

The Oral Health of American Indian and Alaska Native Adult Dental Patients 35 Years and Older A Follow-up Report to the 2015 Survey

Kathy R. Phipps, DrPH, Timothy L. Ricks, DMD, MPH, FICD, Nathan P. Mork, DDS, MPH, and Timothy L. Lozon, DDS

Key Findings

1. The oral health of AI/AN adult dental patients continues to improve. Fewer have untreated decay, and more adults have a functional dentition.
2. Compared to the general U.S. population, AI/AN adult dental patients are twice as likely to have untreated decay, but the disparities gap is narrowing.
3. American Indian and Alaska Native adult dental patients are more likely to have severe periodontal disease than the general U.S. population.
4. American Indian and Alaska Native adult dental patients are more likely to have missing teeth than the general U.S. population.
5. Compared to the general U.S. population, AI/AN adult dental patients are more likely to report poor oral health and oral pain.
6. The COVID-19 pandemic stresses an already overburdened dental care delivery system. Compared to 2015, the percentage of AI/AN dental patients reporting a dental visit in the last year was lower and the primary reason for not visiting a dentist was COVID-19.

Introduction

Oral health is essential for the overall health and well-being of adults. Unfortunately, as outlined in a previous IHS report¹ and highlighted in a recent national report, *Oral Health in American: Advances and Challenges*,² American Indian and Alaska Native (AI/AN) adults suffer disproportionately from a variety of oral diseases including dental caries (tooth decay), periodontal (gum) disease, and tooth loss. Social and commercial determinants of oral health, including oral health literacy, housing instability, job security, food insecurity, cultural and familial values

of oral health, and others, all play a critical role in not only the burden of oral disease in the AI/AN population, but also in accessing affordable, culturally competent, and geographically available oral health services.

Dental caries is a multi-factorial disease process initiated by bacteria which metabolize sugars to form acids. These acids demineralize the tooth surface and eventually form a cavity that, if left untreated, can cause pain, infection, and tooth loss. Tooth

What's New in This Report?

- Improvements in this age group align with reductions in oral disease previously reported in data briefs on the oral health of AI/AN children and adolescents.
- For the first time, this data brief evaluates changes in disparities between AI/AN adults and the general U.S. population, showing a narrowing of the gap in the prevalence of both untreated decay and missing teeth.



decay is preventable by a combination of community, professional, and individual measures including water fluoridation, dental sealants, professionally applied topical fluorides, use of fluoride toothpastes at home, and a healthy diet. Periodontal disease is also a multi-factorial disease process initiated by oral bacteria. If left untreated, it can result in the loss of the bone that holds the teeth in the jaw. Over time, the teeth can become loose, painful and may be lost. Certain medical and lifestyle conditions increase an individual’s likelihood of having severe periodontal disease, including smoking and diabetes. The best ways to prevent periodontal disease are to avoid smoking, maintain a healthy lifestyle, have regular dental cleanings, and practice good oral hygiene.^{3,4}

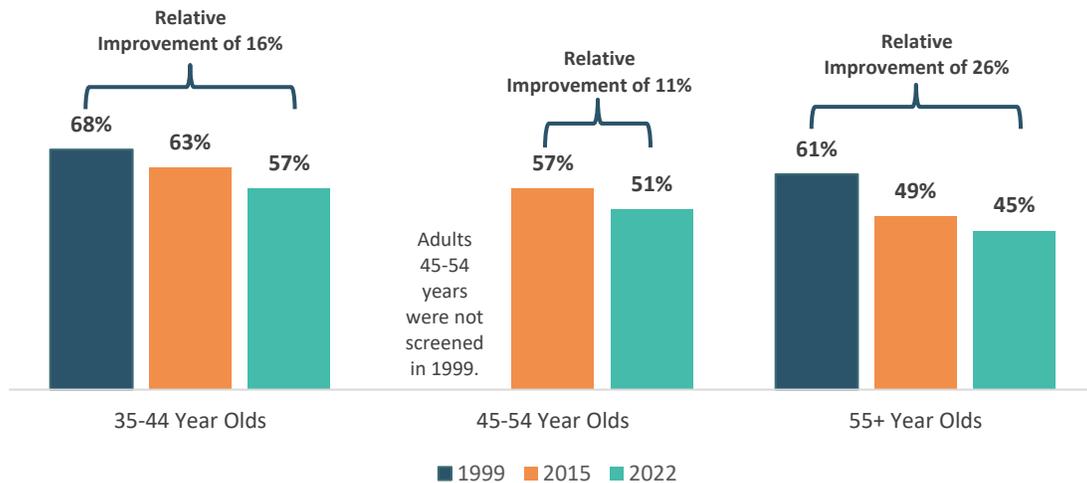
Poor oral health can have a negative effect on general health. For example, severe periodontal disease can adversely affect glycemic control in adults with diabetes and there is a direct relationship between periodontal disease severity and diabetes complications.⁵ Advanced dental caries can cause pain and infection, and can result in problems with

eating, chewing, smiling, and communication. Having missing, discolored or damaged teeth can impact a person’s quality of life by lowering self-esteem and, for some, reducing opportunities for employment.⁶ Furthermore, having a functional dentition (20 or more teeth) is needed to maintain good nutrition because adults with less than 20 teeth may experience nutritional deficiencies because they are less likely to meet current dietary recommendations.

The 2022 IHS Oral Health Survey is the fifth look at the oral health status of AI/AN adult dental patients served by IHS and Tribal clinics. IHS conducted surveys in 1984, 1991, 1999, and 2015. For the 2022 Oral Health Survey, the IHS collected data from 6,336 dental patients ranging in age from 35 to 98 years. This data brief focuses on the oral health of adult dental patients. It presents information on the prevalence of dental caries, severe periodontal disease, and tooth loss; assesses trends over time; and compares the oral health of AI/AN adults to the general U.S. population. The results of the 2022 oral health survey are presented as six key findings.

Key Finding 1: The oral health of AI/AN adult dental patients continues to improve. Fewer have untreated decay, and more adults have a functional dentition.

Figure 1: Percentage of AI/AN Dental Patients with Untreated Decay by Age Group and Survey Year; 1999, 2015 and 2022



The percentage of AI/AN adult dental patients with untreated decay in 1999, 2015 and 2022 by age group is displayed in Figure 1. Across all age groups, the percentage with untreated decay has steadily decreased with the largest relative improvement occurring among elders aged 55+ years. In 1999, 61% of AI/AN elders had untreated decay compared to 45% in 2022 – a relative improvement of 26%.

One of the long-term consequences of untreated decay is tooth loss. An important concept that relates tooth loss to quality of life is a functional dentition, having enough natural teeth so that basic oral functions, such as chewing, speaking and esthetics, are preserved. Having a non-functional dentition compromises an individual’s ability to eat,

affecting their nutritional intake and overall health. It has been shown that severe tooth loss is associated with limited consumption of fruits and vegetables, increased consumption of sugary and easy-to-chew foods, and lower dietary intake of fiber and vitamins.⁷ The World Health Organization (WHO) defines a functional dentition as having 20 or more natural teeth while the definition used for reporting National Health and Nutrition Examination Survey (NHANES) data is 21 or more natural teeth.^{8,9} In this report we use the WHO definition when looking at long-term trends because 20+ teeth was the cut point used in the 1984 IHS survey. When making comparisons between IHS and national data, the NHANES definition, when available, is used.

Figure 2: Percentage of AI/AN Dental Patients with a Functional Dentition (20+ Teeth) by Age Group and Survey Year, 1984, 1999, 2015 and 2022

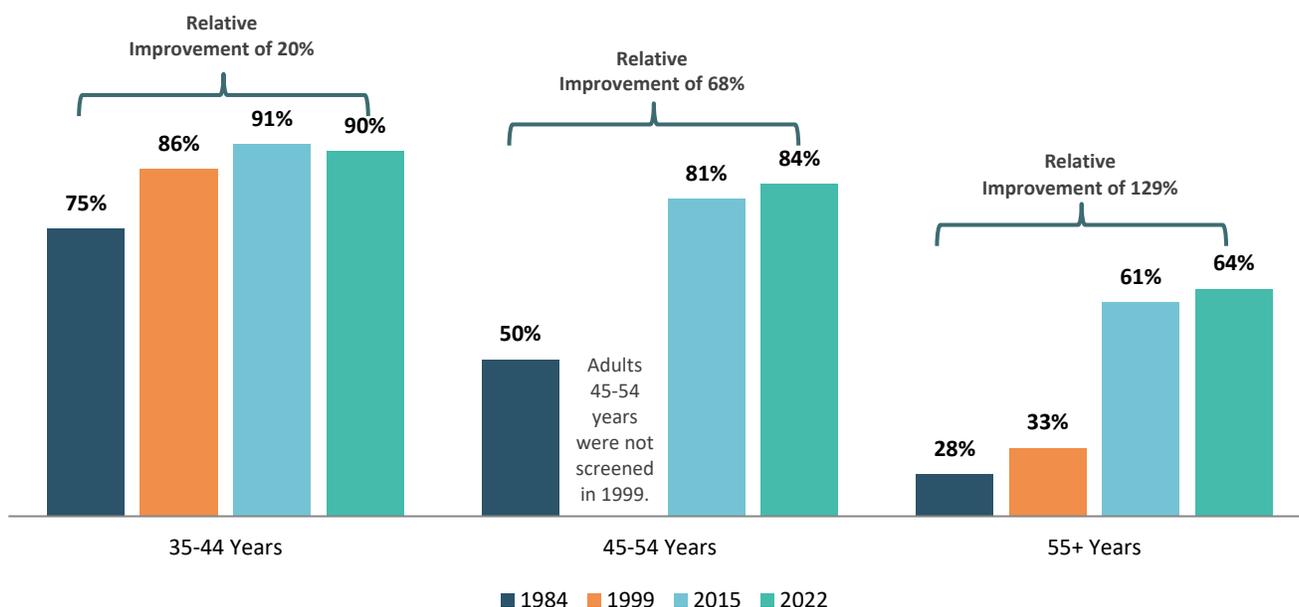


Figure 2 presents the percentage of AI/AN adult dental patients with 20 or more teeth by age group based on IHS, Tribal and Urban (I/T/U) clinic-based surveillance activities completed in 1984, 1999, 2015, and 2022. For all age groups, the percentage of adults with 20+ teeth is substantially higher in 2022 compared to 1984. For adults 55+ years, a

major improvement occurred between 1999 and 2015 with a slight improvement between 2015, and 2022. Compared to the national average for adults 65+ years, AI/AN dental patients are less likely to have a functional dentition defined as having 21+ teeth – 65% of the overall U.S. older adult population has a functional dentition compared to 54% of AI/AN



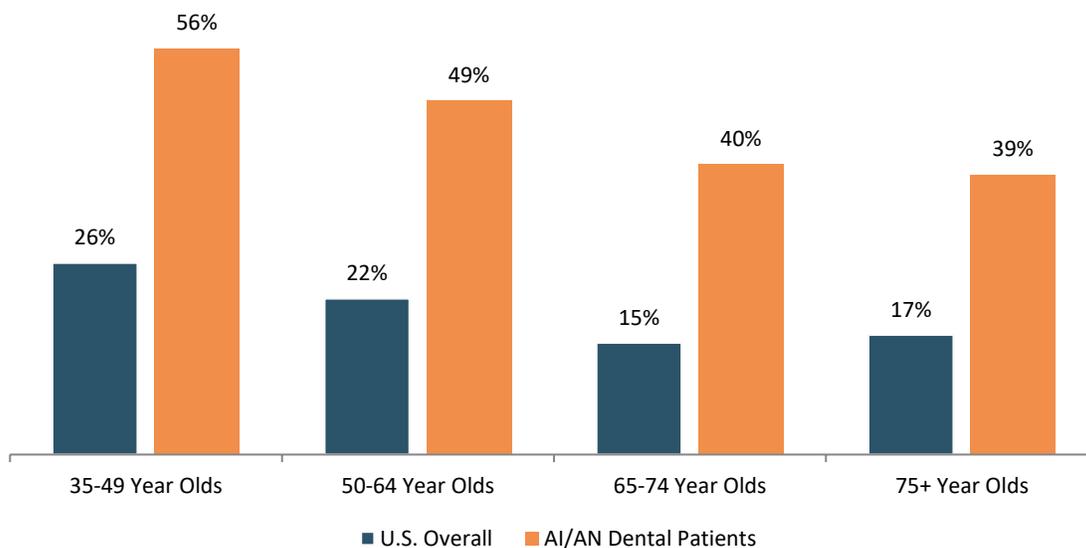
dental patients.² It should be noted that our survey of AI/AN dental patients likely overestimates the percentage of the population with a functional dentition because adults with no teeth are significantly less likely to visit a dentist or dental clinic.

Various changes over the past two decades may help explain the improvements in the oral health status of AI/AN adult dental patients. Access to dental care has continued to increase in I/T/U dental programs funded by the Indian Health Service. In 2010, for example, the proportion of AI/AN adults using the IHS healthcare system who were able to access dental services was 23.4% for 35-44 year-olds, 26.2%

for 45-54 year-olds, 26.8% for 55-74 year-olds, and 20.5% for those 75 years old and older. By 2018, however, the proportion of AI/AN adults using the system and accessing dental care increased to 24.2% (35-44), 27.4% (45-54), 30.6% (55-74), and 24.5% (75+), respectively. Other positive changes which may have influenced the changes in oral health status of AI/AN adult dental patients include a decrease in dental vacancies; implementation of the dental therapist program; training of dental assistants to provide expanded function basic periodontal services especially at remote locations without a dental hygienist; and increased preventive services provided to adult dental patients.

Key Finding 2: Compared to the general U.S. population, AI/AN adult dental patients are twice as likely to have untreated decay, but the disparities gap is narrowing.

Figure 3: Percentage of Adults with Untreated Dental Caries by Age Group U.S. Overall (NHANES 2011-2016)¹⁰ vs. AI/AN Dental Patients (IHS 2022)



Regardless of age, AI/AN adult dental patients have a substantially higher prevalence of untreated caries than the general U.S. population. For example, among adults aged 35-49 years, 26% of the general U.S. population has untreated caries compared to 56% of AI/AN dental patients (Figure 3).¹⁰ When

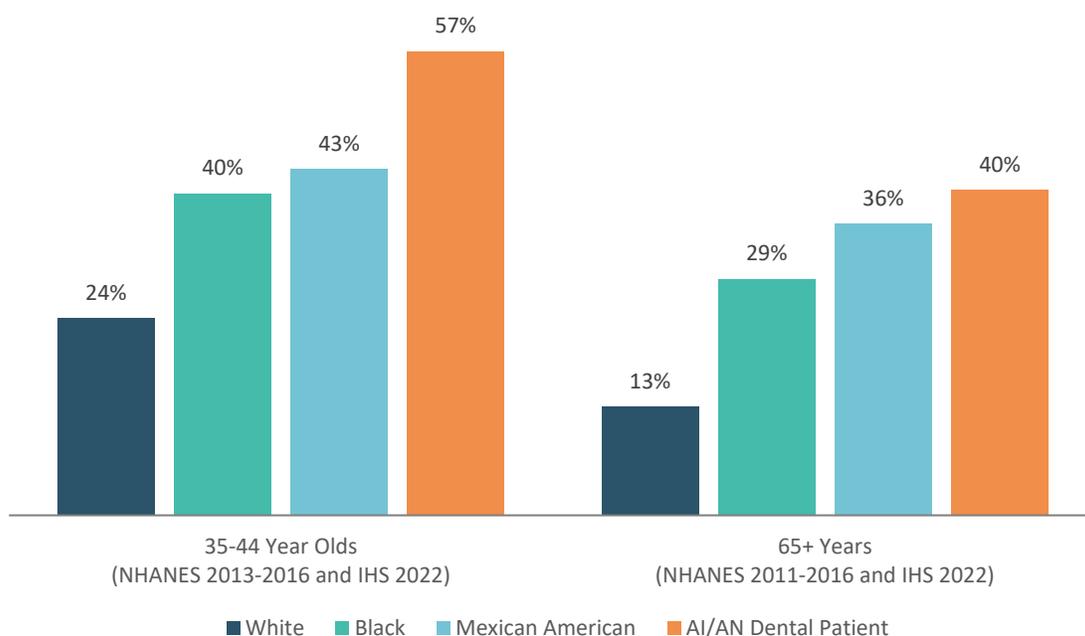
compared to other racial/ethnic groups (Figure 4), AI/AN dental patients aged 35-44 years, are more than twice as likely to have untreated decay as U.S. Whites (57% vs. 24% respectively) and about 30% more likely than the next highest minority group, Mexican-Americans (57% vs. 43% respectively).¹¹ For



those 65 years and older, AI/ANs have three times as much untreated decay as U.S. Whites (40% vs. 13% respectively) and over 10% more than the next highest minority group, Mexican-Americans (40% vs. 36% respectively).¹⁰ There are probably two main reasons why such a high percent of AI/AN adults have untreated decay. First, the relative geographic isolation of many Tribal populations may limit access to dental care. Second, is the inability of AI/AN patients to access routine and preventive dental care due to other reasons such as staffing shortages.

Additionally, the lower prevalence of untreated caries in the U.S. population, compared to AI/AN dental patients, may be partially due to differences in sampling strategies. Information for the general U.S. population and other racial/ethnic groups was obtained through the National Health and Nutrition Examination Survey (NHANES); a non-clinic-based survey. Because some AI/ANs seek dental care when there is a problem, our survey may overestimate the prevalence of untreated decay.

Figure 4: Percentage of Adults with Untreated Dental Caries by Age Group and Race/Ethnicity (NHANES 2013-2016,¹¹ NHANES 2011-2016,¹⁰ and IHS 2022)



One of the goals of Healthy People, the federal government’s prevention agenda for building a healthier Nation, is to eliminate health disparities.¹² Figure 5 displays the prevalence of untreated dental caries among adults aged 65+ years at two different points in time. For the general U.S. population, the points in time are 1999-2004 and 2011-2016 while the points in time for the AI/AN elders are 1999 and 2022. Although the time points are not identical, they are comparable. AI/AN adults have more diseases at both points in time, but the good news is that the difference is decreasing. In other words,

while substantial disparities still exist, the disparity is narrowing.

When we look at the percentage of the population with a functional dentition, the disparities gap between the general U.S. population and AI/AN dental patients have been eliminated. Figure 6 displays the prevalence of functional dentition among older adults (65+ years for the general U.S. population and 55+ years for AI/AN dental patients) at two different points in time. For the general U.S. population, the points in time are 1988-1994 and



2011-2014 while the points in time for the AI/AN adults are 1984 and 2022. Although the times points, age range, and definition of a functional dentition differ, the comparison shows that the disparities gap has been virtually eliminated. It should be noted that our survey of AI/AN dental patients likely overestimates the percentage of the population with a functional dentition because adults with no teeth are significantly less likely to visit a dentist or dental

clinic. If we are to eliminate all oral health disparities, IHS and Tribal programs must expand evidence-based oral disease prevention programs; increase use of the dental care delivery system; work with Tribal communities to improve oral health literacy; and be aware of social determinants that negatively impact the health of the AI/AN population including poverty, geographic isolation, and historical trauma.

Figure 5: Percentage of Adults Aged 65+ with Untreated Dental Caries by Year U.S. Overall (1999-2004, 2011-2016)¹⁰ vs. AI/AN Dental Patients (1999, 2022)

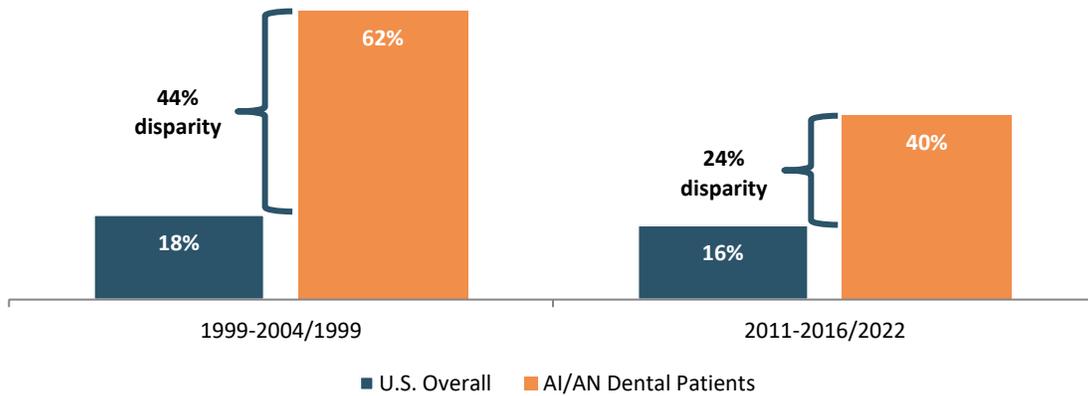
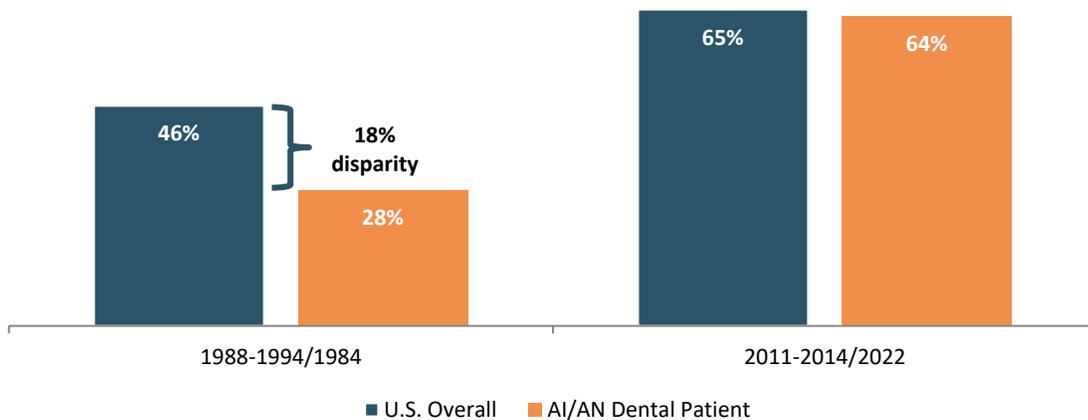


Figure 6: Percentage of Older Adults (65+ for U.S. and 55+ for AI/AN) with a Functional Dentition* by Year U.S. Overall (1988-1994, 2011-2014)¹⁰ vs. AI/AN Dental Patients (1984, 2022)



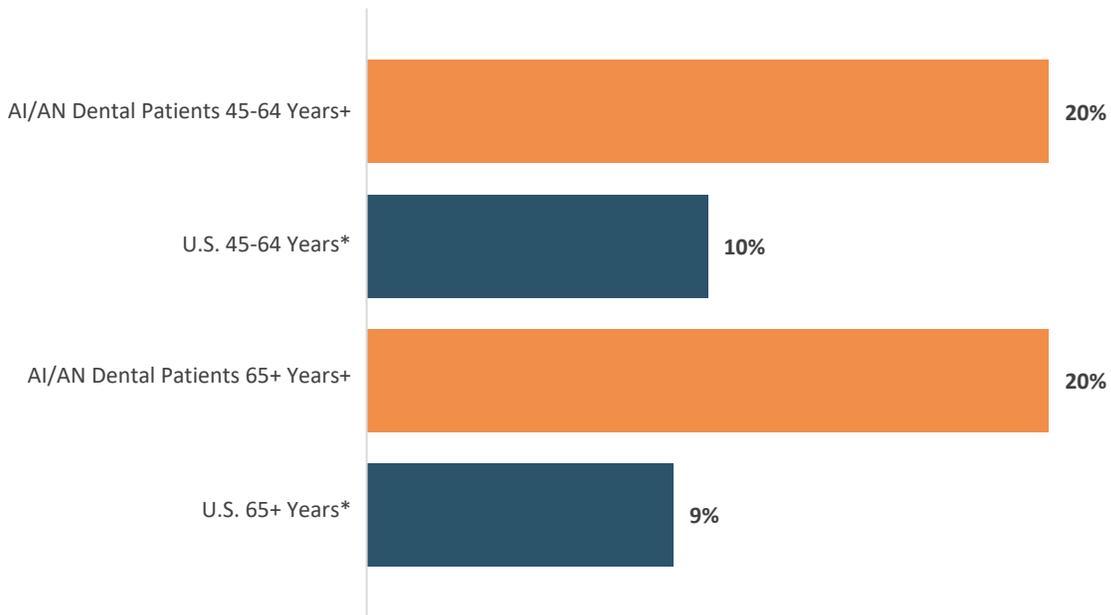
* The data source for the U.S. population defines functional dentition as 21+ teeth while the data source for the AI/AN population defines functional dentition as 20+ teeth.

Key Finding 3: American Indian and Alaska Native adult dental patients are more likely to have severe periodontal disease than the general U.S. population.

Periodontal disease is an inflammatory disease that affects the soft and hard tissues that support the teeth. As the disease progresses, the supporting tissues are destroyed, bone can be lost, and the teeth may loosen or eventually fall out. Severe periodontal disease can adversely affect glycemic control in adults with diabetes and there is a direct relationship between periodontal disease severity and diabetes complications.¹³ About 10% of U.S. adults aged 45+ years have severe periodontal disease compared to about 20% of similarly aged AI/AN dental patients (Figure 7).¹⁴ Smoking and diabetes are risk factors for periodontal disease and the prevalence of severe periodontal disease is higher among AI/AN adults who smoke than among

non-smokers (26% vs. 17% respectively) and among those with diabetes compared to those without diabetes (21% vs. 17%). AI/ANs have a higher prevalence of current smoking than most other racial/ethnic groups in the United States. In 2020, 27% of AI/AN adults in the United States smoked cigarettes, while 13% of U.S. adults overall smoked cigarettes.¹⁵ Tobacco sold on Tribal lands is typically not subject to state and national taxes, which reduces costs and lower prices are associated with increased smoking rates.¹⁶ In addition, AI/ANs are the racial/ethnic group with the highest prevalence of diagnosed diabetes, 15% of AI/ANs have been diagnosed with diabetes compared to 9% of the overall U.S. population.¹⁷

Figure 7: Percentage of Adults with Severe Periodontal Disease by Age Group U.S. Overall (NHANES 2009-2014)¹⁴ vs. AI/AN Dental Patients (IHS 2022)



+ Periodontal pockets \geq 5.5mm
 * Periodontal pockets \geq 6.0 mm

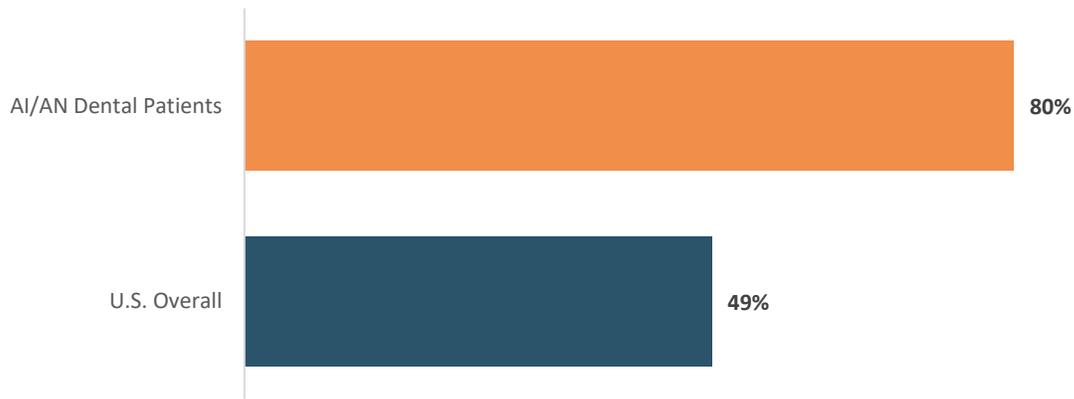


Key Finding 4: American Indian and Alaska Native adult dental patients are more likely to have missing teeth than the general U.S. population.

When left untreated, dental caries and periodontal disease can lead to tooth loss. Missing teeth can impact a person’s quality of life, lowering self-esteem and reducing employment opportunities for some. In addition, persons with extensive or complete tooth loss are more likely to substitute easier-to-chew foods such as those rich in saturated fats and cholesterol. About 80% of AI/AN adult

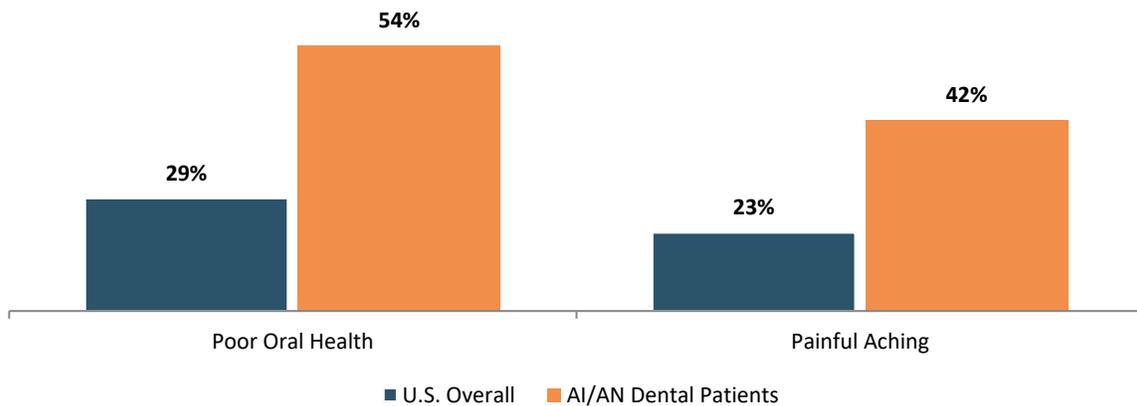
dental patients aged 45-64 years have lost at least one permanent tooth compared to 49% of the general U.S. population of the same age range (Figure 8).¹⁸ Our AI/AN dental patient survey likely underestimates the percentage of the population with missing teeth because adults with no teeth are significantly less likely to visit a dentist or dental clinic.

Figure 8: Percentage of Adults Aged 45-64 Years with One or More Missing Teeth U.S. Overall (BRFSS, 2020)¹⁸ vs. AI/AN Dental Patients (IHS 2022)



Key Finding 5: Compared to the general U.S. population, AI/AN adult dental patients are more likely to report poor oral health and oral pain.

Figure 9: Percentage of Adults 35+ Years that Reported Having Fair/Poor Oral Health or Painful Aching in the Mouth During Last Year; U.S. Overall (NHANES 2017- March 2020)¹⁹ vs. AI/AN Dental Patients (IHS 2022)



The 2022 IHS Oral Health Survey included a patient questionnaire which asked the following questions about the condition of an individual’s mouth and oral problems:

- How would you describe the condition of your mouth and teeth, including false teeth or dentures? (excellent, very good, good, fair, poor)
- How often during the last year have you had painful aching anywhere in the mouth? (very often, fairly often, occasionally, hardly ever, never)

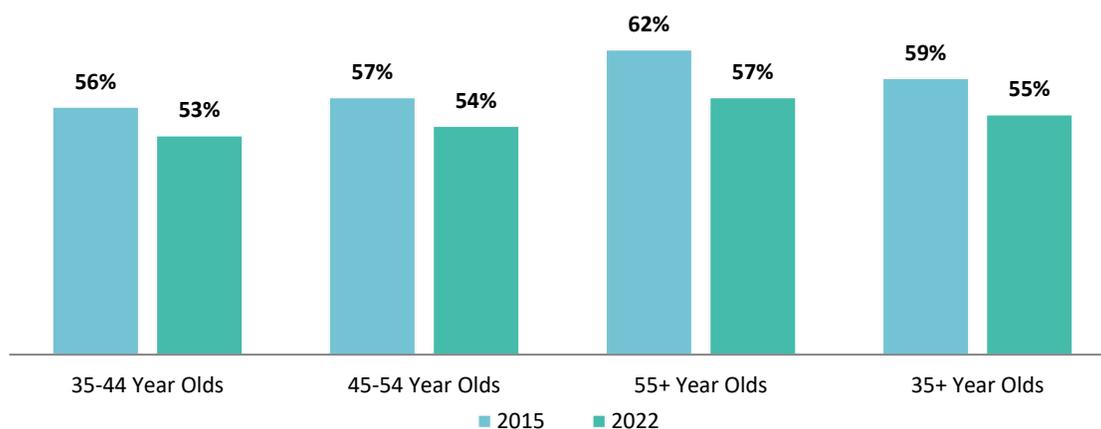
AI/AN dental patients, compared to the general U.S. population, were more likely to report that their oral health was poor/fair and that they had painful aching

either very often, fairly often, or occasionally. For example, AI/AN dental patients were almost twice as likely to report painful aching (42% vs. 23%) compared to the general U.S. population (Figure 9).¹⁹ The higher prevalence of painful aching is likely due to the higher prevalence of untreated caries among AI/AN adults (Figure 3).

These questions were also included in the 2015 IHS Oral Health Survey of AI/AN Adult Dental Patients, and although more AI/AN dental patients reported poor oral health in 2022 compared to 2015 (54% vs. 50%), the difference was not statistically significant. There was no difference in the percentage reporting painful aching (42% in 2022 vs. 43% in 2015).

Key Finding 6: The COVID-19 pandemic stresses an already overburdened dental care delivery system. Compared to 2015, the percentage of AI/AN dental patients reporting a dental visit in the last year was lower and the primary reason for not visiting a dentist was COVID-19.

Figure 10: Percentage of AI/AN Dental Patients Reporting a Dental Visit in the Last Year by Age Group and Survey Year, 2015 and 2022



On March 11, 2020, the World Health Organization declared the global spread of coronavirus disease 2019 (COVID-19) a pandemic and five days later the American Dental Association (ADA) recommended that dental practices postpone elective dental procedures and provide emergency-only dental services. As a result, access to dental care substantially decreased. During the week of March

23, 2020, an ADA Health Policy Institute survey found that 76% of private practice dental offices surveyed were closed but seeing emergency patients only, 19% were completely closed, and 5% were open but seeing a lower volume of patients.²⁰ Because the AI/AN population was disproportionately affected by COVID-19, many IHS, Tribal, and Urban dental programs shut down routine care for a few months



(March 2020 to June 2020), while others continued to provide emergency-only oral health services for many months because of local transmission rates, disruptions in the supply chain, and deployment of dental personnel in support of the overall health clinic COVID-19 response. A March 2022 survey of I/T/U dental programs found that 84% had resumed delivery of routine dental services while 97% of private practice offices had resumed routine care as of June 15, 2020.^{20,21} In addition, the pandemic resulted in an increase in I/T/U dental clinic staff vacancies – 34% of dental programs report dentist vacancies, 36% have dental hygiene vacancies, and 62% have vacancies for dental assistants.²¹

To maintain good oral health, most adults at moderate to high risk of developing dental disease should visit a dentist at least once per year.²³ Of the

AI/AN dental patients surveyed in 2022, almost half (45%) reported that they had NOT visited a dentist in the last year and the primary reason for no dental visit was COVID-19. As would be expected, most I/T/U clinics have a backlog of dental patients and obtaining a dental appointment can be difficult resulting in an increase in emergency/walk-in patients. For example, in the Navajo Area, which was hit particularly hard by COVID-19, approximately 57% of the adults screened in 2022 were emergency/walk-in patients.

The emergence of novel pathogens, such as COVID-19, and other large-scale emergencies underscore the need for public-private partnerships that plan and ensure the continued delivery of essential oral health care in times of crisis.²

Data Source and Methods

The primary data source for this brief is the 2022 IHS Oral Health Survey of AI/AN dental patients aged 35+ years which collected data from November 2021 through March 2022. The survey had two components – a dental screening and an optional patient questionnaire. A total of 6,336 AI/AN adults aged 35-98 years were screened and 6,158 completed a questionnaire. The sampling frame for the 2022 survey consisted of all service units with a dental clinic and an estimated 35+ year old user population of 100 or more. A stratified probability proportional to size (PPS) cluster sampling design was used to select IHS service units. The sampling frame was stratified by IHS Area, and service units were sorted within each Area based on operational status (Tribal or IHS) and/or state. A systematic PPS sampling scheme was used to select 64 service units. If a service unit refused to participate, another service unit within the same sampling interval was randomly selected. Due to issues associated with the COVID-19 pandemic, only 38 of the service units in the original sample participated (59%). An additional

seven service units volunteered to participate. Because of underrepresentation of some IHS Areas, results should be viewed with caution.

The dental screening collected the following information for each person: age, sex, presence of diabetes, use of tobacco products, tooth status, Community Periodontal Index, presence of removable dentures, need for removable dentures, and urgency of need for dental treatment. We used the *Basic Screening Survey* clinical indicator definitions and data collection protocols.²⁴ The patient questionnaire collected self-reported age, frequency of oral pain, frequency of food avoidance because of oral problems, condition of mouth, time since last dental visit, and reasons for not visiting the dentist in the last year.

Examiners included dentists, dental hygienists and dental therapists employed by IHS or Tribal programs. Examiners were required to view an examiner training webinar; no formal calibration was



undertaken and examiner reliability was not assessed. Screenings were completed in the dental clinic using dental mirrors and an external light source. Examiners collected data using paper forms which were mailed to a central location. All statistical analyses were performed using SAS (Version 9.4; SAS Institute Inc., Cary, NC). Due to underrepresentation of some IHS Areas, results were not weighted for the complex sampling scheme.

Limitations

This was a survey of dental patients seeking treatment at Tribal or IHS dental clinics and it is not representative of the general population of American Indians and Alaska Natives. Because some AI/ANs seek dental care only when there is a problem, this survey may overestimate the prevalence of dental disease among all age groups. In addition, because adults without teeth are less likely to visit a dentist, this survey may underestimate the prevalence of total tooth loss and overestimate the percentage of the population with a functional dentition. It should also be noted that this survey was completed after the onset of the COVID-19 pandemic while all national data were collected prior to the pandemic.

Definitions

- Untreated decay: Describes dental cavities or tooth decay that have not received appropriate treatment.

- Periodontal disease: An inflammatory disease that affects the soft and hard structures that support the teeth.
- Severe periodontal disease: Refers to individuals that, using the Community Periodontal Index (CPI), have periodontal pockets ≥ 5.5 mm (CPI=4).²⁵

Acronyms

- ADA: American Dental Association
- AI/AN: American Indian or Alaska Native
- CPI: Community Periodontal Index
- IHS: Indian Health Service
- I/T/U: IHS, Tribal and Urban Indian Programs
- NHANES: National Health and Nutrition Examination Survey
- WHO: World Health Organization

About the Authors

Kathy R. Phipps is an oral health surveillance consultant in Morro Bay, California. Timothy L. Ricks is the oral health surveillance coordinator in the IHS Division of Oral Health in Rockville, Maryland, and chief dental officer of the U.S. Public Health Service. Nathan P. Mork is the oral health surveillance coordinator in the IHS Division of Oral Health in Rockville, Maryland. Timothy L. Lozon is the director of the IHS Division of Oral Health in Rockville, Maryland.



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Data Tables

Table 1: Number of AI/AN adults screened by IHS area and age group, 2022

IHS Area	35 44 Years	45 54 Years	55+ Years	Total
Alaska	136	104	201	441
Albuquerque	158	153	256	567
Bemidji	327	297	597	1,221
Billings	174	154	225	553
California	221	212	339	772
Great Plains	28	33	55	116
Nashville	170	182	235	587
Navajo	210	220	355	785
Oklahoma City	129	134	289	552
Phoenix	205	159	338	702
Portland & Tucson	11	11	18	40
IHS Overall	1,769	1,659	2,908	6,336

*PORTLAND & TUCSON AREAS WERE COMBINED DUE TO THE SMALL SAMPLE SIZE

Table 2: Number of questionnaires completed by AI/AN adults by IHS area and age group, 2022

IHS Area	35 44 Years	45 54 Years	55+ Years	Total
Alaska	157	131	216	504
Albuquerque	156	155	249	560
Bemidji	272	260	531	1,063
Billings	140	126	199	465
California	197	188	372	757
Great Plains	28	33	55	116
Nashville	99	109	146	354
Navajo	196	181	359	736
Oklahoma City	203	198	479	880
Phoenix	203	161	327	691
Portland & Tucson	10	9	13	32
IHS Overall	1,661	1,551	2,946	6,158

*PORTLAND & TUCSON AREAS WERE COMBINED DUE TO THE SMALL SAMPLE SIZE

Table 3: Tooth loss among dentate and edentulous AI/AN adults by age group, 2022 (3rd molars excluded)

Tooth Loss Variable	35 44 Years (n=1,749)	45 54 Years (n=1,651)	55+ Years (n=2,884)
% with all 28 teeth	32.8	24.7	11.2
% with 20+ teeth	89.8	83.5	63.5
% with 0 teeth (edentulous)	1.1	1.6	5.9



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Table 4: Percent with untreated decay, mean number of teeth present, and mean number of teeth decayed, missing due to oral disease, or filled among dentate AI/AN adults by age group, 2022 (3rd molars excluded)

Tooth Loss Variable	35 44 Years (n=1,729)	45 54 Years (n=1,624)	55+ Years (n=2,715)
% with untreated decay	57.1	51.1	44.7
Mean number of teeth present	25.1	23.9	21.0
Mean number of...			
Decayed teeth	2.7	2.2	1.6
Missing teeth	2.9	4.1	7.0
Filled teeth	7.3	8.4	9.7
Mean DMFT	12.9	14.7	18.3
Mean DFT	10.1	10.7	11.3

Table 5: Highest Community Periodontal Index (CPI) score among dentate AI/AN adults by age group, 2022

Variable	35 44 Years (n=1,693)	45 54 Years (n=1,568)	55+ Years (n=2,636)
% with highest CPI score			
0 (no disease)	4.9	4.3	4.8
1 (bleeding, no calculus/no pockets)	15.1	13.1	10.6
2 (calculus, no pockets)	31.3	26.7	24.3
3 (pockets 3.5-5.4 mm)	34.3	36.9	39.8
4 (pockets >=5.5 mm)	14.4	19.0	20.5

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For Further Information

Indian Health Service
Office of Clinical and Preventive Services
Division of Oral Health
5600 Fishers Lane, Mail Stop 08N34 A
Rockville, MD 20857
(301) 443-1106

