time of diagnosis and is just 29% for persons with distant metastases.

The Georgia Comprehensive Cancer Registry collects information on malignancies including oral cancers.[23] Every year, on average, 916 Georgians (11.2 per 100,000 population per year) suffer from oral cancer, and 219 (2.8 per 100,000 population per year) will die of this disease. Men (17.3 per 100,000 population per year) are almost three times more likely to be affected than women (6.3 per 100,000 population per year). The incidence and mortality rates of oral cancer in Georgia are slightly higher than the national averages in both gender groups as shown in **Table 7**.

Table 7. Morbidity and Mortality Rates of Cancer of the Oral Cavity and Pharynx by Race and Gender, US and Georgia 2002-2006						
	Mortality rate (per 100,000 Population)		Morbidity			
			Incidence rate (per 100,000 Population)		Detected Early Localized (%)	Detected Late Metastasized (%)
	US % (CI)	GA % (CI)	US % (CI)	GA % (CI)		
Race or Ethnicity						
Non-Hispanic white	2.5 (2.4, 2.5)	2.6 (2.4, 2.8)	10.6 (10.6, 10.7)	11.6 (11.2, 12.0)	38.57	61.43
Non-Hispanic black	3.6 (3.5, 3.7)	3.6 (3.2, 4.0)	10.3 (10.2, 10.5)	10.1 (9.4, 10.8)	22.34	77.66
Hispanic	1.5 (1.5, 1.6)	-θ	6.9 (6.7, 7.0)	4.4 (3.1, 6.1)	-θ	-θ
Gender						
Male	3.9 (3.9, 4.0)	4.3 (4.0, 4.7)	16.0 (15.9, 16.1)	17.3 (16.6, 17.9)	31.06	68.94
Female	1.5 (1.4, 1.5)	1.6 (1.5, 1.8)	6.1 (6.0, 6.1)	6.3 (5.9, 6.6)	44.44	55.56
TOTAL	2.6 (2.6, 2.6)	2.8 (2.7, 3.0)	10.6 (10.6, 10.7)	11.2 (10.9, 11.6)	35.06	64.94

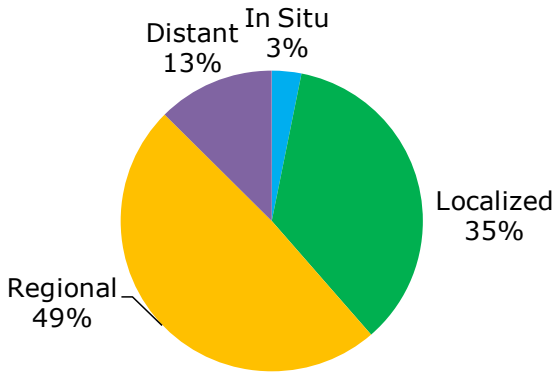
Note: -θ: Insufficient numbers for stable estimate
Sources: Georgia Comprehensive Cancer Registry (Georgia estimates); SEER (US estimates)

Oral cancers are not uniformly distributed across the state. Some counties have a significantly higher rate than others; nevertheless, no clear pattern suggests a specific underlying cause shared by the counties with a higher risk (**Annex II**).

Efforts exist to sensitize the community and dental professionals to the need for early detection and treatment of oral cancers; however, the proportion of patients diagnosed at the earliest stages of disease progression is relatively small. There is not a source of data for Georgians screened for oral cancer or how many of those are diagnosed at early stages.

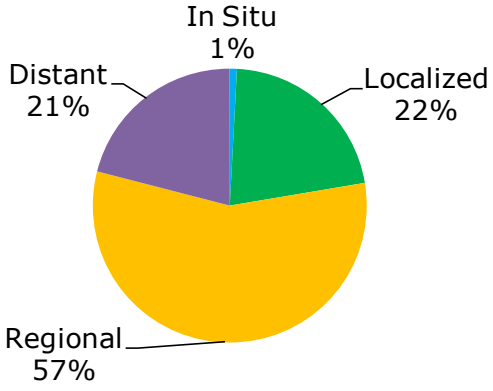
Currently, most patients (65%) are diagnosed at later stages when the disease has already spread to the adjacent regions or distant organs. In fact, despite the decline in oral cancer morbidity and mortality, the proportion of patients who are diagnosed with distant metastases has increased. For 2000-2004, 9% of non-Hispanic whites and 16% of non-Hispanic blacks with oral cancers were diagnosed in a late stage with distant organ metastases. However, by 2006, those proportions had increased to 13% for non-Hispanic whites and 21% for non-Hispanic blacks in Georgia (**Figure 6**).

Figure 6. Distribution of Oral Cancer by Tumor Staging and Race, Georgia 2002-2006



non-Hispanic white

Source: Georgia Comprehensive Cancer Registry



non-Hispanic black

Source: Georgia Comprehensive Cancer Registry

V. Oral Health Disparities

A. Racial 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. population. 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. Non-Hispanic black adults in each age group are more likely than other racial/ethnic groups to have gum disease. Compared with non-Hispanic whites, non-Hispanic blacks 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.

Despite great efforts since 1940 to address oral health issues, Georgia still faces disparities in both oral disease and access to dental services among its population. Hispanics, non-Hispanic blacks, residents of rural areas, persons with low SES, and older people are most affected by oral health problems and face more barriers to dental services.

Results from the 2011 3rd grade survey among public schools, shown in **Table 8**, illustrates oral health and needs disparities. Hispanic children and children in rural areas have significantly higher prevalence of tooth decay (64% and 60% respectively), compared to non-Hispanic children and children in urban areas (50% and 48% respectively). The proportion of tooth decay experience among non-Hispanic black children is similar to the proportion among non-Hispanic white children (52% and 51% respectively). However, the proportion of untreated tooth decay and need for dental care among non-Hispanic black children (21% and 22% respectively) is 25% higher than the proportion of untreated tooth and need for dental care among non-Hispanic white children (17% each).

Table 8. Tooth Decay Experience, Untreated Tooth Decay, Use of Sealant, and Need for Dental Care among 3rd Grade Public School Students by Gender, Race/Ethnicity, and Socio-economic Status, Georgia 2011

Characteristics	% Tooth Decay Experience	% Untreated Tooth Decay	% Sealant Use	% Need Dental Care
Socioeconomic status				
High SES	40	12	43	12
Low SES	60	23	34	23
Race				
Non-Hispanic black	52	21	29	22
Non-Hispanic white	51	17	43	17
Ethnicity				
Hispanic	64	23	41	24
Non-Hispanic	50	18	37	18
Gender				
Male	54	19	37	18
Female	50	19	38	19
Urban status				
Urban	48	19	38	19
Rural	60	19	36	20
Overall	52	19	37	19

Source: 2011 Georgia Third Grade Oral Health Survey.

Table 9- Dental Visit, Emergency Room Visit and Missed School by Gender and Ethnicity Among Middle and High School Students, Georgia 2009						
	High School Students			Middle School Students		
	Male % (CI)	Female % (CI)	Total % (CI)	Male % (CI)	Female % (CI)	Total % (CI)
Dental visit [a]						
non-Hispanic black	55.7 (49.1-62.0)	62.1 (56.2-67.7)	59.0 (53.9-63.8)	56.5 (46.9-65.6)	59.7 (51.8-67.0)	58.1 (52.1-63.8)
non-Hispanic white	76.7 (70.5-82.0)	80.1 (73.4-85.4)	78.5 (73.8-82.5)	73.3 (67.9-78.1)	79.4 (74.2-83.8)	76.3 (71.5-80.5)
Hispanic	-θ	-θ	52.8 (40.7-64.5)	44.9 (36.3-53.8)	59.0 (45.6-71.1)	52.2 (43.4-60.9)
Overall	64.2 (59.5-68.6)	70.0 (65.2-74.4)	67.2 (63.3-70.8)	63.1 (58.3-67.6)	68.2 (64.1-72.2)	65.6 (62.1-68.9)
ER Visit [b]						
non-Hispanic black	11.9 (8.9-15.7)	8.8 (6.1-12.4)	10.3 (8.5-12.6)	12.2 (8.6-17.0)	5.7 (3.0-10.6)	9.0 (6.2-12.8)
non-Hispanic white	7.7 (5.0-11.8)	2.3 (1.1-4.9)	4.9 (3.2-7.5)	5.4 (3.2-8.9)	4.7 (2.6-8.4)	5.1 (3.6-7.2)
Hispanic	-θ	-θ	10.3 (5.3-19.1)	3.6 (1.4-9.0)	6.8 (3.8-11.9)	5.3 (3.3-8.3)
Overall	10.5 (7.8-14.2)	5.6 (4.1-7.5)	8.1 (6.4-10.1)	8.3 (6.5-10.5)	5.5 (3.9-7.7)	6.9 (5.7-8.4)
Missed school [c]						
non-Hispanic black	14.6 (10.5-20.0)	19.5 (14.6-25.5)	17.0 (12.8-22.3)	22.0 (17.4-27.3)	19.2 (14.8-24.4)	20.6 (16.9-24.8)
non-Hispanic white	15.3 (11.4-20.2)	15.7 (11.1-21.8)	15.5 (11.7-20.2)	19.1 (15.6-23.2)	21.4 (16.8-26.9)	20.2 (16.7-24.3)
Hispanic	-θ	-θ	20.3 (15.2-26.6)	12.5 (7.0-21.4)	23.0 (15.9-32.1)	17.8 (12.0-25.7)
Overall	15.7 (12.7-19.4)	17.9 (14.7-21.7)	16.8 (14.0-20.2	19.6 (16.5-23.2)	20.4 (18.1-22.8)	20.0 (17.6-22.6)

Notes: **-θ**: Insufficient responses for stable estimate

a: Percentage of students who last saw a dentist for a check-up, exam, teeth cleaning, or other dental work during the past 12 months

b: Percentage of students who have missed school because of problems with their teeth or mouth one or more times during the past 12 months

c: Percentage of students who went to an emergency room or urgent care center for problems with their teeth or mouth one or more times during the past 12 months

Source: Youth Risk Behavior Surveillance Survey, Georgia 2009.

The most recent YRBS data indicated that 79% of non-Hispanic white high school students had seen a dentist for a check-up, exam, teeth cleaning or other dental work within a 12 month period compared to 59% of non-Hispanic blacks and 53% of Hispanics. Among middle school students, 76% of non-Hispanic whites had visited a dentist for some kind of exam or treatment compared to 58% of non-Hispanic blacks and 52% of Hispanics. In contrast the proportion of non-Hispanic black and Hispanic students who went to an emergency room or urgent care center for oral or dental problems (10.3% each) was twice the proportion of non-Hispanic white high school students who visited an ER for the same problems (4.9%). Among middle school students, the proportion of students who visited an ER was highest among non-Hispanic blacks (9%) compared to non-Hispanic whites and Hispanics (5.1% and 5.3% respectively) (**Table 9**).

The 2010 BFRSS survey data shown in **Table 10** indicated that among Georgia's adults 18 years and older, the proportion of non-Hispanic whites who visited a dentist for any reason during the past year was 16% higher than the proportion of non-Hispanic blacks who visited a dentist. The proportion of non-Hispanic blacks 65 years and older who had all their teeth extracted (28%) was 47% higher than the proportion of non-Hispanic whites who had all their teeth extracted (19%). Similarly, data from Georgia Comprehensive Cancer Registry shows that non-Hispanic blacks are more affected by oral cancers but are more likely to be diagnosed at late stages.

B. 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 an inability to receive the personal and professional health care needed to maintain oral health. More than 54 million persons are defined as disabled under the Americans with Disabilities Act, including almost 1 million children less than 6 years of age and 4.5 million children between 6 and 16 years of age.

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 disability 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 among people with disabilities but overall their caries rates are higher than those of people without disabilities.[8]

The 2009/10 National Survey of Children with Special Health Care Needs (NS-CSHCN) data for Georgia, indicated that 88% of children with special health care needed preventive dental care within a 12 month period while 24% needed other dental care such as orthodontics or periodontal care (**Table 11**). Ninety-five percent of children with special health care needs did not need dental care or received all dental care they needed. The unmet dental care needs for children with special health care needs (5.4%) is almost 3 times higher than the unmet dental care needs of children with no special needs (1.9%) (**Figure 7**).

Table 10. Proportion of Tooth Extracted and Dental Visit by Race/Ethnicity and Gender Georgia 2010

	No Tooth Extracted[a] % (CI)	Any Tooth Extracted[b] % (CI)	All Teeth Extracted[c] % (CI)	Visited a dentist in last year[d] % (CI)
Race				
Non-Hispanic white	60 (58-62)	40 (38-43)	19(17-22)	73(71-75)
Non-Hispanic black	45 (41-49)	55 (51-59)	28(21-35)	63 (59-66)
Hispanic	64 (56-74)	36 (26-46)	N/A	N/A
Other	N/A	N/A	N/A	N/A
Gender				
Male	57 (54-60)	43 (40-46)	19 (15-23)	68.3 (65-71)
Female	56(54-58)	44(42-46)	22 (20-25)	72 (70-74)
Income				
<$15, 000	31(24-37)	70(63-76)	37(29-44)	39(32-45)
$15,000-24,999	44(38-49)	56(51-62)	35(29-41)	51(46-56)
$ 25,000-34,999	39(33-45)	61(56-67)	24(17-31)	60(55-66)
$ 35,000-49,999	50(45-56)	50(44-55)	12 (7-17)	68(63-73)
$ 50,000 +	71(69-74)	29(26-31)	5 (2-8)	85(83-87)
Total	56(55-58)	44(42-45)	21(19-23)	70(68-72)

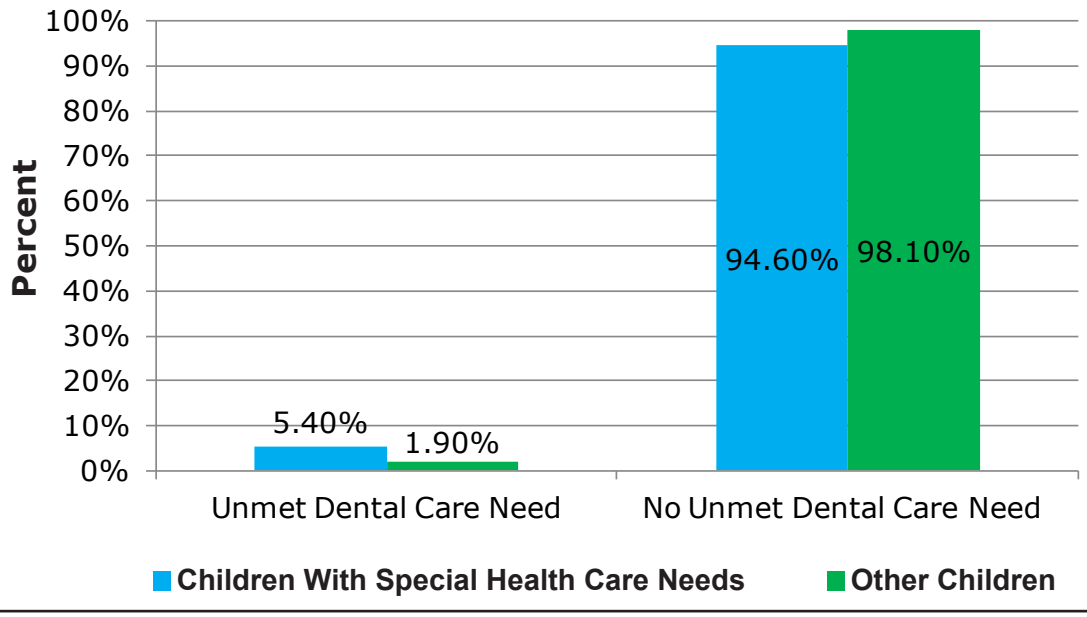
a: Adults 18 years and older who have not had any tooth extracted excluding third molar
b: Adults 18 years and older who have had any tooth extracted excluding third molar
c: Adults 65 years and older who have had all their teeth extracted
d: Adults 18 years and older who had Visited the dentist or dental clinic within the past year for any reason

Source: Behavioral Risk Factor Surveillance System, Georgia 2010

Table 11: Percentage of Children with Special Health Care Needs Who Needed Preventive or Other Dental Care during the Past 12 Months, Georgia 2009-2010		
	Need for Preventive Care % (CI)	Need for Other Dental Care % (CI)
Gender		
Male	89.6 (86.3 - 93.0)	21.6 (16.9 - 26.3)
Female	86.9 (81.6 - 92.2)	27.1 (21.2 - 32.9)
Race/Ethnicity		
Non-Hispanic white	88.8 (84.8 - 92.7)	29.5(24.6 - 34.4)
Non-Hispanic black	89.0 (83.5 - 94.4)	16.8 (10.6 - 23.0)
Hispanic	77.5 (63.4 - 91.6)	22.5 (9.7 - 35.2)
Other	92.8 (83.7 - 100)	22.9 (6.4 - 39.4)
Insurance		
Private	90.9 (87.2 - 94.6)	28.6 (23.6 - 33.5)
Public	86.4 (80.8 - 91.9)	17.2 (11.0 - 23.4)
Public and Private	81.0 (65.6 - 96.3)	18.0 (4.9 - 31.1)
Uninsured	85.5 (68.7 - 100)	34.2 (13.2 - 55.1)
Household Income		
0-99% FPL*	81.8 (74.2 - 89.4)	16.5 (8.4 - 24.5)
100-199% FPL	84.4 (76.5 - 92.3)	18.4 (11.4 - 25.4)
200-399% FPL	91.4 (87.1 - 95.6)	30.1 (22.5 - 37.8)
400% FPL or Higher	95.2 (91.5 - 98.9)	30.1 (23.9 - 36.3)
Overall	88.4 (85.4 - 91.4)	24.0 (20.4 - 27.7)

Source: National Survey of Children with Special Health Care Needs. NS-CSHCN 2009-2010
* FPL: Federal Poverty Level

Figure 7. Unmet Needs for Dental Care Among Children With Special Health Care Needs* and Other Children, Georgia**

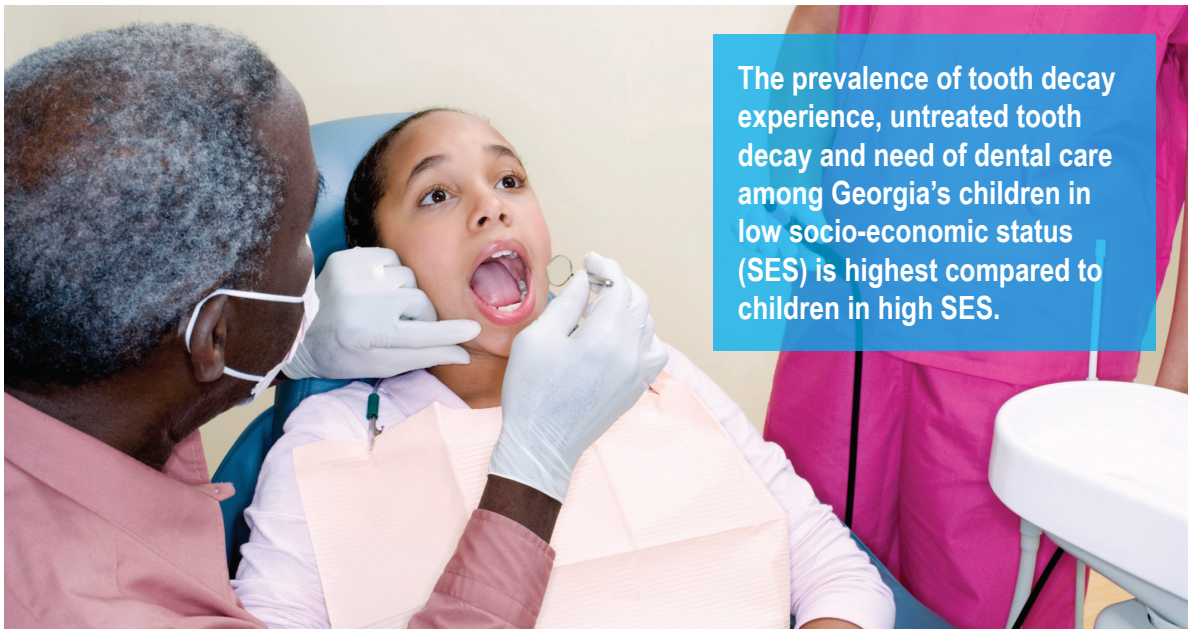


* Data source: National Survey of Children with Special Health Care Needs. NS-CSHCN 2009-2010
**Data source: National Survey of Children Health, NSCH 2007

C. Socioeconomic Disparities

People living in low-income families bear a disproportionate burden from oral diseases and conditions. For example, despite progress in reducing dental caries in the United States, children and adolescents in families living below the federal poverty level experience more dental decay than do children who are living above the federal poverty level. 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. Nationally, 50% of children ages 2 to 11 years in low income households have one or more untreated decayed primary teeth, compared with 31% of children in high income households.[8] Adolescents ages 12 to 17 years in low income households in each racial/ethnic group have a higher percentage of untreated decay in the permanent teeth than does the corresponding adolescent group in high income households. The pattern is similar in adults, with the proportion of untreated decayed teeth being higher among low income households than high income households. At every age, a higher proportion of those at the lowest income level than at the higher income levels have periodontitis. Adults with some college have 2 to 2.5 times less destructive periodontal disease than do adults with high school (15% vs. 28%) or adults with less than high school level of education (35%).[9] Overall, a higher percentage of Americans living below the poverty level are edentulous (have lost all their natural teeth) than are those living above the poverty level.[8] Among persons aged 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.[9] People living in rural areas also have a higher disease burden because of difficulties in accessing preventive and treatment services.

The 2011 3rd grade survey in Georgia indicated that the prevalence of tooth decay experience among children in low socioeconomic status (SES) is 50% higher than the prevalence of tooth decay among children in high SES. Similarly, the prevalence of untreated tooth decay and need of dental care among children in low SES was almost twice the prevalence among children in high SES. Fewer children in low SES had sealant on their teeth compared to children in high SES (**Table 8**). The 2007 National Survey of Children's Health (NSCH) data for Georgia showed that children in low income households had less dental visits for preventive

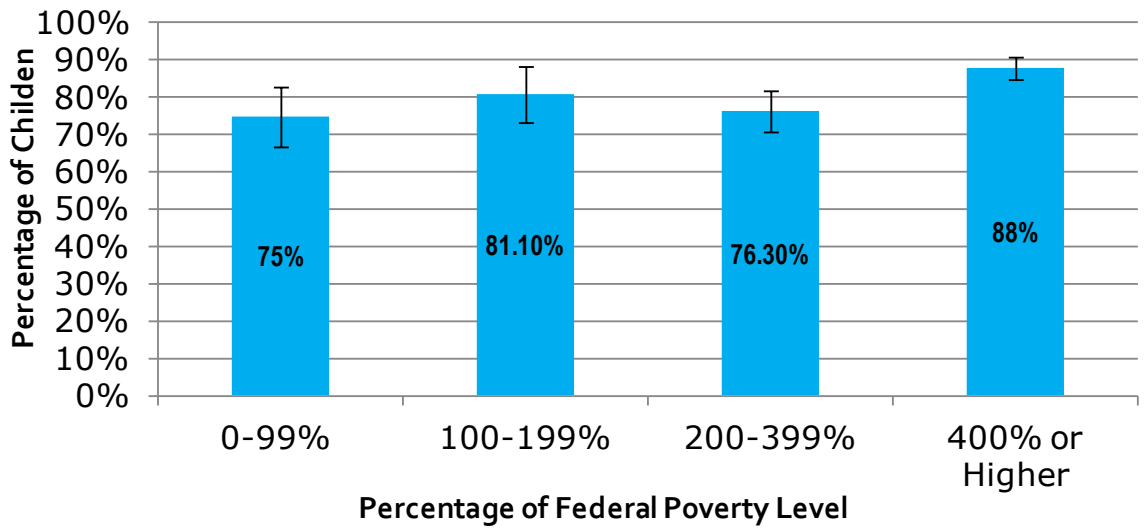


The prevalence of tooth decay experience, untreated tooth decay and need of dental care among Georgia's children in low socio-economic status (SES) is highest compared to children in high SES.

dental care such as check-ups and dental cleaning. Seventy-five percent of children in households whose income are within 100% of the federal poverty level had one or more preventive dental care visits within a 12 month period compared to 88% of children in households whose income are 400% or more of the federal poverty levels (**Figure 8**).

Among adults, oral health disparity is also pronounced with income level. Adults who earned $50,000 and more per year are significantly more likely to visit a dentist (85%) than adults with income less the $15,000 a year (39%) (**Table 10**).

Figure 8. Percentage of Children with One or More Preventive Dental Care Visits During the Past 12 Months by Household Income Level, Georgia 2007



Source: National Survey of Children's Health. NSCH 2007

VI. Access to Oral Healthcare

The Georgia Health Policy Center at Georgia State University[24] conducted a Health Insurance Survey in 2009 among Georgians and some of the results are presented in **Table 13**. This survey found that 15.9% of Georgians did not have any form of health insurance and 41.5% lacked dental insurance coverage. Adults 18 years and older were less likely to have dental insurance than children less than 18 years of age (45.2% vs. 33.2%). However, the proportion of children less than 18 years who have never had a dental visit (13.4%) was more than 7 times higher than the proportion of adults 18 years and older who had never had a dental visit (1.9%). The majority of Hispanics did not have dental insurance (52.5%), and almost half of American Indians /Alaskan Natives lacked dental insurance coverage (49.2%).

Education level and family income are determinant factors in access to oral health care. People with kindergarten level of education or less are almost 2 times more likely to lack dental insurance than people who graduated from college (75.8% vs. 38.3%). Consequently, people with a college degree or more are 2 times more likely to visit a dental office for any reason than people with no education above kindergarten level (89.6% vs. 45.3%).

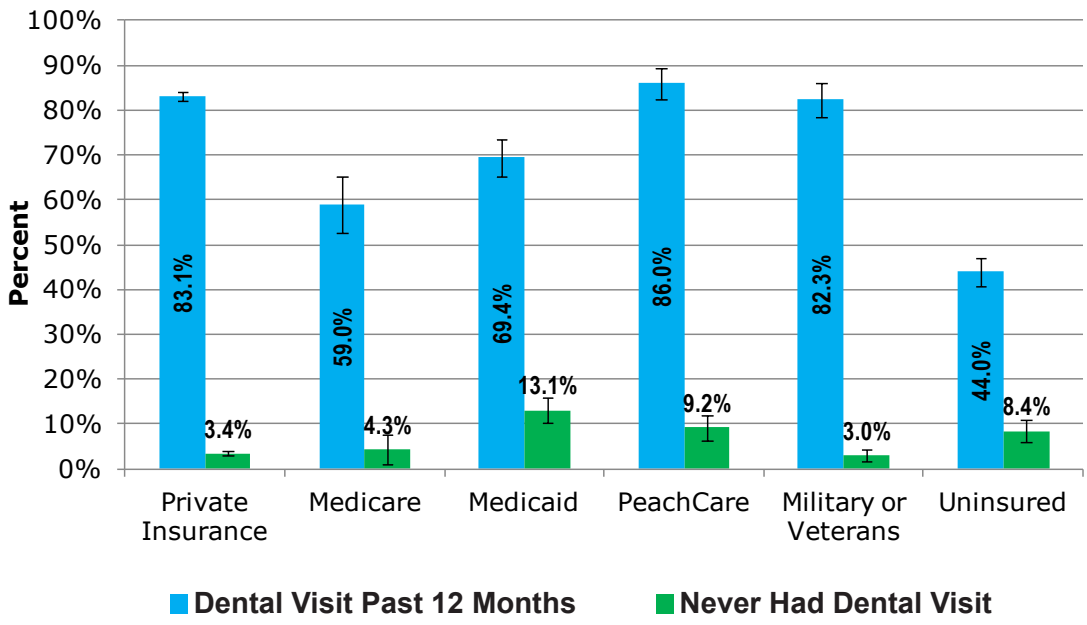
Access to oral health care is also related to family income. The majority of people in families with income less than 100% of the federal poverty level (FPL) (57.7%) did not have dental health insurance and only 62.9% of them had visited a dental office within a 12 month period. Among people with family income at 400% or more of the FPL, 30.4% did not have dental insurance and 84.5% had visited a dental office within the past 12 months. Most people (64.2%) were covered by private insurance, which is mainly employment-based. People with private insurance (83.1%) were more likely to visit a dental office than people with Medicaid (69.4%) or Medicare (59%) (**Figure 9**).

About 4.4% of Georgians reported not getting care or a delay in receiving care because they could not find a provider and 7.6% Georgians reported that they did not get care or received delayed care because they could not find a provider who accepted Medicaid or PeachCare.[24] Among people seeking health care (22.8%), a fourth (26%) were primarily searching for dental care. However, the main reason listed for not

Table 13. Percentage of People without Dental Insurance and Dental Visits by Socio-Demographic Characteristics, Georgia 2009			
	Lack of Dental Insurance % (CI)	Dental Visit During Last 12 Months % (CI)	Never Had Dental Visit % (CI)
Gender			
Male	41.5 (39.8, 43.2)	73.7 (72.2, 75.1)	5.8 (5.1, 6.7)
Female	41.5 (39.8, 43.2)	76.5 (75.1, 77.8)	5.1 (4.3, 6.0)
Age			
< 18 years	33.2 (30.6, 35.9)	81.0 (79.0, 82.9)	13.4 (11.9, 15.1)
> 18 years	45.2 (43.8, 46.7)	72.4 (71.2, 73.6)	1.9 (1.5, 2.4)
Race			
non-Hispanic white	42.4 (40.7, 44.1)	76.2 (74.9, 77.5)	5.1 (4.4, 5.9)
non-Hispanic black	39.5 (36.7, 42.4)	73.0 (70.6, 75.2)	5.6 (4.5, 6.9)
Asian	46.5 (34.6, 58.9)	74.9 (65.9, 82.2)	15.7 (9.5, 24.8)
Native Hawaiian/Other Pacific Islander	-θ	-θ	-θ
American Indian, Alaskan Native	49.2 (30.3, 68.3)	69.4 (53.0, 82.0)	3.3 (1.0, 10.6)
Other	36.2 (22.5, 52.6)	84.0 (69.1, 92.5)	8.2 (2.9, 21.3)
Ethnicity			
Hispanic	52.5 (45.4, 59.4)	69.8 (63.2, 75.7)	13.0 (8.7, 19.2)
non-Hispanic	40.6 (39.1, 42.0)	75.6 (74.5, 76.6)	4.8 (4.3, 5.4)
Education Level¥			
Kindergarten or less	75.8 (71.7, 79.6)	45.3 (40.7, 50.0)	3.8 (2.4, 5.9)
Elementary	51.5 (49.2, 53.9)	61.8 (59.6, 64.0)	2.8 (2.1, 3.7)
Some high school	43.0 (40.6, 45.5)	75.0 (72.8, 77.0)	1.3 (0.8, 2.0)
High school graduate	34.3 (31.6, 37.1)	83.3 (81.1, 85.3)	1.5 (0.6, 3.3)
Some college or technical school	34.7 (30.8, 38.8)	88.2 (85.2, 90.7)	1.1 (0.5, 2.3)
College graduate, Professional Degree	38.3 (30.3, 47.0)	89.6 (83.7, 93.5)	0.4 (0.1, 1.5)
Marital Status¥			
Widowed, Separated, or Divorced	56.1 (52.9, 59.3)	63.4 (60.3, 66.4)	2.4 (1.5, 3.6)
Never been married	56.8 (53.8, 59.7)	67.1 (64.2, 69.9)	2.1 (1.3, 3.4)
Currently married	38.8 (37.0, 40.7)	76.3 (74.8, 77.8)	1.7 (1.2, 2.3)
Living with a partner	52.8 (43.9, 61.5)	61.8 (53.0, 69.9)	3.2 (1.5, 6.7)
Family Income compared to FPL			
Less than 100%	57.7 (54.1, 61.2)	62.6 (59.5, 65.6)	9.5 (7.9, 11.4)
100% to 199%	54.2 (50.0, 58.4)	64.9 (61.4, 68.2)	6.4 (5.0, 8.2)
200% to 299%	42.1 (38.3, 45.9)	72.8 (69.8, 75.5)	5.2 (4.0, 6.8)
300% to 399%	35.1 (31.3, 39.1)	80.5 (78.0, 82.7)	3.9 (3.0, 5.2)
400% or more	30.4 (28.2, 32.6)	84.5 (82.8, 86.0)	3.7 (2.7, 5.1
Total	41.5 (40.0, 43.0)	75.1 (74.0, 76.2)	5.5 (4.8, 6.2)

-θ: Insufficient numbers for stable estimate

Figure 9. Percentage of People Who Had or Never Had Dental Visit By Insurance Type, Georgia 2009



¥: the estimates are for adults above 18 years

Source: Georgia Health Insurance Survey, Georgia State University, 2009

Source: Georgia Health Insurance Survey, Georgia State University, 2009

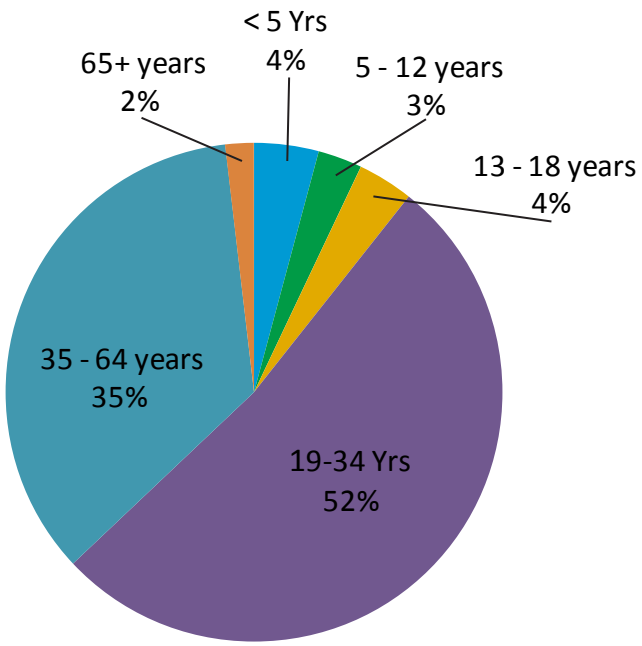
Emergency Room Services

The lack of dental insurance and access to oral health care is reflected in the usage of the emergency room (ER) for non-traumatic oral health problems. In 2010 alone, 71, 075 Georgians visited emergency departments for non-traumatic oral health problems.

Eighty-nine percent of the patients visiting the ER for oral health problems were adults 19 years and older (88%) **(Figure 10)**.

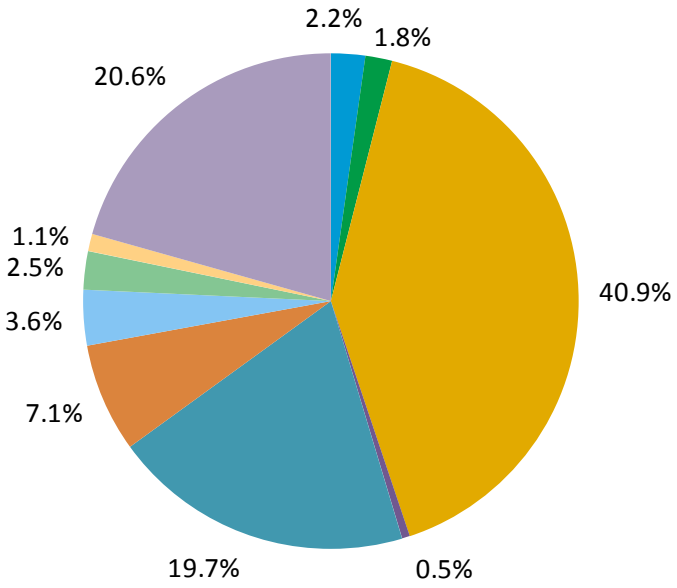
The number had been increasing over the years. Ninety percent of the oral diseases or conditions for which patients went to the ER could have been prevented by an early visit to the dental office (**Figure 11**). The associated costs for these visits were $37,237,318, an increase of more than $5 million from the previous year (**Figure 12**).

Figure 10. Proportion of Patients Visiting ER for Non-Traumatic Oral Diseases By Age, Georgia 2010



Source: Office of Health Indicators and Planning

Figure 11. ER Visits for Non-Traumatic Oral Diseases by Type of Pathology, Georgia 2010



- Dentofacial anomalies, including maloccusion
- Diseases of the salivary glands
- Other diseases and conditions of the teeth and supporting structures
- Diseases and other conditions of the tongue
- Diseases of pulp and periapical tissues
- Diseases of the oral soft tissues, excluding lesions specific for gingiva and tongue
- Gingival and periodontal diseases

Source: Office of Health Indicators and Planning

Medicaid/PeachCare Services

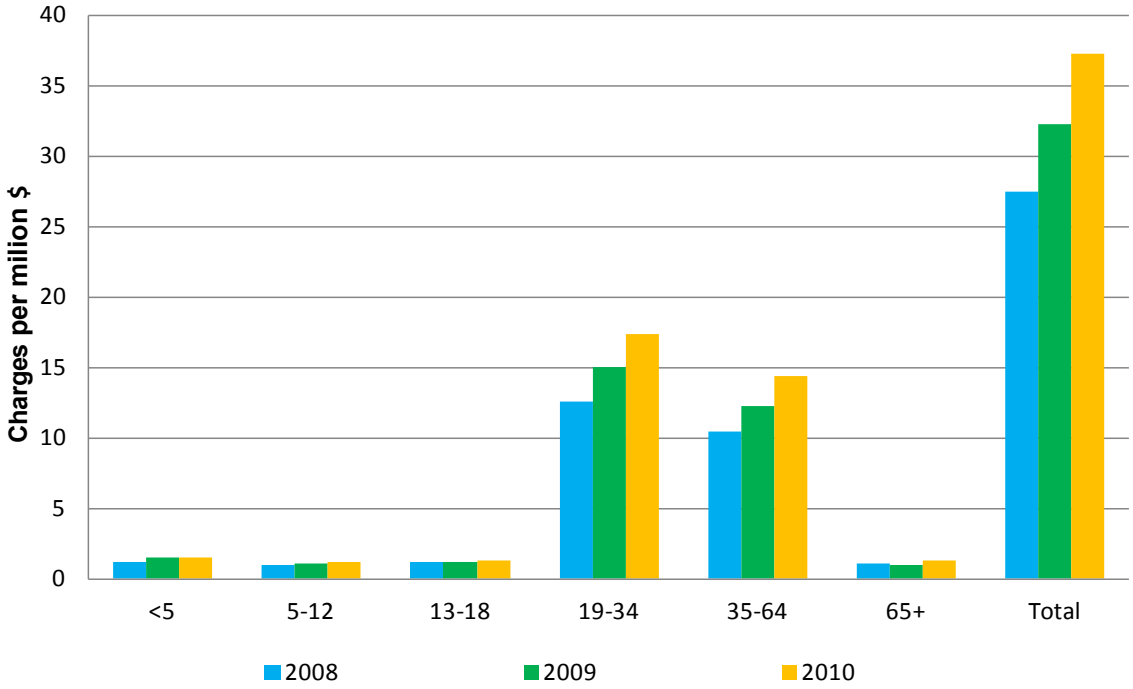
Medicaid provides health care services for low income adults and children, pregnant women, elderly and disabled. Medicaid is the primary resource for dental care among adults in low income households.[25] However, Medicaid coverage for adult dental services is optional for states. In Georgia, dental benefits for adults enrolled in Medicaid is limited to emergency services only[25] and does not cover preventive or other necessary dental services. Dental benefits for pregnant women include routine preventive and treatment services. Children on Medicaid/ PeachCare have dental insurance coverage for routine dental care. Orthodontics and more extensive care such as root canal therapy for permanent molars are covered only after justification of the need.

In 2006, Georgia implemented a managed care delivery system for Medicaid benefits and the majority of Medicaid and PeachCare patients are enrolled into managed care programs. "Georgia Families" was created and is a partnership between the Georgia Department of Community Health (DCH) and private care management organizations (CMOs) to deliver health care services to members of Medicaid and PeachCare.[26]

The CMOs are expected to maintain a sufficient number of providers to deliver services to the members of the two programs. DCH evaluates the CMO provider networks and network development activities to determine the level of accessibility. DCH also evaluates the network scope within the applicable region to ensure that each CMO has met the established accessibility standards for the scope of services required for Georgia Families members. The networks are evaluated at the regional and county level on a quarterly basis, and the CMO must meet the geographic access standards, by county, for 90% of its assigned members. For dental care, a provider has to be accessible within thirty minutes or a thirty mile radius in an urban area, and within 45 minutes or miles in the rural part of the state.

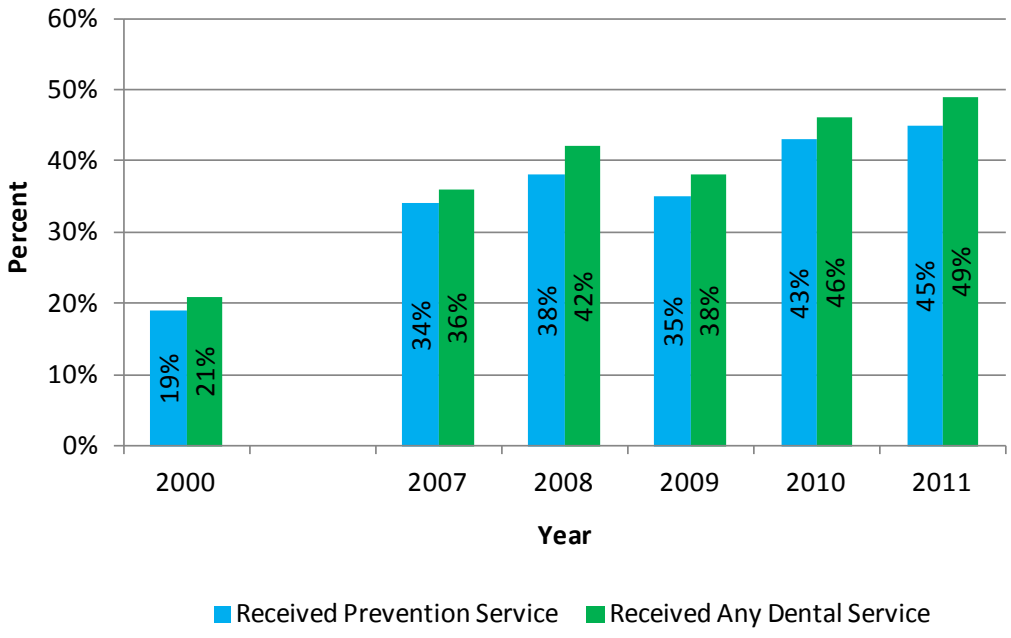
The number of children receiving preventive dental care and any dental care has increased significantly in recent years. Although Medicaid and PeachCare-eligible children still obtain far less dental care than higher income children, Georgia has improved access for this population over the last decade. The proportion of Medicaid children receiving at least one preventive dental visit increased 136% from 2000 to 2011, and the proportion of children receiving any dental service increased 133% during the same time period (**Figure 13**). However, in 2011 only 12% of the total eligible children 6-14 years of age received a sealant on a permanent molar.[27]

Figure 12. Total Charges by Age and Year for Non-Traumatic Dental Visits to ER, Georgia 2008-2010



Source: Office of Health Indicators and Planning

Figure 13. Percentage of Children Receiving Preventive and Any Dental Service By Year, Georgia 2000-2011



Source: EPSDT CMS Form 416

VII. Dental Care Provider Workforce and Distribution

According to the Georgia Board of Dentistry, as of September 2012, there were 5,515 active licensed dentists and 6,761 licensed dental hygienists in the state, representing one dentist per approximately 1,700 population (**Table 14**). However, dental care providers are distributed unevenly across the state; most dentists are concentrated in large cities and towns.

As of December 2009, Georgia ranked #39 among all states in dentists per capita (0.6 dentists/1000 persons), tied with 10 other states: Texas, South Dakota, North Carolina, New Mexico, Missouri, Maine, Louisiana, Indiana, Delaware, and Alabama.[28]

There is only one dental school in Georgia which graduates approximately 60 students per year. The school is pursuing efforts to build a new facility and anticipate graduating over 100 dentists per year. There are currently 14 dental hygiene schools in Georgia.

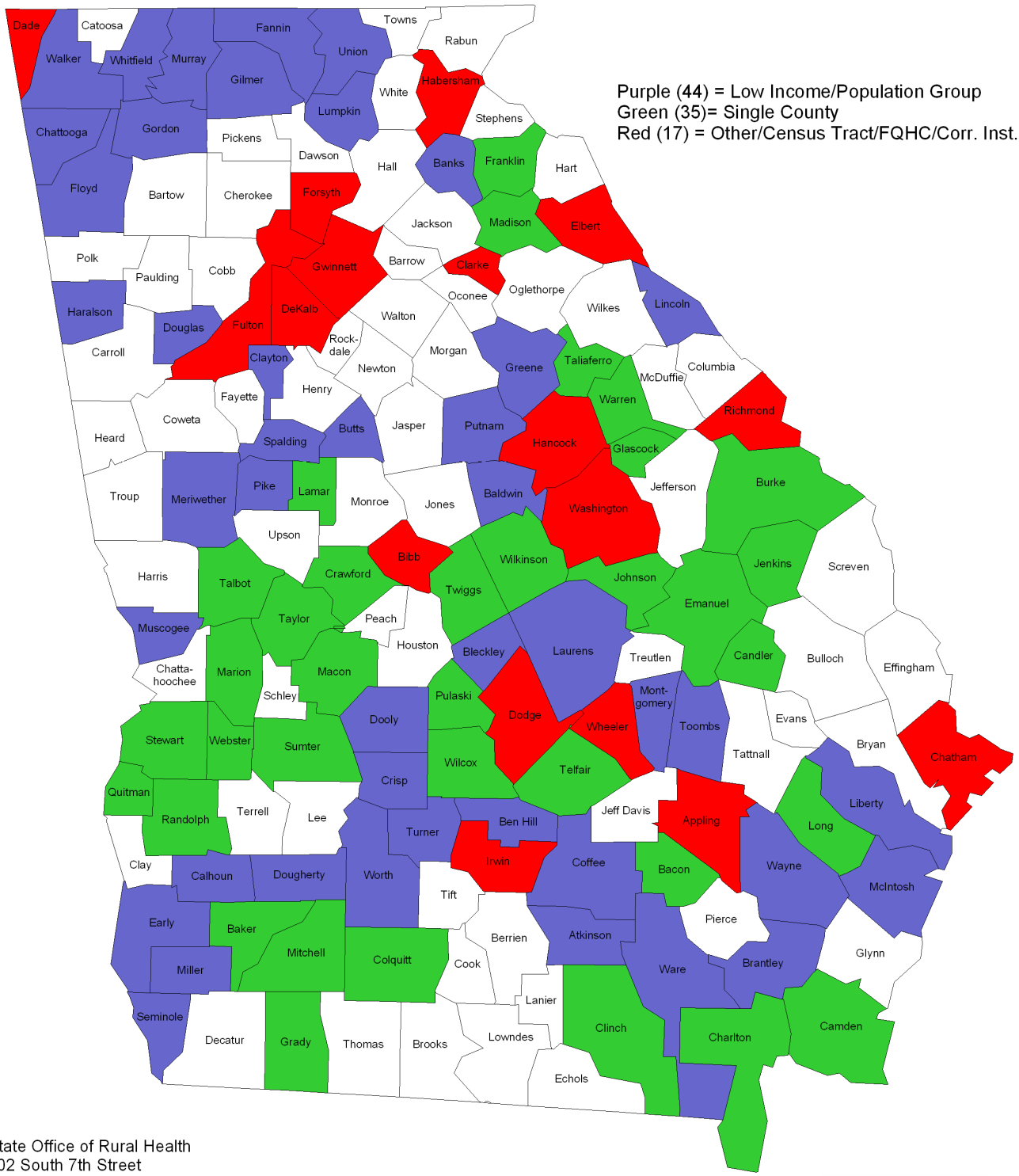
Table 14. Dental Workforce (active licensees) in Georgia

Number of Active Licensees as of 9/8/2012	
Type	**Count**
Dentist	5,515
Public Health	3
Dental Faculty	70
Dental Hygienist	6,761
Dental Hygiene Faculty	15
General Anesthesia Permit	241
Conscious Sedation Permit	243
Temporary Dental Hygienist	3
Volunteer Dental	3
Enteral/Inhalation Conscious Sedation	287

Source: Georgia Board of Dentistry

As of March, 2012, 35 single counties and 44 low-income group populations have been identified as dental health professional shortage areas in Georgia (**Figure 14**).[29]

Figure 14. State of Georgia Dental Health Professional Shortage Areas (DHPSA's)



Purple (44) = Low Income/Population Group
Green (35)= Single County
Red (17) = Other/Census Tract/FQHC/Corr. Inst.

State Office of Rural Health
502 South 7th Street
Cordele, GA 31015
Ph: 229-401-3090
Source: http://www.hrsa.gov
March 27, 2012

VIII. Protective and Risk Factors Affecting Oral Diseases

A. Protective Factors

Most common oral diseases and conditions can be prevented. Safe and effective measures are available to reduce the incidence of oral diseases, reduce disparities, and increase quality of life. The two most effective community preventive interventions for dental decay are community water fluoridation and school-based sealant programs. These measures have been recommended by the U.S. Centers for Disease Control and Prevention (CDC) as evidence-based and cost-effective based as supported by several systematic reviews.[30]

A.1 Community Water Fluoridation

In 2010, CDC reported that 92% of the Georgians on public community water systems receive the benefits of fluoridated water. Community water fluoridation (CWF) has been recognized by CDC as one of 10 great public health achievements of the 20th Century.[31] Fluoridating a community's water is the single most effective and efficient means of preventing tooth decay in children and adults regardless of age, race or income. Water fluoridation has been shown to be both highly cost-effective and socially equitable in improving the health of communities by reaching all minority groups, and the economically disadvantaged, as well as the affluent. Georgia has over 340 public community water systems that provide fluoridation to approximately 8.9 million Georgia citizens.[30]

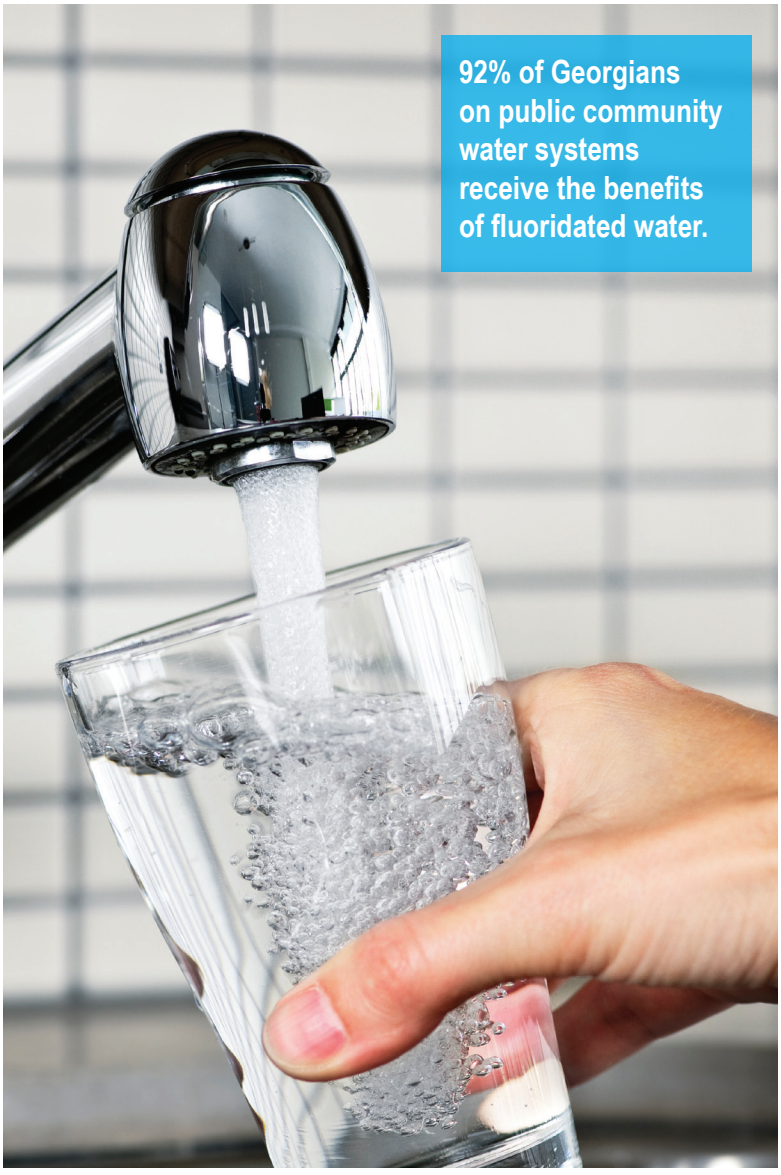
Community water fluoridation was mandated for all public community water systems in 1973 and the optimal concentration of fluoride in water available to Georgia consumers was set at 0.85 ppm (0.85 part fluoride to one million parts of water) with a lower limit of 0.7 ppm, and an upper limit of 1.0 ppm. It is only through maintaining the recommended average (0.85 ppm) that Georgia citizens receive the maximum reduction in tooth decay. HP2010 Objective 21-9 sets the national target for fluoridated public community water systems at 75%. Georgia has surpassed the national target, and ranks 11th among all states in community water fluoridation. To maintain the success of water fluoridation in Georgia, continued funding of the CWF program is necessary. This has been accomplished through federal funding sources such as the Preventive Health and Health Services Block Grant and Maternal and Child Health Block Grant.

The goal of the Georgia Oral Health Program (GOHP) in the Maternal and Child Health (MCH) section is to maintain or increase the proportion of Georgians served by optimally fluoridated water systems above 92%. The Georgia Department of Public Health contracts with the Georgia Rural Water Association to train water plant operators in fluoridation procedures and public health benefits, provide technical assistance, and inspect water plant operations to ensure they meet CDC Engineering and Administrative Recommendations for Water Fluoridation (EARWF) standards. They also collaborate with the Georgia Public Health Laboratory to monitor fluoride levels, and ensure that fluoridation information is recorded in CDC's Water Fluoridation Reporting System (WFRS).

In the early 1900's, dental infections were the 5th-6th leading causes of death.[32] Water fluoridation began in the U.S. in 1945, and became mandatory in Georgia for public, community water systems in 1973.[33] Dental decay rates have decreased from 40-70% since fluoridation started in the 1940's. Even with the widespread use of fluoride toothpaste and rinses, fluoridated communities still have about 20% less tooth decay than those that don't fluoridate.[31]

CDC and the University of Georgia have conducted a study that showed that water fluoridation saves about $19 per person per year in dental care costs.[34] An increase of 3% in the population receiving water fluoridation amounts to about 271,600 more people and a savings of $5.16 Million per year in dental expenses for Georgia.

The GOHP collaborates with the Georgia Rural Water Association and the Georgia Public Health Laboratory to maintain the quality and continued success of Georgia's community water fluoridation program.



A.2. Topical Fluorides and Fluoride Supplements

The most effective use of topical fluoride is frequent exposures at low concentrations every day, producing the greatest risk reduction for dental caries in all age groups. It is recommended that all people drink water with an optimal fluoride concentration and brush their teeth twice daily with fluoride toothpaste.[35] For communities without optimally fluoridated water or persons at high risk of dental caries, additional fluoride measures are recommended. Public health measures include fluoride mouth rinse or tablet programs, typically conducted in schools. Individual measures include professionally applied topical fluoride gels or varnish for persons at high risk of caries.

A .2.1 School Fluoride Program

The GOHP has a school program that offers supplemental fluoride tablet & rinse to children in elementary schools. To qualify for participation, an elementary school must have at least 40% of its student population eligible for the Federal Free and Reduced Lunch program (FRL). FRL is commonly used as a proxy for low-income students.

During State Fiscal Year (SFY) 2010, over 16,000 children were served by local health departments in receiving these fluoride supplemental programs.

A.2.2 Fluoride Varnish

Fluoride varnish is a highly concentrated form of fluoride applied to the surfaces of teeth, where it adheres for several months. Fluoride varnish has been demonstrated to be clinically effective in reducing the incidence of caries.[36] Currently, 25 states provide Medicaid coverage for oral health screenings and fluoride varnish applied in the medical setting by non-dental health providers. Georgia has recently joined these states by allowing reimbursement for fluoride varnish applied by physicians, physician assistants, nurse practitioners, and registered nurses. This is a positive step towards increasing children's access to preventive oral health services, and therefore decreasing the incidence of tooth decay among moderate to high-risk children, especially those less than five years of age.

During SFY 2010, over 3,000 children received fluoride varnish applications through the oral health prevention program in elementary schools and Head Start facilities.

The majority of oral diseases are highly preventable. The combination of dental sealants and fluoride has the potential to nearly eliminate tooth decay in school-age children.

A.3. Dental Sealants

Since the early 1970s, the incidence of childhood dental caries on smooth tooth surfaces (those without pits and fissures) has declined markedly because of widespread exposure to fluorides. Most dental decay among school-age children now occurs on tooth surfaces with pits and fissures, particularly the molar teeth.[37]

Pit-and-fissure dental sealants (thin plastic coatings bonded to the susceptible tooth surfaces) have been approved for use for many years and have been recommended by professional health associations and public health agencies. First permanent molars erupt into the mouth at about age 6 years. Placing sealants on these teeth shortly after their eruption protects them from the development of dental decay in areas of the teeth where food and bacteria are most likely to be retained. If sealants were applied routinely to susceptible tooth surfaces in conjunction with the appropriate use of fluoride, most tooth decay in children could be prevented.[38]

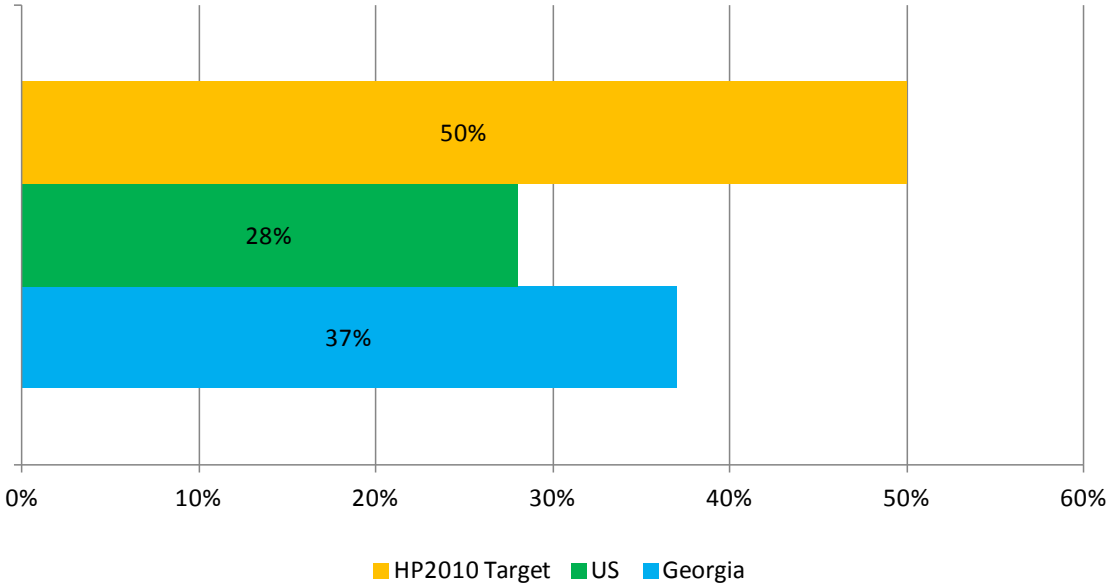
Second permanent molars erupt into the mouth at about age 12 to 13 years old. Pit-and-fissure surfaces of these teeth are as susceptible to dental caries as the first permanent molars of younger children. Therefore, young teenagers need to receive dental sealants shortly after the eruption of their second permanent molars.

A.3.1 Prevalence of Dental Sealants

The HP2010 target for dental sealants is 50% for 8 year-olds and 14 year-olds. The national average of 8 year-olds with a sealant on their molar is 23% and 15% for children 14 year-old. In Georgia as in most states, there are no data for the 14 year-olds.

The 3rd grade children survey in Georgia in 2011 found that about 37% of 3rd grade children had dental sealants (**Figure 15**). The prevalence of dental sealant was lowest among non-Hispanic black children and children eligible for the FRL program. The prevalence of sealants among children also varies by the education level of the head of household (**Table 15**).

Figure 15. Proportion of Sealant on Molar Among Georgia's 3rd Grade Children Compared to 8 Year-Old Children in the US and HP2010 Objective



Source: Georgia's 2011 3rd Grade Survey; NHANES 1999–2000

Table 15. Percentage of Children in United States and Georgia with Dental Sealants on Their Molars, by Age and SES Characteristics		
Demographic and Social Characteristic	Dental Sealants on Molars	
	United States, 8-year-olds (%)	Georgia, 3rd graders (%)
Healthy People 2010 Target	50	50
Current Status (Aggregate)	28	37
Race or ethnicity		
Non-Hispanic black	16 [c]	29 [a]
Non-Hispanic white	21 [c]	43 [a]
Gender		
Male	20 [c]	37 [a]
Female	20 [c]	38 [a]
Socioeconomic Status		
High SES	17 [b]	43 [a]
Low SES	12 [b]	34 [a]

*National data are from NHANES 1999–2000 unless otherwise indicated.
a: Data are for Georgia 3rd grade survey, 2011.
b: Data are from NHANES III, 1988–1994.
c: Data are from NHANES, 2005-8.
Source: Healthy People 2010, Progress Review, 2000. U.S. Department of Health and Human Services. Available at www.cdc.gov/nchs/ppt/hpdata2010/focusareas/fa21.xls

A.3.2 School-based Dental Sealant Programs

The U. S. Task Force on Community Preventive Services documented a 60% decrease in dental caries on the chewing surface of molar teeth up to five years after sealant application. This Task Force strongly recommended school-based or school-linked sealant programs for the prevention and control of dental caries.[39] School-based or school-linked sealant programs are considered very cost-effective measures, [40] and can reach low-income children who otherwise would not receive them.

In Georgia, the Dental Public Health Sealant Program Guidelines recommend that schools with more than 50% low-income children (eligible for FRL), be targeted for sealant programs. These guidelines also assist health professionals and schools in other aspects of planning, implementing, and evaluating school-based sealant programs.

A.4. Preventive Visits

Maintaining good oral health takes repeated efforts on the part of the individual, caregivers, and health care providers. Daily oral hygiene routines and healthy lifestyle behaviors play an important role in preventing oral diseases. Regular preventive dental care can reduce the development of disease and facilitate early diagnosis and treatment. HP2010 includes a target of 57% for low-income children and adolescents to receive any preventive dental service during the past year.

Tooth decay is not the only reason for a dental visit. For example, a child may need additional fluoride, dietary changes, or sealants for ideal oral health. In addition, the pediatric dentist may identify orthodontic problems and suggest treatment to guide the teeth as they erupt in the mouth.

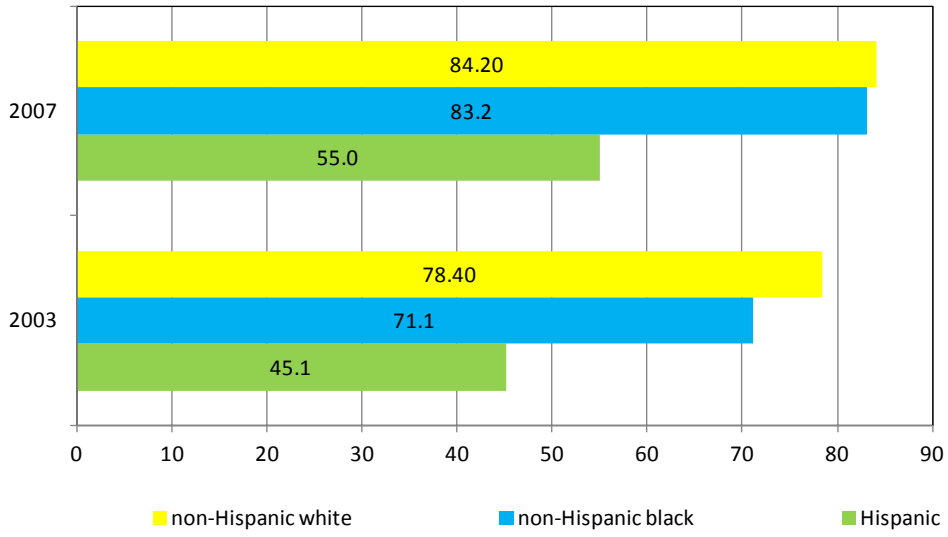
The American Academy of Pediatric Dentistry (AAPD) recommends a dental check-up every six months, starting at the eruption of the first tooth. According to the AAPD: regular dental visits help a child

stay cavity-free; regular cleanings remove debris that build up on the teeth, irritate the gums, and cause decay; fluoride treatments renew the fluoride content in the enamel, strengthening teeth and preventing cavities; and hygiene instructions improve a child's brushing and flossing, leading to cleaner teeth and healthier gums.[41,42]

One measure of preventive care is the percentage of adults who had their teeth cleaned in the past year. Professional cleaning at regular intervals may inhibit caries on all tooth surfaces. Having one's teeth cleaned by a dentist or dental hygienist is indicative of preventive behaviors. The National Survey of Children's Health showed an increase of preventive dental care among children 1-17 years of age among non-Hispanic white, non-Hispanic black and Hispanic in Georgia from 2003 to 2007 (**Figure 16**).

Studies show that it is safe for pregnant women to visit dentists and have their teeth cleaned. There is a need to inform physicians, dentists, and pregnant women about the importance of dental visits during pregnancy.[43]

Figure 16. Children 1-17 years receiving at leat one Preventive Dental Care by Race/Ethnicity, Georgia 2003,2007



Source: National Survey of Children's Health, 2003,2007

A.5. Oral Health Education

Oral health education for the community is a process that informs, motivates, and helps people to adopt and maintain beneficial health practices and lifestyles; advocates environmental changes as needed to facilitate this goal; and conducts professional training and research to the same end.[44] Although health information or knowledge alone does not necessarily lead to desirable health behaviors, knowledge may help empower people and communities to take action to protect their health.

The exchange of information and the opportunity to educate patients is an everyday part of dental practice. The amount of information that is understood and retained by patients and/or their parents/caregivers is not known. However, the improvements of dental hygiene, as well as education directed at dietary modifications, are considered important measures in dental health education and oral disease outcomes.[45, 46]

Georgia Public Health dental hygienists teach school children the importance of proper brushing, flossing, and good nutrition for good dental health. More than 66,378 Georgia school children received comprehensive oral health education in fiscal year 2008.

B. Risk Factors

Tobacco and Alcohol

Oral cancer detection is accomplished by a thorough examination of the head and neck; an examination of the mouth including the tongue, the entire oral and pharyngeal mucosal tissues, and the lips; and palpation of the 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.[47,48] If suspicious tissues are detected during an examination, definitive diagnostic tests, such as biopsies, are needed to make a firm diagnosis.

Oral cancer is more common after the age of 60 years. Known risk factors include use of tobacco products and alcohol. The risk of oral cancer is increased 6 to 28 times in current smokers. Alcohol consumption is an independent risk factor and, when combined with the use of tobacco products, accounts for most cases of oral cancer in the United States and elsewhere.[49] Individuals should also be advised to avoid other potential carcinogens, such as exposure to sunlight (a risk factor for lip cancer) without protection (use of lip sunscreen and hats is recommended).

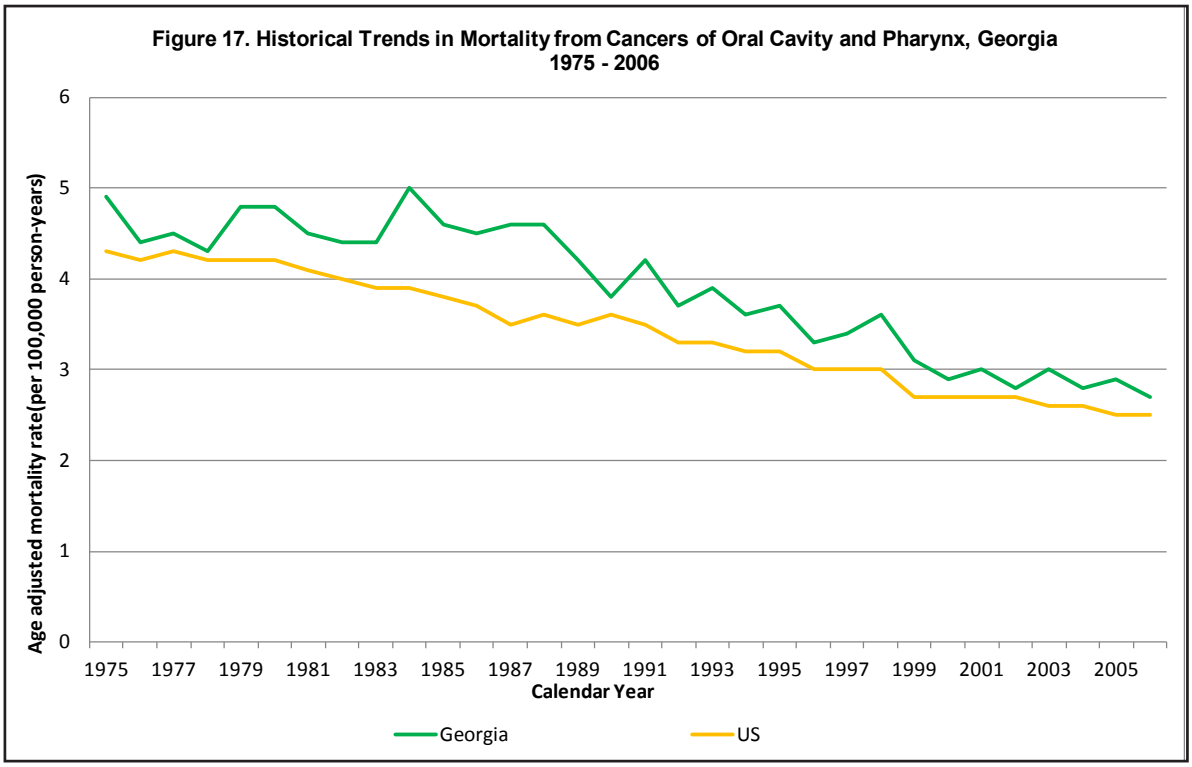
Tobacco and alcohol use are known risk factors for oral diseases including periodontal diseases and oral cancers.[50-53] Often this habit is developed during early adolescence. Therefore, monitoring the prevalence of these risk behaviors is important for prevention.

Tobacco use has a devastating effect on the health and well-being of the public. More than 400,000 Americans die each year as a direct result of cigarette smoking, making it the nation's leading preventable cause of premature mortality, and smoking causes over $150 billion in annual health-related economic losses.[54] The effects of tobacco use on the public's oral health are also alarming. The use of any form of tobacco — including cigarettes, cigars, pipes, and smokeless tobacco — has been established as a major cause of oral and pharyngeal cancer.[49] The evidence is sufficient to consider smoking a causal factor for adult periodontitis;[49] one-half of the cases of periodontal disease in this country may be attributable to cigarette smoking.[55] Tobacco use substantially worsens the prognosis of periodontal therapy and dental implants, impairs oral wound healing, and increases the risk of a wide range of oral soft tissue changes.[56]

Major risk factors for oral cancer include the use of tobacco products and alcohol. Five-year survival rates are greater with early cancer diagnosis.

The dental office provides an excellent venue for providing tobacco intervention services. More than one-half of adult smokers see a dentist each year.[55] Dental patients are particularly receptive to health messages at periodic check-up visits and oral effects of tobacco use provide visible evidence and a strong motivation for tobacco users to quit. Because dentists and dental hygienists can be effective in treating tobacco use and dependence, the identification, documentation, and treatment of every tobacco user they see needs to become a routine practice in every dental office and clinic.[57] However, national data from the early 1990s indicated that just 24% of smokers who had seen a dentist in the past year reported that their dentist advised them to quit, and only 18% of smokeless tobacco users reported that their dentist ever advised them to quit.

The incidence and mortality rates of oral cancer have decreased in recent years both nationally and in Georgia since 1975 (**Figure 17**). A similar decline observed in the prevalence of smoking among Georgians parallels the decrease in the oral cancer incidence rate. However, it is of concern that more teenagers (23.4%) are now smoking compared to adults (20.5%).



The recent YRBS survey indicated that 23.4% of high school students smoke or chew tobacco and 11.9% smoked their first cigarette before the age of 13 (**Table 16**). The trend in the last decade has been encouraging; fewer youngsters are practicing this risky behavior. From 1993 to 2009, the percentage of middle and high school students who smoked one or more cigarettes during the 30 days prior to the surveys dropped from 23.8% to 16.9% (**Figure 18**). However, teenagers appear to be more inclined to chewing tobacco which also increases the risk for oral cancer. Unfortunately, the proportion of high school students using smokeless tobacco has been increasing (**Figure 18**). Epidemiological and molecular data have strongly associated human papillomavirus (HPV) with oropharyngeal cancer,[58] most notably in the tonsillar area and the base of the tongue.[59] Data based on the anatomic sites of oral cancer suggest an increase in the incidence of cancer associated with HPV, despite the decline in the overall oral cancer incidence. Similar trends are also being reported at the national level. Trend analyses for these sites will be conducted using Georgia figures when more data is available. The majority of HPV-positive oral cancers are linked with the type 16 strain, and tend to occur in a younger age group that do not exhibit the "traditional" risk factors of tobacco and alcohol use associated with other oropharyngeal cancers.[58]

Table 16. Prevalence of Drinking and Tobacco Use Among Middle and High School Students, Georgia 2009

Behavior	Male % (CI)	Female % (CI)	Aggregate % (CI)
Youth tobacco users [a]			
High school students	28.3 (24.7 - 32.1)	19.0 (15.5 - 23.2)	23.4 (20.9 - 26.1)
Middle school students	13.7 (11.1 - 16.9)	5.9 (4.6 - 7.7)	9.9 (8.2 - 11.9)
Began smoking early [b]			
High school students	14.9 (12.7 - 17.4)	9.0 (6.9 - 11.7)	11.9 (10.5 - 13.4)
Middle school students	6.8 (4.6 - 10.1)	3.6 (2.5 - 5.0)	5.2 (3.9 - 7.0)
Alcohol drinkers/consumers [c1, c2]			
High school students	33.7 (29.5 - 38.1)	35.0 (31.0 - 39.1)	34.3 (30.9 - 37.8)
Middle school students	33.8 (29.7 - 38.1)	29.1 (24.4 - 34.4)	31.5 (27.8 – 35.5)
Began drinking early [d]			
High school students	23.8 (20.2 - 27.9)	17.5 (14.9 - 20.4)	20.7 (18.3 - 23.3)
Middle school students	16.1 (13.5 - 19.0)	12.1 (9.3 – 15.7)	14.1 (11.9 – 16.6)
Binge drinkers [e]			
High school students	20.7 (17.0 - 25.0)	16.9 (13.3 - 21.3)	18.8 (15.6 - 22.4)

a: Percentage of students who smoked cigarettes or cigars or used chewing tobacco, snuff, or dip on one or more of the past 30 days

b: Percentage of students who smoked a whole cigarette for the first time before age 13 and 11 years for high and middle school students, respectively

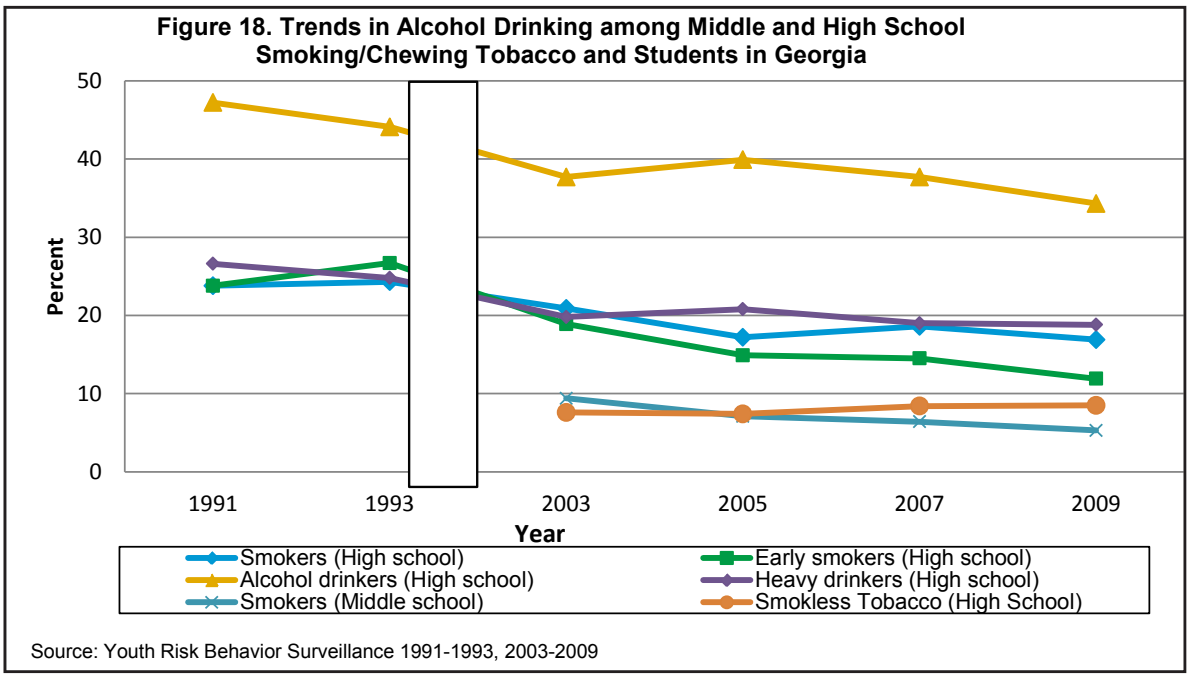
c1: Percentage of high school students who had at least one drink of alcohol on one or more of the past 30 days

c2: Percentage of middle school students who ever had a drink of alcohol, other than a few sips

d: Percentage of students who had their first drink of alcohol other than a few sips before age 13 and 11 years for high and middle school students, respectively

e: Percentage of students who had five or more drinks of alcohol in a row, that is, within a couple of hours, on one or more of the past 30 days

Source: Youth Risk Behavior Surveillance Survey, Georgia 2009



Smokers: Percentage of students who smoked cigarettes on one or more of the past 30 days

Alcohol drinkers: Percentage of students who had at least one drink of alcohol on one or more of the past 30 days

Smokeless tobacco: Percentage of students who used chewing tobacco, snuffs, or dips on one or more of the past 30 days

Early smokers: Percentage of students who smoked a whole cigarette for the first time before age 13 years

Heavy drinkers: Students who had five or more drinks of alcohol in a row, that is, within a couple of hours, on one or more of the past 30 days

According to the 2011 BRFSS survey results (**Table 17**) more than one in five adult Georgians (21%) are smokers, and 6% are heavy drinkers (consume more than one drink everyday).

Table 17. Prevalence of Drinking and Tobacco Use among Adults, Georgia BRFSS 2011

Behavior	Male % (CI)	Female % (CI)	Aggregate % (CI)
Every day smokers [a]	15.7 (13.9-17.6)	13.0 (11.6-14.3)	14.3 (13.2-15.5)
Some days smoker[b]	8.6 (7.0-10.2)	5.3 (4.4-6.1)	6.9 (6.0-7.8)
Heavy drinkers [c]	7.5 (6.0-8.9)	5.1 (4.2-5.9)	6.2 (5.4-7.1)
Binge drinkers [d]	22.5 (20.2-24.8)	11.1 (9.7-12.5)	16.6 (15.3-18.0)

Notes:
a: Percent of adults who are currently smoking cigarettes everyday
b: Percent of adults who are currently smoking cigarettes some days
c: Percentage of adult men having more than two drinks per day and adult women having more than one drink per day
d: Percentage of adult males having five or more drinks on one occasion, and adult females having four or more drinks on one occasion)

Source: Behavioral Risk Factor Surveillance System, Georgia 2011

IX. Georgia Dental Public Health Services

The mission of the Georgia Oral Health Program (GOHP) is to prevent oral disease among Georgia's children through education, prevention and early treatment.

The GOHP plays a vital role in improving the quality of life for all the children of Georgia, and in eliminating health disparities. Oral Health programs focus on preventing, controlling and reducing oral diseases and conditions as well as promoting healthy behaviors. Dental Public Health staff coordinates local, state, and federal resources to address the burden of oral disease and promote cooperative working relationships among state agencies and community organizations to, prevent and control oral diseases.

The state of Georgia is divided into 18 Public Health Districts, and all 18 districts throughout the state have some type of school-based or school-linked oral disease prevention program. At least one county dental public health clinic is present in 14 of the 18 districts, and of the 229 county health departments operating in Georgia, 42 have dental clinics (**Figure 19**). There are also 14 public health mobile dental units operating throughout the state (**Figure 20**). The number of dental clinics and the availability of services vary widely by district.

Education

- Dental Health Education
  - Public health dental hygienists teach school children the importance of proper brushing, flossing, and good nutrition for good dental health. More than 66,378 school children were reached in fiscal year 2010.

Screening and Referral

- Dental screenings
  - Dental inspections of the mouth are performed to see if there are any dental or oral problems. The most common dental problems that children have are dental decay, gum disease, and malocclusion. Most of these problems are preventable. Early diagnosis and prompt treatment can eliminate pain, infection, and progressive oral diseases. In 2011, 884,912 Children received dental screenings through dental public health programs in the state.[27]
- Dental referrals
  - If a child is found to have oral health problems, a referral note is sent to the parent/guardian regarding the child's condition and detailing available resources. A total of 73,640 school children were screened and referred for treatment in fiscal year 2011 through public health dental programs.[27]

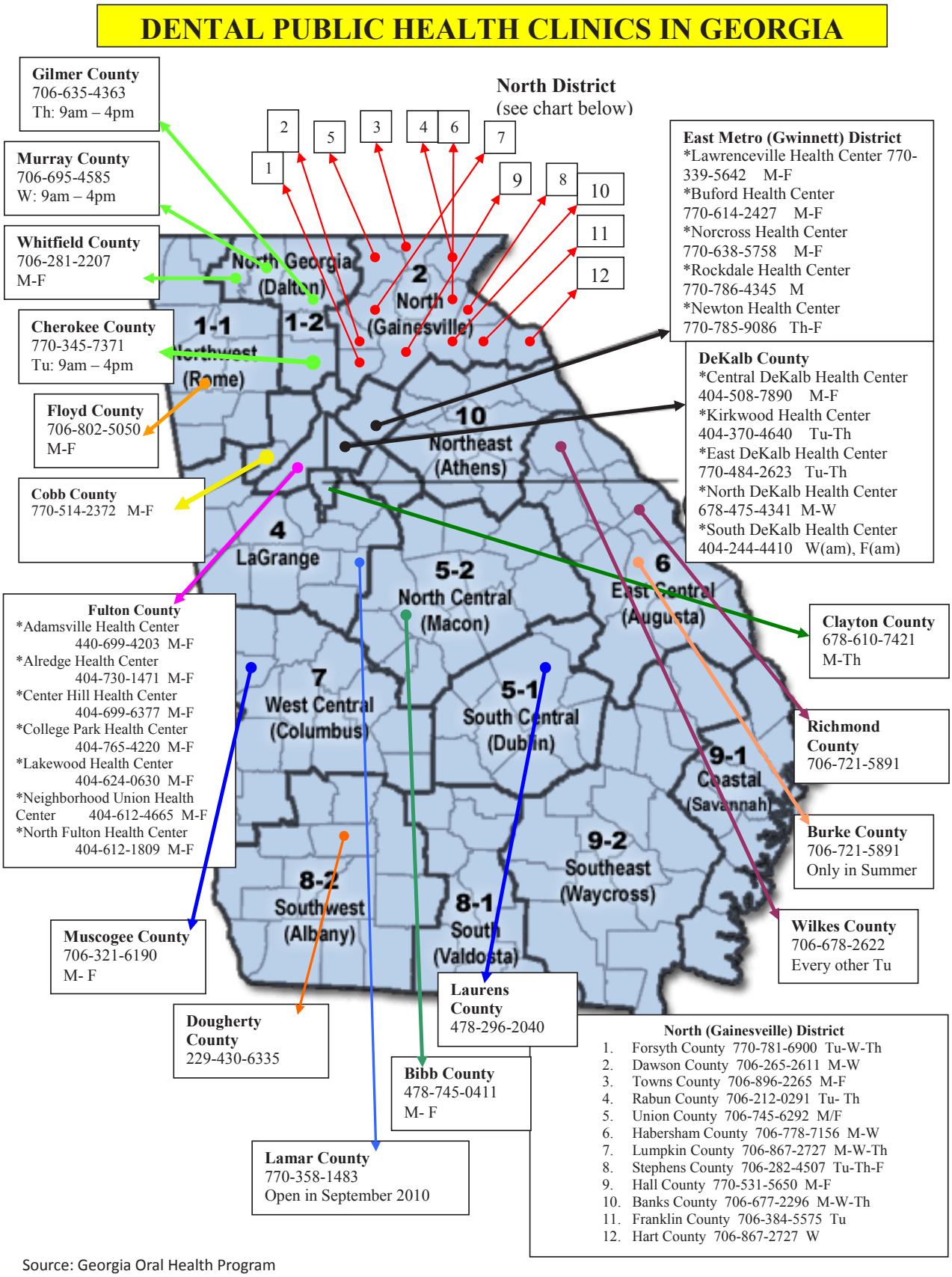
Treatment

- A total of 250,864 children received dental treatment services in fiscal year 2011.[27]
  - First priority for treatment is given to children who need emergency dental services because of pain or infection, and who are eligible for the Free and Reduced Lunch Program (185% Federal Poverty Level).
- Basic dental treatment services include:
  - Exams
  - Cleanings
  - Dental sealants
  - Silver (amalgam) and tooth colored (composite) fillings
  - Stainless steel crowns
  - Minor nerve treatments
  - Extractions
- Clinic locations and hours depend on local and state resources available. Information about specific dental services, hours, and location of services can be obtained by calling the local health department or the Health District Dental Contact.
- Payment for dental treatment services are based on a sliding fee scale based upon ability to pay. Many health departments have a minimal administrative fee.
- Public health dental services are provided to children who are enrolled in Medicaid and PeachCare programs, as well as to low-income patients on a sliding-fee scale (based on the patient's ability to pay).

The main dental public health services offered by the state are:

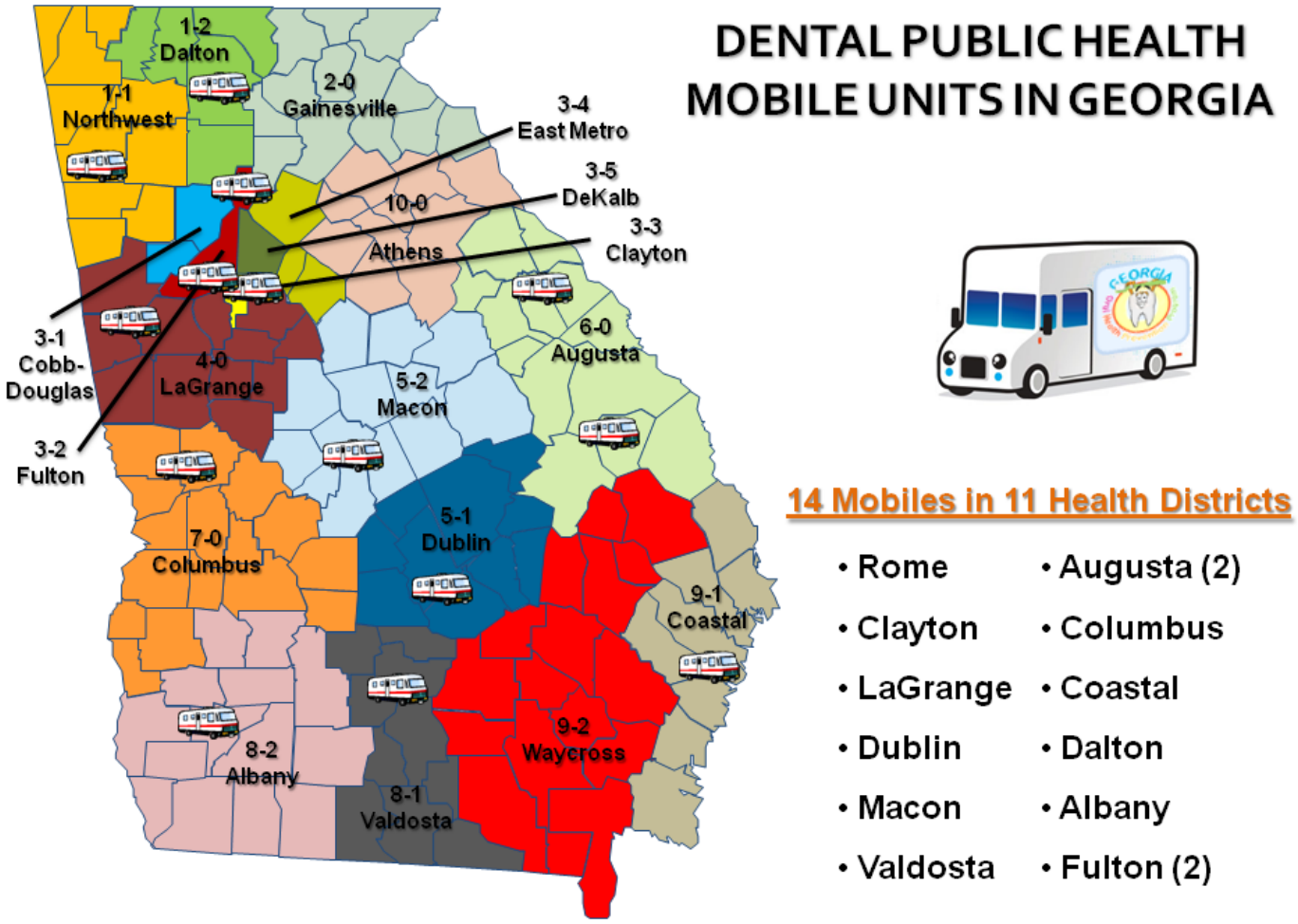
- Community Water Fluoridation
  - In 2010, 92% of Georgia's population using public water systems received fluoridated water.[60]
- School-linked Fluoride Supplement Programs for high-risk children
  - Fluoride mouth rinse or fluoride varnish treatments are provided to children lacking an adequate source of fluoride. Approximately 9,175 school age children received fluoride treatments as of April 2010.
- Dental Sealants
  - A plastic coating is placed on the chewing surfaces of permanent molar teeth to seal out food and bacteria that cause tooth decay. In fiscal year 2011, dental public health personnel placed 56,317 sealants on the permanent molars of Georgia children.

Figure 19. Dental Public Health Clinics in Georgia



Source: Georgia Oral Health Program

Figure 20. Location of Dental Public Health Mobile Units in Georgia



X. Conclusions

Oral diseases and conditions are common health problems and can affect everyone regardless of age, race or ethnicity and socio-economic status. However, the burden of oral diseases is unequally distributed across different subpopulation groups. This report assessed the characteristics of the burden of oral health disease and condition in Georgia and aimed to raise awareness of oral health and access to dental care. In light of the findings, Georgia has achieved some of the HP2010 oral health objectives, but there is still room to improve and achieve unmet objectives.

Ninety-two percent of Georgians who receive their water through public water system have fluoridated water, exceeding the 75% target of HP2010. Likewise, the proportion of children with untreated dental decay (19%) in the state exceeded HP2010 objective of 21%. For oral health indicator of no tooth extracted due to oral disease among adults 35- 44 years (67%) or lost of all natural teeth among older adult 65-74 years (21%), Georgia also met the HP2010 objectives of 40% and 22% respectively.

Georgia did not meet HP2010 objectives for dental caries experience in young children 2-5 years (11%) or children 6-11 years (42%). The state's proportion of young children 2-5 years with caries experience is 4 times higher than the HP2010 target, while the rate of caries experience among 3rd grade children is 24% higher than HP2010 objective. Other unmet targets include the proportion of children with sealant on their first molar (37% vs. 50%), early detection of oral and pharyngeal cancers (35% vs. 50%), and oropharyngeal cancer mortality (2.8% vs. 2.4%).

Like the national population, Georgia's population is disproportionately affected by oral health problems. Children of Hispanic ethnicity, rural areas and of low socioeconomic status experience a higher prevalence of tooth decay compared to non-Hispanic, urban areas and high socioeconomic level children. Non-Hispanic black children have significantly lower prevalence of sealant on their molar compared to non-Hispanic white children. There are also disparities in dental care service utilization and access to dental care. Approximately 2 in 3 middle and high school students reported at least one dental visit for a checkup, examination, teeth cleaning or any dental work in the past 12 months. A considerable proportion of them, 7% of middle school and 8% of high school students, also reported having visited the emergency room or urgent care centers for problems with their teeth or oral cavity. Non-Hispanic black and Hispanic middle and high school students were more likely to have not visited a dentist but visited the emergency room. Among adults, 28% did not have a dental visit in the past 12 months. One of the reasons for not utilizing dental service is the lack of dental insurance; 42% of adults reported not having dental insurance in 2009. Another reason maybe the lack of dental service providers (1 dentist per 1700 population), particularly in rural areas.

To address unmet needs and disparities in oral health, Georgia offers dental public health services to its population through its 18 public health districts. These services include school-based or school linked sealant and fluoride supplement programs, dental screenings, referrals and treatments.

A successful address of oral health needs necessitates a multifaceted approach at the individual and community levels. At the individual level, lifestyle choices such as good oral hygiene practices, healthy nutrition, tobacco-free environment, and preventive dental care should be promoted. At the community level, adoption and implementation of the five strategies recommended in the 2003 Surgeon General's Report [61] have the potential to improve oral health conditions for all population in the State.

These strategies are:

- Changing public perceptions of oral health;
- Overcoming barriers by replicating effective programs and proven efforts;
- Building the science base and accelerating science transfer;
- Increasing oral health workforce diversity, capacity, and flexibility; and
- Increasing collaborations.

Specifically, some of these strategies can be adopted in the form of policies and programs that promote improved access to dental care for children and adults by:

- Empowering dental hygienists to provide essential oral health services in public health settings without the supervision of a dentist;
- Encouraging relocation of dental professionals to Georgia;
- Generating medical-dental dialogue with an integrated patient-centered approach;
- Supporting community water fluoridation;
- Expanding preventive services for school-age children; and
- Enhancing and expanding surveillance activities to cover special populations such as pregnant women.

Finally, there is also a need to bridge a gap in the availability of oral health data with expanded and enhanced oral health surveillance that will help guide programs. For example, this document lacks data on special populations such as pregnant women and adults in long-term care facilities. Additionally data is lacking on periodontal diseases and school-based health centers with a dental component.

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Annex I. Definition of Technical Terms

Term	Definition
Caries Experience	Includes untreated decay and the presence of amalgam and/or composite fillings, temporary restorations, crowns, and teeth missing because of decay.
Dental Sealants	They are thin plastic coatings that are applied to the grooves on the chewing surfaces of the back teeth (premolars and molars) to protect them from tooth decay by keeping germs and food particles out of the grooves.
Health Disparity	A particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.
Health Equity	The attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities.
Need for Dental Care	Children who are identified with unmet dental treatment needs are referred for care sooner than their next routine checkup. If pain or active oral infection is present, children are referred to a dental provider for immediate or emergency care.
Severe Early Childhood Caries (S-ECC)	In children younger than 3 years of age, any sign of smooth-surface caries is indicative of severe early childhood caries. From ages 3 through 5, 1 or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth; or the involvement of 4 or more tooth surfaces at age 3; 5 or more tooth surfaces at age 4; or 6 or more tooth surfaces at age 5. For the Georgia Head Start Oral Health Survey S-ECC was defined as “at least one of the six maxillary anterior primary teeth is decayed, filled or missing due to caries in a child who is 2-5 years of age.
Tooth Decay (Caries)	Tooth decay is the commonly known term for dental caries, an infectious, transmissible, disease caused by bacteria. The damage done to teeth by this disease is commonly known as cavities. Tooth decay can cause pain and lead to infections in surrounding tissues and tooth loss if not treated properly.
Untreated Decay	Includes any visible tooth decay, broken/chipped teeth with visible decay, and retained roots of decayed teeth.
White Spot Lesions (WSL)	Considers only the six maxillary anterior (upper front) teeth and is defined as white spots found only at the cervical 1/3 of the tooth, with or without a break in the enamel surface, and with or without brown staining. The presence of WSL identifies a child as being “at risk for Early Childhood Caries (ECC)”.
Rampant Caries	Treated (having any dental restoration) or untreated dental caries on 7 or more teeth.
Early Childhood Caries (ECC)	The presence of 1 or more decayed (noncavitated or cavitated lesions), missing teeth (due to caries), or filled tooth surfaces in any primary tooth in a child 71 months (6 years) of age or younger. ECC is sometimes referred to as “Baby Bottle Tooth Decay”, but may be due to causes other than the use of a baby bottle.

Annex II. Oral Cancer Incidence and Mortality Rate by County

Age Adjusted Annual Incidence and Mortality rates* of Oral Cancers by County, Georgia 2002-2006		
County	Annual Incidence Rate (CI)	Annual Death Rate (CI)
US (SEER+NPCR)	10.6 (10.6, 10.7)	2.6 (2.6, 2.6)
Georgia	11.2 (10.9, 11.6)	2.8 (2.7, 3.0)
Baldwin County	11.1 (7.1, 16.4)	-
Barrow County	9.8 (6.4, 14.5)	-
Bartow County	11.6 (8.5, 15.4)	-
Bibb County	11.3 (9.1, 13.9)	4.7 (3.3,.5)
Bulloch County	10.9 (7.1, 16.0)	-
Carroll County	11.5 (8.5, 15.1)	-
Catoosa County	9.6 (6.4, 13.9)	-
Chatham County	12.7 (10.7, 14.8)	2.9 (2.0, 4.0)
Cherokee County	11.7 (9.2, 14.7)	-
Clarke County	9.6 (6.7, 13.3)	-
Clayton County	8.4 (6.5, 10.5)	2.0 (1.1, 3.2)
Cobb County	9.4 (8.3, 10.7)	1.7 (1.2, 2.3)
Coffee County	10.9 (6.6, 17.0)	-
Colquitt County	11.6 (7.5, 17.1)	-
Columbia County	10.4 (7.5, 13.9)	-
Coweta County	8.5 (6.0, 11.8)	-
DeKalb County	10.0 (8.9, 11.2)	2.1 (1.6, 2.8)
Dodge County	19.1 (11.7, 29.7)	-
Dougherty County	14.7 (11.5, 18.6)	3.6 (2.1, 5.8)
Douglas County	9.9 (7.1, 13.4)	-
Effingham County	14.1 (9.0, 20.8)	-
Fayette County	12.3 (9.4, 15.9)	-
Floyd County	10.5 (7.9, 13.7)	3.1 (1.8, 5.1)
Forsyth County	13.1 (10.0, 16.8)	-
Franklin County	13.8 (8.0, 22.3)	-
Fulton County	10.6 (9.6, 11.8)	2.9 (2.4, 3.6)
Gilmer County	14.2 (8.7, 22.0)	-
Glynn County	14.8 (11.3, 19.2)	-
Gordon County	8.8 (5.4, 13.4)	-
Grady County	22.5 (14.9, 32.6)	-
Gwinnett County	10.4 (9.0, 11.8)	2.0 (1.4, 2.8)
Habersham County	12.2 (8.0, 18.0)	-
Hall County	11.3 (8.8, 14.1)	4.0 (2.6, 5.8)
Haralson County	14.4 (9.0, 22.0)	-

*Rate per 100,000 Population

Age Adjusted Annual Incidence and Mortality rates* of Oral Cancers by County, Georgia 2002-2006 (continued)		
County	Annual Incidence Rate (CI)	Annual Death Rate (CI)
Harris County	16.3 (10.4, 24.4)	-
Hart County	12.0 (7.1, 19.3)	-
Henry County	9.2 (7.0, 12.0)	-
Houston County	11.0 (8.4, 14.1)	3.0 (1.7, 4.9)
Jackson County	17.5 (12.6, 23.8)	-
Laurens County	11.7 (7.8, 16.9)	-
Lowndes County	9.8 (7.0, 13.4)	4.4 (2.5, 7.0)
Lumpkin County	20.9 (13.0, 31.7)	-
Madison County	13.1 (7.7, 20.9)	-
Mitchell County	19.8 (12.5, 29.7)	-
Murray County	16.1 (10.5, 23.6)	-
Muscogee County	11.3 (9.2, 13.7)	3.8 (2.6, 5.3)
Newton County	12.8 (9.3, 17.2)	-
Paulding County	13.6 (9.8, 18.3)	-
Peach County	17.6 (10.8, 27.1)	-
Pickens County	14.0 (8.7, 21.5)	-
Polk County	13.3 (8.8, 19.3)	-
Richmond County	11.7 (9.6, 14.0)	2.9 (1.9, 4.2)
Rockdale County	11.2 (7.9, 15.4)	-
Spalding County	11.5 (8.0, 16.0)	-
Stephens County	11.2 (6.5, 18.2)	-
Sumter County	12.9 (7.8, 19.9)	-
Thomas County	11.2 (7.3, 16.4)	-
Tift County	16.7 (11.4, 23.5)	-
Toombs County	17.2 (10.9, 25.9)	-
Troup County	13.9 (10.0, 18.8)	-
Union County	19.0 (12.2, 28.6)	-
Upson County	22.6 (15.7, 31.5)	-
Walker County	11.0 (7.8, 15.2)	-
Walton County	12.3 (8.8, 16.7)	-
Ware County	15.4 (10.3, 22.1)	-
White County	11.6 (6.6, 19.2)	-
Whitfield County	12.3 (9.1, 16.3)	4.1 (2.3,.7)
Other Counties	-	-

*Rate per 100,000 Population

Annex III. Sources of Data and Oral Health Indicator

Data Sources and Oral Health Indicators				
Data Source	**Target population**	**Frequency**	**Most recent**	**Indicators**
Georgia Head start oral health survey	Children < 6 yrs old participating in the Head Start program.	Every five years	2006	Dental caries experience Untreated tooth decay. Dental visit in one year
Georgia 3rd grade student oral health survey	Third grade public school students in Georgia	Every five years	2009	Dental caries experience Untreated tooth decay Need of dental care Dental visits Sealants on molar teeth.
Metropolitan Atlanta Congenital Defects Program (MACDP)	Children < 6 yrs residing in 5 Atlanta Metropolitan Counties – Clayton, Cobb, DeKalb, Fulton, and Gwinnett	Continuous	2006	Orofacial birth defects
Georgia Comprehensive Cancer registry (GCCR)	The general population of Georgia	Continuous	2007	Oral cancer Incidence Oral cancer mortality
Georgia Hospital Association ED visit Records	Patients visiting Emergency Departments in non-federal facilities located in Georgia	Continuous	2008	Non traumatic dental visits
National Survey of Children with Special Healthcare Needs (NS-CSHN)	Children with special needs 1-17 years old	Every 3-5 years	2005/6	Preventive dental care needs Other dental care needs Unmet preventive dental care Unmet other dental care needs
National Survey of Children's Health (NSCH)	Children 1-17 years old	Every 3-5 years	2007	Tooth decay or cavities Toothache Preventive dental care Unmet or delayed dental care
Georgia Youth Risk Behavior Surveillance Survey (YRBSS)	Middle and High school students in Georgia	Every two years	2009	Cavities in permanent teeth Preventive dental visit Toothache or sore mouth Missed school Emergency Room visit
Georgia Behavioral Risk Factors Surveillance System (BRFSS)	Adult residents of Georgia 18 years old and above	Every year, but oral questions every other year	2010	Dental visit Cleaned teeth Never lost a tooth Lost teeth (Adults and 65 years and older)
National Health and Nutrition Examination Survey (NHANES)	General population of the US	Continuous	2009/10	Dental caries experience Untreated tooth decay Dental sealants Never loss Teeth (Adults) Loss Teeth (Adults and 65 years and older)
CDC Water Fluoridation Reporting System (WFRS)	All community water sources across the nation	Continuously updated	2010	Population served

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Office of MCH Epidemiology
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