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Oral Health

Co-Lead Agencies: Centers for Disease Control and Prevention
Health Resources and Services Administration
Indian Health Service
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Goal

Prevent and control oral and craniofacial diseases, conditions, and injuries and improve access to related services.

Overview

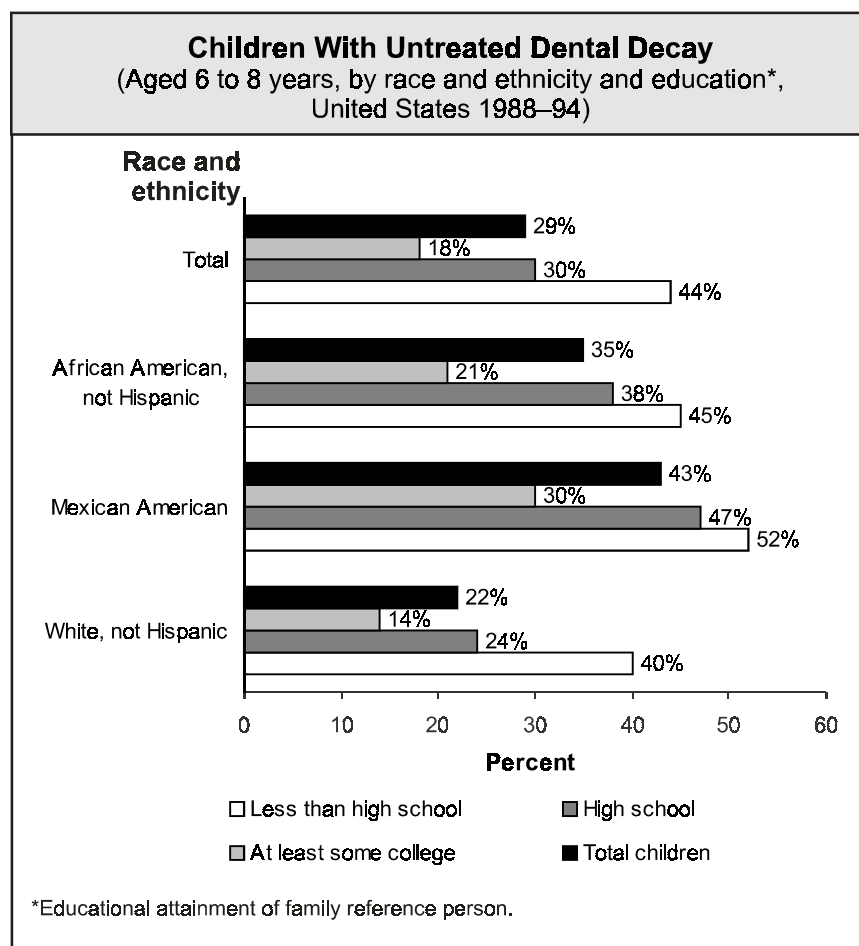
Oral health is an essential and integral component of health throughout life. No one can be truly healthy unless he or she is free from the burden of oral and craniofacial diseases and conditions.¹ Millions of people in the United States experience dental caries, periodontal diseases, and cleft lip and cleft palate, resulting in needless pain and suffering; difficulty in speaking, chewing, and swallowing; increased costs of care; loss of self-esteem; decreased economic productivity through lost work and school days; and, in extreme cases, death.² Further, oral and pharyngeal cancers, which primarily affect adults over age 55 years, result in significant illnesses and disfigurement associated with treatment, substantial cost, and more than 8,000 deaths annually.³

Poor oral health and untreated oral diseases and conditions can have a significant impact on quality of life. Millions of people in the United States are at high risk for oral health problems because of underlying medical or handicapping conditions, ranging from very rare genetic diseases to more common chronic diseases such as arthritis and diabetes.⁴ Oral and facial pain affects a substantial proportion of the general population.^{2,5}

Issues

Dental caries is the single most common chronic disease of childhood, occurring five to eight times as frequently as asthma, the second most common chronic disease in children.¹ Despite the reduction in cases of caries in recent years, more than half of all children have caries by the second grade, and, by the time students finish high school, about 80 percent have caries.⁶ Unless arrested early, caries is irreversible.

Early childhood caries (ECC) affects the primary teeth of infants and young children aged 1 to 6 years.⁷ The exact cause of ECC is unknown, but factors such as large family size, nutritional status of the mother and the infant, and the transfer of infectious organisms from caregiver to infant are under study.^{8,9} Infant feeding practices in which children are put to bed with formula or other sweetened drinks or sweetened pacifiers, especially if a child falls asleep while feeding, have been associated with ECC.¹⁰ Some professional associations recommend that a child should first visit a dentist at age 1 year.¹¹



Source: CDC, NCHS. National Health and Nutrition Examination Survey (NHANES), 1988–94.

Since the early 1970s, the cases of dental caries in permanent teeth have declined dramatically among school-aged children.¹ This decline is the result of various preventive regimens such as community water fluoridation and increased use of toothpastes and rinses that contain fluoride. Dental caries, however, remains a significant problem in some populations, particularly certain racial and ethnic groups and poor children.¹² National data indicate that 80 percent of dental caries in the permanent teeth found in children is concentrated in 25 percent of the child and adolescent population.¹³ Increased use of dental sealants, toothbrushing with fluoridated toothpaste, community water fluoridation, and sound dietary practices are needed to reduce tooth decay.

Data from the third National Health and Nutrition Examination Survey (NHANES III) indicated that 30 percent of all adults had untreated dental decay; 85 percent had ever experienced dental caries. More than 37 percent of dentate persons aged 65 years or older in the United States had at least one decayed or filled root surface.¹⁴ If current trends continue, the baby boomer generation will lose fewer teeth as they age but will have more teeth that are at risk for dental caries throughout life.

Oral and pharyngeal cancers comprise a diversity of malignant tumors that affect the oral cavity and pharynx; virtually all of these tumors are squamous cell carcinomas. Some 31,000 new cases of oral and pharyngeal cancers were expected to be diagnosed in 1999, and approximately 8,100 persons were expected to die from the disease.³ Oral and pharyngeal cancers occur more frequently than leukemia, Hodgkin's disease, and cancers of the brain, cervix, ovary, liver, pancreas, bone, thyroid gland, testes, and stomach. Oral and pharyngeal cancers are the 7th most common cancers found among white males (4th most common among black men) and the 14th most common among U.S. women. The 5-year survival rate for oral and pharyngeal cancers is only 53 percent,¹⁵ and most of these cancers are diagnosed at late stages.¹⁶ Only 13 percent of U.S. adults aged 40 years or older reported having had an oral cancer examination in the past year,¹⁷ which is the recommended interval.¹⁸

Cleft lip and cleft palate are among the more common birth defects in the United States. These congenital defects occur in about 1 per 1,000 live births.^{19, 20} States should have an effective, efficient mechanism in place for identifying, recording, and referring for treatment infants with these conditions. Primary prevention of these craniofacial anomalies involves minimizing exposure to known causes of malformations and, where indicated, providing genetic counseling.

Oral diseases and conditions may have a significant impact on general health; some poor general health conditions also may affect oral health status. Chemotherapy for cancer may cause inflammation and infection of oral mucous tissues. Head and neck radiotherapy and medications taken for many chronic conditions can affect the salivary glands, resulting in decreases in or loss of salivary flow, which, in turn, contribute to the ability to chew and speak and to dental decay.¹ Studies point to associations between periodontal diseases and low birth weight and premature births,^{21, 22, 23} as well as between periodontitis and heart disease and stroke.^{24, 25, 26} The initiation and progression of periodontal infections are affected by systemic factors and habits,²⁷ including tobacco use, uncontrolled diabetes, stress, and genetic factors.

For patients with special risks, invasive dental procedures may result in infective endocarditis;²⁸ infections of artificial knee, hip, and shoulder joints; and complications associated with organ and bone marrow transplantation. Oral complications associated with human immunodeficiency virus (HIV) infection also can have a significant impact on overall health, resulting in loss of appetite, painful mouth sores, weight loss, hospitalization, and potentially life-threatening fungal infections.¹

Many persons in the United States do not receive essential dental services.²⁹ Through increased access to appropriate and timely care, individuals can enjoy improved oral health. Barriers to care include cost; lack of dental insurance, public programs, or providers from underserved racial and ethnic groups; and fear of dental visits. Additionally, some people with limited oral health literacy may not be able to find or understand information and services.

To promote oral health and prevent oral diseases, oral health literacy among all groups is necessary. In addition, oral health services—preventive and restorative—should be available, accessible, and acceptable to all persons in the United States. In areas where different languages, culture, and health care beliefs would otherwise be barriers to care, a cadre of clinically and culturally competent providers must be available to provide care.

Of the 16,926 undergraduate dental students enrolled in U.S. dental schools in 1996–97, fewer than 1,000 were African American, and fewer than 1,000 were Hispanic.³⁰ Native Americans continue to constitute less than 1 percent of the total undergraduate dental enrollment.³⁰ Strategic measures are needed to increase the number of individuals from certain racial and ethnic groups who seek careers in dentistry and public health, now and in the future. With the current health disparities and projected demographic changes in the U.S. population, such measures are needed for all aspects of oral health: education, research, health promotion, and clinical services within the private and public sectors.

One subject of oral health interest, daily brushing with a fluoride-containing toothpaste, is not addressed because data for tracking progress will not be available during the first half of the decade (2000–2005).

Trends

Cases of dental caries in the permanent teeth of school-aged children have been declining in the United States since the early 1970s.¹ The proportion of untreated dental caries in permanent dentition of school-aged children also has been declining overall but has increased in the primary dentition among children aged 6 to 8 years.^{31, 32} Fewer adults are having teeth extracted because of dental decay or periodontal disease, and the percentage of persons who have lost all of their natural teeth has been declining steadily.¹

The percentage of school-aged children with dental sealants has risen in recent years as the public and private sectors increasingly use the procedure, dental insurance pays for dental sealants, and parents request sealants for their children.³² No increase, however, has occurred among children in low-income populations.

Community water fluoridation grew rapidly from its inception in 1945 until about 1980; since then, the proportion of the U.S. population living in communities with fluoridated water supplies has remained at 60 to 62 percent.³³ About 100 million persons still lack the benefits of community water fluoridation.

Over the past 20 years, deaths from oral and pharyngeal cancers have declined by about 25 percent, and new cases have declined by 10 percent, but the 5-year survival rate has remained unchanged. African American men, however, have experienced increases in both death rates and new case rates.¹⁵

Spending for dental services in the United States has risen steadily but has remained fairly constant as a proportion of personal health care spending—about 5 percent in 1997.¹ Dental insurance coverage has not increased. Only 44 percent of persons in the United States have some form of private dental insurance (most with limited coverage and with high copayments), 9 percent have public dental insurance (Medicaid and Children’s Health Insurance Program), 2 percent have other dental insurance, and 45 percent have no dental insurance.³⁴

Disparities

As with general health, oral health status tends to vary in the United States on the basis of sociodemographic factors. For example, the level of untreated dental caries among African American children aged 6 to 8 years (36 percent) and Hispanic children (43 percent) is greater than for white children (26 percent);⁶ as few as 3 percent of poor children have dental sealants compared to the national average (23 percent).⁶ Further, the 5-year survival rate is lower for oral and pharyngeal cancers among African Americans than whites (34 percent versus 56 percent);¹⁶ adults with less than a high school education (5 percent) and those with a high school education (10 percent) were less likely than those with some college (19 percent) to have had an oral cancer examination in the past year;¹⁷ adults with some college (15 percent) have 2 to 2.5 times less destructive periodontal disease than those with high school (28 percent) and with less than high school (35 percent) levels of education.⁶ Among persons aged 65 years and older, 39 percent of persons with less than a high school education were edentulous (had lost all their natural teeth) in 1997, compared with 13 percent of persons with at least some college.³⁵

Promotion of oral health requires self-care and professional care as well as population-based initiatives. Several national surveys show that the proportion of the U.S. population that annually makes at least one dental visit and the average number of visits made vary significantly by age, race, dental status, level of education, and family income.^{6, 35, 36} For example, the Medical Expenditure Panel Survey in 1996³⁶ indicated that about 44 percent of the total population over age 2 visited a dentist in the past year; 50 percent of non-Hispanic whites, 30 percent of Hispanics, and 27 percent of non-Hispanic blacks had a visit while 55 percent of those with some college and only 24 percent of those with less than a high school education had a past-year visit. Approximately twice as many adults with teeth had a dental visit compared to adults without teeth.³⁵

Opportunities

An increased focus on oral health by Federal, State, and professional organizations that occurred at the end of the 1990s should help achieve improvements in oral health and quality of life for individuals and communities. If initiatives, partnerships, and collaborations flourish in this environment of heightened interest, then oral health literacy will increase, access to preventive and restorative services

for persons in need will improve, surveillance of oral diseases or conditions will be enhanced, and appropriate research will explore new ways to improve oral health for everyone in the United States.

Recent legislation in three States requires the widespread implementation of water fluoridation, which should lead to more communities with optimally fluoridated water. By the end of the 20th century, dental caries was limited in many children to pit and fissure tooth surfaces, for which dental sealants are ideal. Opportunities to encourage the dental profession to adopt and implement this preventive technology and for dental insurance companies to pay for sealants must be promoted. Every opportunity must be taken to educate the public about the value of sealants for children shortly after their permanent molars erupt. Opportunities must be expanded to target certain preventive procedures to poor, largely inner-city and rural children in school-based or school-linked programs.

Reducing deaths from oral and pharyngeal cancers and improving the early detection of both types of cancer require immediate attention. Efforts must be made to continue the momentum begun in the 1990s that focused on reducing the number of new cases of oral and pharyngeal cancers and improving survival.^{37,38} Specifically, dental personnel need to provide comprehensive oral cancer examinations on a routine basis for persons aged 40 years and older or who are otherwise at high risk. Dental personnel also need to provide counseling to patients to stop tobacco use and limit alcohol use, both of which are associated with oral and pharyngeal cancers.

The 21st century may provide the opportunity to reduce the burden of birth defects, such as cleft lip and cleft palate. As local and State surveillance systems of developmental anomalies are created or expanded, opportunities should be explored to integrate cleft lip and cleft palate into those systems. If studies confirm the beneficial effects of folic acid in preventing cleft lip and cleft palate, then programs incorporating the use of folic acid should be implemented and monitored.

In general, access to primary preventive and early intervention services must be improved, and barriers to the dental care system should be removed. Many persons of all ages are receiving professional services in the oral health care system, but more emphasis must be placed on vulnerable populations who need professional care.

Interim Progress Toward Year 2000 Objectives

More than half the 17 Healthy People 2000 oral health objectives show progress, and 1 was met. One objective has moved away from the target, and two have shown mixed results. Data since baseline are not available for four of the objectives. The objective of reducing deaths from oral and pharyngeal cancers was met. Dental decay has declined in persons aged 15 years nearly to its target, although less progress has occurred in children aged 6 to 8 years. Similar trends are appar-

ent in those two age groups for untreated dental decay. Elderly persons show improvement in edentulousness, but the number of persons aged 35 to 44 years who had never lost a tooth from caries or periodontal disease fails to show improvement. An increased proportion of children are receiving dental sealants, but further improvement is needed. Little change has occurred in the proportion of the U.S. population served by fluoridated water systems.

Note: Unless otherwise noted, data are from the Centers for Disease Control and Prevention, National Center for Health Statistics, *Healthy People 2000 Review, 1998–99*.

Healthy People 2010—Summary of Objectives

Oral Health

Goal: Prevent and control oral and craniofacial diseases, conditions, and injuries and improve access to related services.

Number	Objective Short Title
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21-1	Dental caries experience
21-2	Untreated dental decay
21-3	No permanent tooth loss
21-4	Complete tooth loss
21-5	Periodontal diseases
21-6	Early detection of oral and pharyngeal cancers
21-7	Annual examinations for oral and pharyngeal cancers
21-8	Dental sealants
21-9	Community water fluoridation
21-10	Use of oral health care system
21-11	Use of oral health care system by residents in long-term care facilities
21-12	Dental services for low-income children
21-13	School-based health centers with oral health component
21-14	Health centers with oral health service components
21-15	Referral for cleft lip or palate
21-16	Oral and craniofacial State-based surveillance system
21-17	Tribal, State, and local dental programs

Healthy People 2010 Objectives

21-1. Reduce the proportion of children and adolescents who have dental caries experience in their primary or permanent teeth.

21-1a. Reduce the proportion of young children with dental caries experience in their primary teeth.

Target: 11 percent.

Baseline: 18 percent of children aged 2 to 4 years had dental caries experience in 1988–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS; California Oral Health Needs Assessment of Children, Dental Health Foundation, 1993–94.

Throughout childhood and adolescence, many opportunities exist for the primary prevention of dental decay. The earliest opportunity to prevent dental decay occurs during prenatal counseling about diet, oral hygiene practices, appropriate uses of fluorides, and the transmission of bacteria from parents to children. Early childhood caries, sometimes referred to as baby bottle tooth decay or nursing caries, can be a devastating condition, often requiring thousands of dollars and a hospital visit with general anesthesia for treatment.^{8,9} The pain, psychological trauma, health risks, and costs associated with restoration of these carious teeth for children affected by ECC can be substantial.¹⁰ Dental care for pregnant females, counseling, reinforcement of health promoting behaviors with caregivers of children, and intervention by dental and other professionals to improve parenting practices (use of fluorides, use of professional services, and diet) provide the best available means of preventing this serious oral disease.

The average number of decayed and filled teeth among 2- to 4-year-olds has remained unchanged over the past 25 years.¹ Children whose parents or caregivers have less than a high school education or whose parents and caregivers are Hispanic, American Indians, or Alaska Natives appear to be at markedly increased risk for developing ECC.⁴

21-1b. Reduce the proportion of children with dental caries experience in their primary and permanent teeth.

Target: 42 percent.

Baseline: 52 percent of children aged 6 to 8 years had dental caries experience in 1988–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS; California Oral Health Needs Assessment of Children, 1993–94, Dental Health Foundation; Hawai'i Children's Oral Health Assessment, 1999, State of Hawaii Department of Health.

Children aged 6 to 8 years are at an important stage of dental development. They still have the majority of their primary teeth, and their permanent first molars and incisors are erupting into their mouths. Maintaining optimal oral health for these children is important for their current functional oral health and for their long-term health. Between the time the first permanent molars erupt into the mouth and before vulnerable pits and fissures are infected, children should be assessed for their need for dental sealants.

21-1c. Reduce the proportion of adolescents with dental caries experience in their permanent teeth.

Target: 51 percent.

Baseline: 61 percent of adolescents aged 15 years had dental caries experience in 1988–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS; California Oral Health Assessment of Children, 1993–94, Dental Health Foundation.

Caries experience is cumulative, thus higher among adolescents than among young children. Effective personal preventive measures—for example, tooth brushing with fluoride toothpastes—need to be applied throughout adolescence, as children become more independent in their oral hygiene and dietary habits. Regular dental visits provide an opportunity to assess oral hygiene and dietary practices and to place sealants on vulnerable permanent teeth that erupt during this life stage (including second permanent molars at around age 12 years).

NOTE: THE TABLE BELOW MAY CONTINUE TO THE FOLLOWING PAGE.

Children and Adolescents, Selected Ages, 1988–94 (unless noted)	Dental Caries Experience		
	21-1a. Aged 2 to 4 Years	21-1b. Aged 6 to 8 Years	21-1c. Aged 15 Years
	Percent		
TOTAL	18	52	61
Race and ethnicity			
American Indian or Alaska Native	76* (1999)	90* (1999)	89* (1999)
Asian or Pacific Islander	DSU	DSU	DSU
Asian	34 [†] (1993–94)	90 [†] (1993–94)	DSU [†] (1993–94)

Children and Adolescents, Selected Ages, 1988–94 (unless noted)	Dental Caries Experience		
	21-1a. Aged 2 to 4 Years	21-1b. Aged 6 to 8 Years	21-1c. Aged 15 Years
	Percent		
Native Hawaiian and other Pacific Islander	DNC	79 [‡] (1999)	DNC
Black or African American	24	50	70
White	15	51	60
Hispanic or Latino			
Hispanic or Latino	DSU	DSU	DSU
Mexican American	27	68	57
Not Hispanic or Latino	17	49	62
Black or African American	24	49	69
White	13	49	61
Gender			
Female	19	54	63
Male	18	50	60
Education level (head of household)			
Less than high school	29	65	59
High school graduate	18	52	63
At least some college	12	43	61
Disability status			
Persons with disabilities	DNC	DNC	DNC
Persons without disabilities	DNC	DNC	DNC
Select populations			
3rd grade students	NA	60	NA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.
NA = Not applicable.

*Data are for IHS service areas.

[†]Data are for California.

[‡]Data are for Hawaii.

NOTE: THE TABLE ABOVE MAY HAVE CONTINUED FROM THE PREVIOUS PAGE.

21-2. Reduce the proportion of children, adolescents, and adults with untreated dental decay.

21-2a. Reduce the proportion of young children with untreated dental decay in their primary teeth.

Target: 9 percent.

Baseline: 16 percent of children aged 2 to 4 years had untreated dental decay in 1988–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS; California Oral Health Needs Assessment of Children, 1993–94, Dental Health Foundation.

Primary teeth should be retained until they come out naturally and are replaced by the permanent teeth. Healthy retained primary teeth enhance self-image; decayed or missing primary teeth may cause a child to be self-conscious and reluctant to smile. Children need to eat nutritious foods to develop normally. The pain and infection of rampant dental disease compromise their ability to eat well. Moreover, early tooth loss caused by dental decay can result in impaired speech development, failure to thrive, absence from and inability to concentrate in school, and reduced self-esteem.

Children aged 2 to 4 years are least likely to have been seen by a dentist, whereas a much larger proportion have been taken to a health provider for medical care or counseling.³⁹ Thus these latter providers should be trained to examine and identify major oral diseases of toddlers and refer those with problems for necessary care.

21-2b. Reduce the proportion of children with untreated dental decay in primary and permanent teeth.

Target: 21 percent.

Baseline: 29 percent of children aged 6 to 8 years had untreated dental decay in 1988–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS; California Oral Health Needs Assessment of Children, 1993–94, Dental Health Foundation; Hawai'i Children's Oral Health Assessment, 1999, State of Hawaii Department of Health.

To avoid pain and discomfort, decayed primary teeth need to be restored, particularly molars in children aged 6 to 8 years. Retention of primary molars until they fall out normally (age 10 to 12 years) allows adequate dental arch space for the eruption of succeeding permanent premolars and avoids the tipping forward of first permanent molars, possibly creating serious orthodontic problems. Carious permanent teeth should be repaired promptly so that fillings may be kept small and as much natural tooth as possible conserved. Often, fillings have to be replaced several times during life; each time, additional tooth structure has to be removed, weakening the tooth. Preventing the initial cavity by appropriate use of fluorides and sealants is preferable to restoring the tooth after disease has occurred.

21-2c. Reduce the proportion of adolescents with untreated dental decay in their permanent teeth.

Target: 15 percent.

Baseline: 20 percent of adolescents aged 15 years had untreated dental decay in 1988–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS; California Oral Health Needs Assessment of Children, 1993–94, Dental Health Foundation.

By age 15 years, all permanent teeth other than third molars have erupted, and vulnerable chewing surfaces of permanent second molars have been exposed to cariogenic factors for 2 or 3 years. Further, by this age, approximately 75 percent of adolescents have experienced dental decay.⁶

21-2d. Reduce the proportion of adults with untreated dental decay.

Target: 15 percent.

Baseline: 27 percent of adults aged 35 to 44 years had untreated dental decay in 1998–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS.

Approximately 30 percent of adults have untreated dental decay.⁶ Untreated dental decay can lead to extensive dental treatment and can be quite costly. If decay is left unheeded, an individual can experience pain, abscess, and extraction of the tooth.

Among adults aged 35 to 44 years, twice as many blacks or African Americans (46 percent) as whites (23 percent) have tooth decay. More than three times as many persons with less than a high school education (51 percent) have untreated dental decay than adults with some college education (16 percent).⁶ Dental decay is just as preventable in adults as it is in children. Access to community water fluoridation benefits adults as well as children. Access to other preventive interventions is critical, as well as access to dental treatment to restore the tooth.

Children, Adolescents, and Adults, Selected Ages, 1988–94 (unless noted)	Untreated Dental Decay			
	21-2a. Aged 2 to 4 Years	21-2b. Aged 6 to 8 Years	21-2c. Aged 15 Years	21-2d. Aged 35 to 44 Years
	Percent			
TOTAL	16	29	20	27
Race and ethnicity				
American Indian or Alaska Native	67* (1999)	69* (1999)	67* (1999)	67* (1999)
Asian or Pacific Islander	DSU	DSU	DSU	DSU
Asian [†]	30 [†] (1993–94)	71 [†] (1993–94)	DSU [†] (1993–94)	DNC
Native Hawaiian and other Pacific Islander	DNC	39 [‡] (1999)	DNC	DNC
Black or African American	22	36	29	46
White	11	26	19	24
Hispanic or Latino				
Hispanic or Latino	DSU	DSU	DSU	DSU
Mexican American	24	43	27	34
Not Hispanic or Latino	14	26	19	DNA
Black or African American	22	35	28	47
White	11	22	18	23
Gender				
Female	16	32	22	25
Male	16	25	17	29
Education level (head of household)				
Less than high school	26	44	29	51
High school graduate	16	30	18	34
At least some college	9	25	15	16
Disability status				
Persons with disabilities	DNC	DNC	DNC	DNA
Persons without disabilities	DNC	DNC	DNC	DNA
Select populations				
3rd grade students	NA	33	NA	NA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

NA = Not applicable.

*Data are for IHS service areas.

[†]Data are for California.

[‡]Data are for Hawaii.

21-3. Increase the proportion of adults who have never had a permanent tooth extracted because of dental caries or periodontal disease.

Target: 42 percent.

Baseline: 31 percent of adults aged 35 to 44 years had never had a permanent tooth extracted because of dental caries or periodontal disease in 1988–94.

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS.

NOTE: THE TABLE BELOW MAY CONTINUE TO THE FOLLOWING PAGE.

Persons Aged 35 to 44 Years, 1988–94	No Tooth Extractions
	Percent
TOTAL	31
Race and ethnicity	
American Indian or Alaska Native	23* (1999)
Asian or Pacific Islander	DSU
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	12
White	34
Hispanic or Latino	
Hispanic or Latino	DSU
Mexican American	36
Not Hispanic or Latino	DNA
Black or African American	12
White	36
Gender	
Female	32
Male	30
Education level	
Less than high school	15
High school graduate	21
At least some college	41

Persons Aged 35 to 44 Years, 1988–94	No Tooth Extractions
	Percent
Disability status	
Persons with disabilities	DNA
Persons without disabilities	DNA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

*Data are for IHS service areas.

NOTE: THE TABLE ABOVE MAY HAVE CONTINUED FROM THE PREVIOUS PAGE.

A full dentition is defined as having 28 natural teeth, exclusive of third molars and teeth removed for orthodontic treatment or as a result of trauma. Most persons can keep their teeth for life with optimal personal, professional, and population-based preventive practices. Early tooth loss has been shown to be a predictor of eventual edentulism.⁴⁰ As teeth are lost, a person’s ability to chew and speak decreases. A loss of or a withdrawal from social functioning can occur. Tooth loss can 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,¹ older data indicate 25 percent of American Indians or Alaska Natives aged 35 to 44 years have fewer than 20 natural teeth;⁴ among all persons aged 55 years and older, nearly 75 percent have fewer than 20 natural teeth. Females tend to have more teeth extracted than males of the same age group. African Americans are more likely than whites to have teeth extracted.⁶ The percentage of whites who have never had a permanent tooth extracted is more than three times as great as for African Americans. Among all predisposing and enabling variables, low educational level often has been found to have the strongest and most consistent association with tooth loss.⁴¹

21-4. Reduce the proportion of older adults who have had all their natural teeth extracted.

Target: 20 percent.

Baseline: 26 percent of adults aged 65 to 74 years had lost all their natural teeth in 1997.

Target setting method: Better than the best.

Data sources: National Health Interview Survey (NHIS), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS.

Adults Aged 65 to 74 Years, 1997 (unless noted)	Lost All Natural Teeth
	Percent
TOTAL	26
Race and ethnicity	
American Indian or Alaska Native	30* (1999)
Asian or Pacific Islander	DSU
Asian	DSU
Native Hawaiian and other Pacific Islander	DSU
Black or African American	30
White	25
Hispanic or Latino	
Hispanic or Latino	24
Not Hispanic or Latino	26
Black or African American	30
White	26
Gender	
Female	27
Male	24
Education level	
Less than high school	39
High school graduate	26
At least some college	13
Disability status	
Persons with disabilities	34
Persons without disabilities	22

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

*Data are for IHS service areas.

Despite a steady decline in the rate of complete tooth loss over the past several decades, 26 percent of persons aged 65 to 74 years had lost all of their natural teeth. The rate of complete tooth loss among African Americans is 30 percent whereas that for Hispanics is 24 percent. Among all persons aged 65 years and older, 30 percent had lost all of their natural teeth.³⁵ Low-income adults aged 65 years and older experience a higher rate of edentulism (48 percent in 1993).³² Also, State-specific variations range from 13 to 47 percent in the self-reported prevalence of complete tooth loss.⁴²

Among elderly persons, loss of all natural teeth can contribute to psychological, social, and physical impairment.² Even when missing teeth are replaced with well-constructed dentures, there may be limitations in speech, chewing ability, taste

perception, and quality of life. Most tooth loss is the result of dental caries and periodontal disease. The level of edentulism reflects not only the cases of caries and periodontal disease but also the availability and use of appropriate professional services and community preventive services. Tooth loss can be prevented through education, early diagnosis, and regular dental care. Children and adults (and the health care professionals who serve them) must recognize the signs and symptoms of oral and systemic diseases and know the oral and general health care practices necessary to prevent them.

21-5. Reduce periodontal disease.

Target and baseline:

Objective	Reduction in Periodontal Disease in Adults Aged 35 to 44 Years	1988–94 Baseline	2010 Target
		<i>Percent</i>	
21-5a.	Gingivitis	48	41
21-5b.	Destructive periodontal disease	22	14

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS.

NOTE: THE TABLE BELOW MAY CONTINUE TO THE FOLLOWING PAGE.

Adults Aged 35 to 44 Years, 1988–94 (unless noted)	21-5a. Gingivitis	21-5b. Destructive Periodontal Disease
	Percent	
TOTAL	48	22
Race and ethnicity		
American Indian or Alaska Native	98* (1999)	54* (1999)
Asian or Pacific Islander	DSU	DSU
Asian	DNC	DNC
Native Hawaiian and other Pacific Islander	DNC	DNC
Black or African American	51	33
White	47	20

Adults Aged 35 to 44 Years, 1988–94 (unless noted)	21-5a. Gingivitis	21-5b. Destructive Periodontal Disease
	Percent	
Hispanic or Latino	DSU	DSU
Mexican American	64	24
Not Hispanic or Latino	DNA	DNA
Black or African American	51	33
White	45	20
Gender		
Female	45	15
Male	52	29
Education level		
Less than high school	60	35
High school graduate	52	28
At least some college	42	15
Disability status		
Persons with disabilities	DNA	DNA
Persons without disabilities	DNA	DNA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.
*Data are for IHS service areas.

NOTE: THE TABLE ABOVE MAY HAVE CONTINUED FROM THE PREVIOUS PAGE.

Gingivitis is characterized by localized inflammation, swelling, and bleeding gum tissues without a loss of connective tissue or bone support. Gingivitis usually is reversible with proper daily oral hygiene and serves as a crude measure of a person's self-care practices.⁴³ Removal of dental plaque from the teeth on a daily basis is extremely important to prevent gingivitis, which can progress to destructive periodontal disease. Most plaque removal can be achieved by conscientious tooth brushing. The use of dental floss helps to remove dental plaque from tooth surfaces that touch one another.

Most young adults have some gingivitis. Cases of gingivitis are high among Hispanics, American Indians, Alaska Natives, and adults with low incomes.⁴ Cases of gingivitis likely will remain a substantial problem and may increase as tooth loss from dental caries declines or as a result of the use of some systemic medications. Although not all cases of gingivitis progress to periodontal disease, all periodontal disease starts as gingivitis.⁴⁴ The major method available to prevent destructive periodontitis, therefore, is to prevent the precursor condition of gingivitis.

Periodontal disease is manifested by the loss of the connective tissue and bone that support the teeth.⁴⁵ It places a person at risk of eventual tooth loss unless appropriate treatment occurs.⁴⁵ The presence of one or more sites with 4 mm or

appropriate treatment occurs.⁴⁵ The presence of one or more sites with 4 mm or greater loss of tooth attachment to surrounding periodontal tissues has been used to measure the cases of destructive periodontal disease.⁴⁵ This measure has allowed the monitoring of changes in periodontal disease over time and distinguishes the status of select populations from one another. Other measurements under development may serve as indicators of periodontal disease in the future. Among adults, destructive periodontal disease may be associated with an increased risk of some systemic disease and is a leading cause of bleeding, pain, infection, tooth mobility, and tooth loss.^{21, 22, 23, 24, 25, 26}

Tobacco use, especially cigarette smoking, is a significant risk factor for periodontal disease,²⁷ accounting for up to half of all cases of periodontitis.⁴⁶ Home-care oral hygiene practices, such as daily tooth brushing and flossing, reduce bacterial plaque on teeth and gingiva and help maintain periodontal health. The number of cases of periodontal disease in persons with poor oral hygiene is more than 20 times that for persons who have good oral care practices.²⁷ Recent research has suggested that bacteria associated with periodontal disease are associated with an increased risk of heart disease and stroke, premature births in some females, and respiratory infection in susceptible individuals.^{21, 22, 23, 24, 26}

The cases and severity of destructive periodontal disease are measured by loss of tissue attachment to the tooth and gingival pocket depth. These measures increase with age and vary by socioeconomic status. The number of cases of periodontal disease is higher than the national average among American Indians and Alaska Natives, adults with less than a high school education, and migrant workers.⁴ Unless preventive measures are taken, the problem of destructive periodontal disease will grow as the aging U.S. population retains more teeth later in life. More effective intervention across the entire adult age spectrum will be essential.

21-6. Increase the proportion of oral and pharyngeal cancers detected at the earliest stage.

Target: 50 percent.

Baseline: 35 percent of oral and pharyngeal cancers (stage I, localized) were detected in 1990–95.

Target setting method: Better than the best.

Data source: Surveillance, Epidemiology, and End Results (SEER), NIH, NCI.

Persons With Oral and Pharyngeal Cancers, 1990–95	Detected at Earliest Stage
	Percent
TOTAL	35
Race and ethnicity	
American Indian or Alaska Native	20
Asian or Pacific Islander	DNA
Asian	DNA
Native Hawaiian and other Pacific Islander	DNA
Black or African American	21
White	38
Hispanic or Latino	
Hispanic or Latino	36
Not Hispanic or Latino	34
Black or African American	DNA
White	DNA
Gender	
Female	39
Male	34
Education level	
Less than high school	DNA
High school graduate	DNA
At least some college	DNA
Disability status	
Persons with disabilities	DNA
Persons without disabilities	DNA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

For many years, the proportion of oral and pharyngeal cancer lesions diagnosed at stage I has remained low at about 35 percent.¹⁶ Increasing the proportion of lesions detected at the earliest stage of diagnosis improves the 5-year survival rate and is one strategy to reduce illness and deaths.

For example, the 5-year survival rate for early stage cancer is 81 percent but is only 22 percent among persons diagnosed with advanced stage cancer. Further, only 19 percent of African Americans with oral and pharyngeal cancers are diagnosed at the local stage (with 34 percent 5-year survival), compared to 38 percent of whites (with 56 percent 5-year survival).¹⁶

A higher proportion of oral and pharyngeal cancer lesions diagnosed at stage I and a lower number of deaths from oral and pharyngeal cancers would indicate that

strategies to increase appropriate detection with comprehensive oral and pharyngeal cancer examinations and referral have been successful. Other outcome measures indicating success include a reduction in new cases of oral and pharyngeal cancers, reduced death rates, and an increase in 5-year survival rates.

21-7. Increase the proportion of adults who, in the past 12 months, report having had an examination to detect oral and pharyngeal cancers.

Target: 20 percent.

Baseline: 13 percent of adults aged 40 years and older reported having had an oral and pharyngeal cancer examination in 1998 (age adjusted to the year 2000 standard population).

Target setting method: Better than the best.

Data source: National Health Interview Survey (NHIS), CDC, NCHS.

NOTE: THE TABLE BELOW MAY CONTINUE TO THE FOLLOWING PAGE.

Adults Aged 40 Years and Older, 1998	Oral and Pharyngeal Cancer Examination in Past 12 Months
	Percent
TOTAL	13
Race and ethnicity	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	12
Asian	12
Native Hawaiian and other Pacific Islander	DSU
Black or African American	7
White	14
Hispanic or Latino	6
Not Hispanic or Latino	14
Black or African American	7
White	15
Gender	
Female	14
Male	13

Adults Aged 40 Years and Older, 1998	Oral and Pharyngeal Cancer Examination in Past 12 Months
	Percent
Education level	
Less than high school	5
High school graduate	10
At least some college	19

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Note: Data age adjusted to the year 2000 standard population.

NOTE: THE TABLE ABOVE MAY HAVE CONTINUED FROM THE PREVIOUS PAGE.

Oral cancer detection is accomplished by a thorough extra-oral examination of the head and neck and an intra-oral examination including the tongue and the entire oral and pharyngeal mucosal tissues, lips, and intra- and extra-oral palpation of the lymph nodes. Although the sensitivity and specificity of the oral cancer examination have not been established in clinical studies, evidence clearly supports a better prognosis with early detection and treatment of oral cancer.³⁷ If suspicious tissues are detected during examination, definitive diagnostic tests are needed, such as biopsies, to make a firm diagnosis.

The occurrence of oral and pharyngeal cancers varies by race and ethnicity. For example, blacks and whites have 12.5 and 10.0 new cases per 100,000 per year, respectively; Hispanics and American Indians and Alaska Natives have only 6.5 and 8.8 new cases per year, respectively.³

Regular oral cancer examinations afford an opportunity for practitioners to discuss with patients primary prevention of these lesions—that is, avoiding known risk factors, such as the 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 90 percent of all oral cancers.⁴⁷ Individuals also should be advised to avoid other potential carcinogens, such as exposure to sunlight (risk factor for lip cancer) without protection (use of lip sunscreen and hats recommended). (See Focus Area 3. Cancer.)

Because more adults seek care from physicians than from dentists, medical personnel must be educated on the importance of routinely doing oral cancer detection examinations of patients at high risk, and they also must be trained in the proper procedures for these examinations.⁴⁸

21-8. Increase the proportion of children who have received dental sealants on their molar teeth.

Target and baseline:

Objective	Increase in Children Receiving Dental Sealants on Their Molar Teeth	1988–94 Baseline	2010 Target
		<i>Percent</i>	
21-8a.	Children aged 8 years	23	50
21-8b.	Adolescents aged 14 years	15	50

Target setting method: Better than the best.

Data sources: National Health and Nutrition Examination Survey (NHANES), CDC, NCHS; Oral Health Survey of Native Americans, 1999, IHS; Hawai'i Children's Oral Health Assessment, 1999, State of Hawaii Department of Health.

NOTE: THE TABLE BELOW MAY CONTINUE TO THE FOLLOWING PAGE.

Children, Selected Ages, 1988–94 (unless noted)	Dental Sealants on Molars	
	21-8a. Aged 8 Years	21-8b. Aged 14 Years
	Percent	
TOTAL	23	15
Race and ethnicity		
American Indian or Alaska Native	55* (1999)	42* (1999)
Asian or Pacific Islander	DSU	DSU
Asian	DNC	DNC
Native Hawaiian and other Pacific Islander	20 [†] (1999)	DNC
Black or African American	11	5
White	26	19
Hispanic or Latino		
Hispanic or Latino	DSU	DSU
Mexican American	10	7
Not Hispanic or Latino	25	DNA
Black or African American	11	5
White	29	18
Gender		
Female	24	14
Male	22	16

Children, Selected Ages, 1988–94 (unless noted)	Dental Sealants on Molars	
	21-8a. Aged 8 Years	21-8b. Aged 14 Years
	Percent	
Education level (head of household)		
Less than high school	17	4
High school graduate	12	6
At least some college	35	28
Disability status		
Persons with disabilities	DNC	DNC
Persons without disabilities	DNC	DNC
Select populations		
3rd grade students	26	NA

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable. NA = Not applicable.

*Data are for IHS service areas.

†Data are for Hawaii.

NOTE: THE TABLE ABOVE MAY HAVE CONTINUED FROM THE PREVIOUS PAGE.

Since the early 1970s, childhood dental caries in smooth tooth surfaces (those without pits and fissures) has declined markedly because of widespread exposure to fluorides. By 1986–87, approximately 90 percent of the decay in children’s teeth occurred in tooth surfaces with pits and fissures, and almost two-thirds were found in the chewing surfaces alone.³¹

Pit-and-fissure sealants—plastic coatings applied to 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 caries in areas of the teeth where food and bacteria are 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.⁴⁹

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

21-9. Increase the proportion of the U.S. population served by community water systems with optimally fluoridated water.

Target: 75 percent.

Baseline: 62 percent of the U.S. population was served by community water systems with optimally fluoridated water in 1992.

Target setting method: 21 percent improvement.

Data source: CDC Fluoridation Census, CDC, NCCDPHP.

Data for population groups currently are not collected.

Community water fluoridation is the procedure of adjusting the natural fluoride concentration of a community's water supply to a level that is best for the prevention of dental decay. In the United States, community water fluoridation has been the basis for the primary prevention of dental decay for nearly 55 years and has been recognized as 1 of 10 great achievements in public health of the 20th century.⁵⁰ It is an ideal public health method because it is effective, eminently safe, inexpensive, requires no cooperative effort or direct action, and does not depend on access or availability of professional services. It is equitable because the entire population benefits regardless of financial resources.³³

Water fluoridation reduces or eliminates disparities in preventing dental caries among different socioeconomic, racial, and ethnic groups. Fluoridation helps to lower the cost of dental care and dental insurance and helps residents retain their teeth throughout life. Of the Nation's 50 largest cities, only 7 do not benefit from community water fluoridation.³³ The consumption of fluoridated water provides both systemic fluoride exposure to developing teeth and frequent topical exposure to erupted teeth, promoting remineralization of early caries among persons of all ages.

Operators of municipal water plants need to maintain targeted concentrations of fluoride in water in fluoridated communities. Ongoing education for water plant personnel must continue with appropriate surveillance by State and local health officials.

21-10. Increase the proportion of children and adults who use the oral health care system each year.

Target: 56 percent.

Baseline: 44 percent of persons aged 2 years and older in 1996 visited a dentist during the previous year.

Target setting method: Better than the best.

Data source: Medical Expenditure Panel Survey (MEPS), AHRQ.

NOTE: THE TABLE BELOW MAY CONTINUE TO THE FOLLOWING PAGE.

Persons Aged 2 Years and Older, 1996	Dental Visit in Previous Year
	Percent
TOTAL	44
Race and ethnicity	
American Indian or Alaska Native	34
Asian or Pacific Islander	42
Asian	DSU
Native Hawaiian and other Pacific Islander	DSU
Black or African American	27
White	47
Hispanic or Latino	30
Not Hispanic or Latino	DNC
Black or African American	27
White	50
Gender	
Female	47
Male	41
Education level (aged 25 years and older)	
Less than high school	24
High school graduate	40
At least some college	55
Disability status	
Persons with disabilities	40
Persons without disabilities	45
Select populations	
Children aged 2 to 17 years	48
Children at first school experience (aged 5 years)	48
3rd grade students	DNC
Children, adolescents, and young adults aged 2 to 19 years; <200 percent of poverty level	20
Adults aged 18 years and older	43
Adults aged 65 years and older	41

Persons Aged 2 Years and Older, 1996	Dental Visit in Previous Year
	Percent
Dentate adults aged 18 years and older	DNC
Edentate adults aged 18 years and older	DNC
Adults aged 18 years and older with disabilities	DNC

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

NOTE: THE TABLE ABOVE MAY HAVE CONTINUED FROM THE PREVIOUS PAGE.

Although appropriate home oral health care and population-based prevention are essential, professional care also is necessary to maintain optimal oral and craniofacial health. Oral health care is an important, but often neglected, component of total health care. Regular dental visits provide an opportunity for the early diagnosis, prevention, and treatment of oral and craniofacial diseases and conditions for persons of all ages, as well as for the assessment of self-care practices. Experts recommend that children as young as age 1 year be examined for evidence of developing ECC.¹¹ Further, parents should be advised to avoid feeding practices that may lead to ECC, and parents should be counseled about the appropriate use of fluoride and other preventive measures. Necessary tooth restorative care must be provided to avoid pain, abscesses, and the need for tooth extractions. Sealants should be placed shortly after the permanent molars erupt.

Adults who do not receive regular professional care can develop oral diseases that eventually require complex restorative treatment and may lead to tooth loss, systemic health problems, and even death in rare cases. As gums recede in adults, the root surfaces of teeth become susceptible to dental caries. As the U.S. population ages, root caries may become a significant dental problem for adults and, particularly, for seniors; one in every five persons will be aged 65 years or older by the year 2010. Adults susceptible to root caries should visit their dentists regularly for evaluation and treatment, if necessary.

Persons who have lost all their natural teeth are less likely to seek periodic dental care than those with teeth,⁶ which, in turn, decreases the likelihood of early detection of oral cancer in those without teeth. Edentulism occurs most frequently among older adults who also have the greatest risk of developing oral cancer.

Persons with no natural teeth who lack regular dental care may develop soft tissue lesions from medications, systemic conditions, and exposure to tobacco, as well as from prosthetic appliances that are not fully functional or are not maintained properly. As they grow older, persons with and without teeth are at increased risk of oral and pharyngeal cancers, as well as autoimmune disorders and other chronic disabling conditions that have oral manifestations. People without teeth may be unaware that they are still at risk for oral diseases. Consequently, they may have long intervals between professional examinations. Coordination of care between physicians and dentists is essential for optimal general health and oral health.

21-11. Increase the proportion of long-term care residents who use the oral health care system each year.

Target: 25 percent.

Baseline: 19 percent of all nursing home residents received dental services in 1997.

Target setting method: 32 percent improvement. (Better than the best will be used when data are available.)

Data source: National Nursing Home Survey, CDC, NCHS.

Data for population groups currently are not analyzed.

To improve the oral health of the Nation's elderly persons and persons with disabilities who reside in long-term care facilities, every resident needs to have access to oral health assessment and treatment. Federal regulations require nursing facilities certified under Medicare or Medicaid or both to ensure that each resident attains and maintains the highest practicable physical, psychosocial, and mental well-being.

For many nursing home residents, substantial anecdotal evidence suggests that neither dental assessments nor subsequent treatments are being provided effectively. Nursing home staff members and State surveyors who assess long-term care facilities for certification should receive appropriate training to enable them to recognize residents' needs correctly and to ensure that necessary oral health services are available.

Residents of institutions face several barriers to obtaining needed dental services. Often, residents have multiple chronic diseases, take medications that affect their oral health, or have diseases or disabilities that make brushing and flossing their teeth difficult or impossible.⁵¹ A decline in physical and oral health, use of one or more of the many medications that cause dry mouth (xerostomia), and inadequate access to dental care increase the risks of oral diseases such as yeast infections (candidiasis), caries on the crowns and roots of teeth, gingivitis, oral mucosal lesions, and periodontal disease.

21-12. Increase the proportion of low-income children and adolescents who received any preventive dental service during the past year.

Target: 57 percent.

Baseline: 20 percent of children and adolescents under age 19 years at or below 200 percent of the Federal poverty level received any preventive dental service in 1996.

Target setting method: Better than the best.

Data source: Medical Expenditure Panel Survey (MEPS), AHRQ.

Children Under Age 19 Years at or Below 200 Percent of the Federal Poverty Level, 1996	Preventive Dental Visit in Past 12 Months
	Percent
TOTAL	20
Race and ethnicity	
American Indian or Alaska Native	DSU
Asian or Pacific Islander	DSU
Asian	DNC
Native Hawaiian and other Pacific Islander	DNC
Black or African American	13
White	25
Hispanic or Latino	16
Not Hispanic or Latino	DNA
Black or African American	DNA
White	DNA
Gender	
Female	21
Male	19

DNA = Data have not been analyzed. DNC = Data are not collected. DSU = Data are statistically unreliable.

Public policymakers have long recognized the need for programs to facilitate access to dental services for children from low-income households. Coverage for pediatric dental services has been required under Medicaid for more than two decades and is allowed, although not required, under the new State Children’s Health Insurance Program, also known as SCHIP.⁵²

Despite the potential for improved oral health status, only about 20 percent of Medicaid children were reported to have received any preventive dental services in 1993.³⁹ Current research also indicates that children from low-income households have higher caries rates and more unmet dental treatment needs than their higher income counterparts.¹²

21-13. (Developmental) Increase the proportion of school-based health centers with an oral health component.

Potential data source: School Health Policies and Programs Study (SHPPS), CDC, NCCDPHP.

In some rural areas and urban neighborhoods, where health and social problems are concentrated and few residents have health insurance or the personal means to pay for private health care, most children do not receive timely preventive proce-

dures.³⁹ The burden of untreated caries falls heaviest on children from low-income families.^{12, 29} Moreover, disparities in oral health status and the use of dental services persist among certain ethnic and racial groups.⁶

Increasingly, schools are being viewed as an effective way to improve access to health and social support services for vulnerable populations. Parents give permission for health center staff members to oversee the provision of health education and preventive and treatment services. School-affiliated strategies mobilize existing community resources to create referral networks for students and provide services in the school when appropriate, based on community needs, resources, standards, and requirements.⁵³ Few school-based health centers include an oral health component. School-based oral health services could enable the targeting of preventive services such as fluoride mouth rinses or tablets and dental sealants to underserved, low-income children. Services also could include screening, referral, and case management to ensure the timely receipt of treatment services from community practitioners. School-based health centers should have oral health services and educational materials that are culturally and linguistically appropriate.

Multiple models for school-based health centers are in place. They typically are funded from a mix of sources, both public and private. School-based health centers have been increasing in numbers nationwide. The number of school-based health centers nationally was estimated to be 1,157 in 1997–98; the proportion with a dental component, however, is thought to be low.⁵⁴

21-14. Increase the proportion of local health departments and community-based health centers, including community, migrant, and homeless health centers, that have an oral health component.

Target: 75 percent.

Baseline: 34 percent of local jurisdictions and health centers had oral health components in 1997.

Target setting method: 19 percent improvement.

Data source: HRSA, Bureau of Primary Health Care (BPHC).

Although dentists donate more services than do physicians to individuals who cannot afford care,⁵⁵ persons who cannot afford routine dental care and who are not covered either by public programs or by private dental insurance often do not receive basic dental services. Access to care for children and adults continues to be a problem for many, particularly for economically disadvantaged populations.²⁹

To eliminate disparities in the provision of health care, more opportunities for preventive and restorative dental services must be provided in areas where need is demonstrated. Some local health departments promote community-based preventive services and provide dental services to children and to some adults; most local health departments lack a dental component.⁵⁶ Other sources of health care are

community, migrant, or homeless health centers, which are located in approximately 700 areas where a need has been documented. By the late 1990s, nearly 60 percent of community-based health centers had a dental component.⁵⁷ These centers, which strive to ensure that health education programs and oral health staff members are culturally competent and linguistically appropriate, extend dental care to groups that traditionally have limited access to dental services.

The need is great among many populations in the United States. These centers serve primarily certain racial and ethnic populations, who are more likely than whites to live or work in medically and dentally underserved areas. Rural and low-income urban select population communities are more likely to have a shortage of health care providers. More health care providers from certain racial and ethnic groups are needed because they are more likely than white health care providers to treat Medicaid or uninsured patients.^{52, 58, 59, 60, 61}

21-15. Increase the number of States and the District of Columbia that have a system for recording and referring infants and children with cleft lips, cleft palates, and other craniofacial anomalies to craniofacial anomaly rehabilitative teams.

Target: All States and the District of Columbia.

Baseline: 23 States and the District of Columbia had systems for recording and referring children with craniofacial anomalies in 1997.

Target setting method: Total coverage.

Data source: Survey of State Dental Directors, Illinois State Health Department.

States should have an effective mechanism in place for identifying, recording, and referring for treatment infants with cleft lips or cleft palates or both. Cleft lip and cleft palate are reported in about 1 of 1,000 live births, and isolated cleft palate is reported in about 0.5 of 1,000 live births, making these three conditions among the most common birth defects.^{19, 20}

Physicians and nurses in hospital nurseries are usually the first to examine newborns and are responsible for noting any congenital anomalies and describing them on the neonatal medical records. Therefore, hospital personnel must understand the definitions of congenital defects and abnormalities of the lips and palate, properly examine newborns, and correctly record any malformations.

Proper diagnosis is important because newborns with cleft lip or cleft palate should be referred immediately to an interdisciplinary core craniofacial team to assess these infants and to counsel the parents prior to discharge. Sending infants home without comprehensive instructions for their parents or caregivers can seriously compromise the health of the infants. Therefore, children need to be enrolled in a system that provides for continuity of care.⁶² Surgical repair of the lips often is performed soon after birth, repair of the palate usually should be per-

formed before age 18 months.⁶³ Appropriate intervention will minimize the extent to which physical and psychosocial trauma adversely affect child development.

21-16. Increase the number of States and the District of Columbia that have an oral and craniofacial health surveillance system.

Target: All States and the District of Columbia.

Baseline: No States or the District of Columbia had oral and craniofacial health surveillance systems in 1999.

Target setting method: Total coverage.

Data source: Association of State and Territorial Dental Directors.

State and local dental programs have been hampered severely in carrying out their programmatic activities to improve health because of a lack of State-specific oral health data.⁵⁶ The existence of surveillance systems within States to assess oral health needs is essential for determining trends in oral diseases, implementing and evaluating interventions, and identifying where resources are required to improve oral health status. Surveillance systems are not just data collection systems, but involve at least (1) a timely communication of findings to responsible parties and to the public and (2) the use of data to initiate and evaluate public health measures to prevent and control diseases and conditions.⁶⁴ An oral health surveillance system for a State should contain, at a minimum, a core set of measures that describe the status of important oral health conditions to serve as benchmarks for assessing progress in achieving good oral health.

21-17. (Developmental) Increase the number of Tribal, State (including the District of Columbia), and local health agencies that serve jurisdictions of 250,000 or more persons that have in place an effective public dental health program directed by a dental professional with public health training.

Potential data sources: Association of State and Territorial Dental Directors; IHS.

The ability to improve the health and quality of life for communities and individuals relies on population-based preventive programs and the public and private capacity to provide needed care. The capability to provide services depends on an adequate infrastructure at the Tribal, State, and local health department level. This infrastructure is seriously compromised; for example, in 1999 only 29 States had full-time State dental directors, 14 States had part-time directors, and 8 States had no director. Dental professionals in leadership positions who have public health training are needed in Tribal, State, and local health departments to implement necessary oral health programs. A survey found that two-thirds of 243 local health

departments serving nearly 80 million persons in the United States in 1995 reported having a dental program, of which 62 percent were directed by dentists and 22 percent by dental hygienists; the other 16 percent were directed by nondental personnel. The level of public health training of these persons was not assessed.⁵⁶

Related Objectives From Other Focus Areas

- 1. Access to Quality Health Services**
 - 1-1. Persons with health insurance
 - 1-2. Health insurance coverage for clinical preventive services
 - 1-3. Counseling about health behaviors
 - 1-4. Source of ongoing care
 - 1-7. Core competencies in health provider training
 - 1-8. Racial and ethnic representation in health professions
 - 1-15. Long-term care services
- 2. Arthritis, Osteoporosis, and Chronic Back Conditions**
 - 2-2. Activity limitations due to arthritis
 - 2-3. Personal care limitations
 - 2-7. Seeing a health care provider
 - 2-8. Arthritis education
- 3. Cancer**
 - 3-1. Overall cancer deaths
 - 3-6. Oropharyngeal cancer deaths
 - 3-9. Sun exposure and skin cancer
 - 3-10. Provider counseling about cancer prevention
 - 3-14. Statewide cancer registries
 - 3-15. Cancer survival
- 5. Diabetes**
 - 5-1. Diabetes education
 - 5-2. New cases of diabetes
 - 5-3. Overall cases of diagnosed diabetes
 - 5-4. Diagnosis of diabetes
 - 5-15. Annual dental examinations
- 6. Disability and Secondary Conditions**
 - 6-13. Surveillance and health promotion programs
- 7. Educational and Community-Based Programs**
 - 7-1. High school completion
 - 7-2. School health education
 - 7-3. Health-risk behavior information for college and university students
 - 7-4. School nurse-to-student ratio
 - 7-5. Worksite health promotion programs
 - 7-6. Participation in employer-sponsored health promotion activities
 - 7-7. Patient and family education
 - 7-10. Community health promotion programs
 - 7-11. Culturally appropriate and linguistically competent community health promotion programs
 - 7-12. Older adult participation in community health promotion activities

- 8. Environmental Health**
 - 8-5. Safe drinking water
- 11. Health Communication**
 - 11-1. Households with Internet access
 - 11-2. Health literacy
 - 11-3. Research and evaluation of communication programs
 - 11-4. Quality of Internet health information sources
 - 11-6. Satisfaction with health care providers' communication skills
- 12. Heart Disease and Stroke**
 - 12-1. Coronary heart disease (CHD) deaths
- 14. Immunization and Infectious Diseases**
 - 14-3. Hepatitis B in adults and high-risk groups
 - 14-9. Hepatitis C
 - 14-10. Identification of persons with chronic hepatitis C
 - 14-28. Hepatitis B vaccination among high-risk groups
- 15. Injury and Violence Prevention**
 - 15-1. Nonfatal head injuries
 - 15-17. Nonfatal motor vehicle injuries
 - 15-19. Safety belts
 - 15-20. Child restraints
 - 15-21. Motorcycle helmet use
 - 15-23. Bicycle helmet use
 - 15-24. Bicycle helmet laws
 - 15-31. Injury protection in school sports
- 16. Maternal, Infant, and Child Health**
 - 16-6. Prenatal care
 - 16-8. Very low birth weight infants born at level III hospitals
 - 16-10. Low birth weight and very low birth weight
 - 16-11. Preterm births
 - 16-16. Optimum folic acid levels
 - 16-19. Breastfeeding
 - 16-23. Service systems for children with special health care needs
- 17. Medical Product Safety**
 - 17-3. Provider review of medications taken by patients
 - 17-4. Receipt of useful information about prescriptions from pharmacies
 - 17-5. Receipt of oral counseling about medications from prescribers and dispensers
- 18. Mental Health and Mental Disorders**
 - 18-5. Eating disorder relapses
- 19. Nutrition and Overweight**
 - 19-1. Healthy weight in adults
 - 19-2. Obesity in adults
 - 19-3. Overweight or obesity in children and adolescents
 - 19-5. Fruit intake
 - 19-6. Vegetable intake
 - 19-11. Calcium intake
 - 19-15. Meals and snacks at school
 - 19-16. Worksite promotion of nutrition education and weight management

- 20. Occupational Safety and Health**
 - 20-2. Work-related injuries
 - 20-3. Overexertion or repetitive motion
 - 20-10. Needlestick injuries
- 22. Physical Activity and Fitness**
 - 22-4. Muscular strength and endurance
 - 22-5. Flexibility
- 23. Public Health Infrastructure**
 - 23-1. Public health employee access to the Internet
 - 23-2. Public access to information and surveillance data
 - 23-3. Use of geocoding in health data systems
 - 23-4. Data for all population groups
 - 23-6. National tracking of Healthy People 2010 objectives
 - 23-7. Timely release of data on objectives
 - 23-8. Competencies for public health workers
 - 23-9. Training in essential public health services
 - 23-10. Continuing education and training by public health agencies
 - 23-11. Performance standards for essential public health services
 - 23-12. Health improvement plans
 - 23-13. Access to public health laboratory services
 - 23-14. Access to epidemiology services
 - 23-16. Data on public health expenditures
 - 23-17. Population-based prevention research
- 25. Sexually Transmitted Diseases**
 - 25-5. Human papillomavirus infection
- 26. Substance Abuse**
 - 26-12. Average annual alcohol consumption
- 27. Tobacco Use**
 - 27-1. Adult tobacco use
 - 27-2. Adolescent tobacco use
 - 27-3. Initiation of tobacco use
 - 27-4. Age at first tobacco use
 - 27-5. Smoking cessation by adults
 - 27-7. Smoking cessation by adolescents
 - 27-8. Insurance coverage of cessation treatment
 - 27-11. Smoke-free and tobacco-free schools
 - 27-12. Worksite smoking policies
 - 27-14. Enforcement of illegal tobacco sales to minors laws
 - 27-15. Retail license suspension for sales to minors
 - 27-18. Tobacco control programs
 - 27-19. Preemptive tobacco control laws
 - 27-20. Tobacco product regulation
 - 27-21. Tobacco tax

Terminology

(A listing of abbreviations and acronyms used in this publication appears in Appendix H.)

Candidiasis (oral): Yeast or fungal infection that occurs in the oral cavity or pharynx or both.

Cleft lip or palate: A congenital opening or fissure occurring in the lip or palate.

Congenital anomaly: An unusual condition existing at, and usually before, birth.

Craniofacial: Pertaining to the head and face.

Dental caries (dental decay or cavities): An infectious disease that results in demineralization and ultimately cavitation of the tooth surface if not controlled or remineralized. Dental cavities may be either treated (filled) or untreated (unfilled).

Caries experience: The sum of filled and unfilled cavities, along with any missing teeth resulting from decay.

Early childhood caries (ECC): Dental decay of the primary teeth of infants and young children (aged 1 to 5 years) often characterized by rapid destruction.

Root caries: Dental decay that occurs on the root portion of a tooth. (In younger persons, root surfaces are usually covered by gum [gingival] tissue.)

Dentate: A condition characterized by having one or more natural teeth.

Edentulism/edentulous: A condition characterized by not having any natural teeth.

Endocarditis: Inflammation of the lining of the heart.

Fluoride: A compound of the element fluorine. Fluorine, the 13th most abundant element in nature, is used in a variety of ways to reduce dental decay.

Gingivitis: An inflammatory condition of the gum tissue, which can appear reddened and swollen and frequently bleeds easily.

Oral cavity: Mouth.

Oral health literacy: Based on the definition of health literacy,⁶⁵ the degree to which individuals have the capacity to obtain, process, and understand basic oral and craniofacial health information and services needed to make appropriate health decisions.

Periodontal disease: A cluster of diseases caused by bacterial infections and resulting in inflammatory responses and chronic destruction of the soft tissues and bone that support the teeth. Periodontal disease is a broad term encompassing several diseases of the gums and tissues supporting the teeth.

Pharynx: Throat.

Sealants: Plastic coatings applied to the surfaces of teeth with developmental pits and grooves (primarily chewing surfaces) to protect the tooth surfaces from collecting food, debris, and bacteria that promote the development of dental decay.

Soft tissue lesion: An abnormality of the soft tissues of the oral cavity or pharynx.

Squamous cell carcinoma: A type of cancer that occurs in tissues that line major organs.

Xerostomia: A condition in which the mouth is dry because of a lack of saliva.

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