WISCONSIN — DEPARTMENT OF HEALTH SERVICES

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For additional information on the Wisconsin Oral Health Program, please visit the website at https://www.dhs.wisconsin.gov/oral-health/index.htm

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EXECUTIVE SUMMARY

In 2010 and 2011, the Wisconsin Department of Health Services added a Basic Screening Survey (BSS) on oral health to the Survey of the Health of Wisconsin, a statewide survey that collects physical measurements and self-reported survey information on adults aged 21 to 74 years. A total of 1,495 adults participated in the BSS and self-reported survey questions. Results from the three screening indicators and survey information on oral health status and dental services were analyzed and stratified by race/ethnicity, income, and disability status. Overall, while oral health problems and difficulties with dental service access appeared low in Wisconsin, disparities for vulnerable populations represented a significant concern. These results may also be underestimates of disease due to the screening protocol only capturing easily observable signs of oral health issues. Several key findings were highlighted.

Key Findings

- In the BSS, 13 percent of Wisconsin adults had complete tooth loss, 15 percent had untreated tooth decay, and 16 percent needed dental care.
- Blacks were significantly twice as likely to have untreated decay and a need for dental care as whites in the BSS while racial/ethnic minority groups were also significantly more likely to report having oral health problems and difficulty gaining access to dental services.
- Adults with an income less than $25,000 had significantly higher percentages of untreated decay, need for dental care, and self-reported oral health problems.
- Adults with disabilities experienced a higher prevalence of untreated decay and need for dental care. In particular, adults with a mental or intellectual disorder were significantly nearly twice as likely to report discomfort when eating as adults without a disorder. Adults with a chronic condition were significantly 1.5 times more likely to report painful aching in the mouth and ever having gum disease as adults without a chronic condition.

INTRODUCTION

Oral health is an essential component of general health. Without good oral health, basic human functions such as chewing, swallowing, and speaking would not be possible. When considering oral health, healthy teeth are important, but it also refers to the whole mouth, which includes gums, hard and soft palate, linings of the mouth and throat, tongue, lips, salivary glands, chewing muscles, and upper and lower jaws.

While tooth decay (dental caries) and gum (periodontal) disease are largely preventable, they are among the most common chronic diseases in the United States. In the US, nearly 33 percent of all adults have untreated tooth decay and close to 25 percent of adults have reported some kind of facial pain in the past six months (1). The majority of adults show some indication of gum disease while severe gum disease impacts approximately 14 percent of adults aged 45 to 54 years (2). When tooth decay and gum disease are left untreated, serious complications can occur, including unnecessary pain, inability to eat or speak, poor appearance, reduced self-esteem, lost work days, and trouble with concentration on daily tasks (3). Among employed adults, it has been estimated that over 164 million hours of work each year have been lost because of oral health issues or dental visits (2). Research has also found associations between chronic oral diseases and diabetes, heart and lung disease, stroke, and adverse pregnancy outcomes (4). In high-risk populations such as hospitalized or elderly nursing home patients, poor oral health has been associated with nosocomial

pneumonia, making good oral care especially important in reducing the risk for these populations (5). Certain lifestyle behaviors, such as tobacco use, excessive alcohol use, and poor dietary practices, have also been associated with oral and pharyngeal cancers, gum disease, tooth decay, and candidiasis (4).

Additionally, disparities in oral health can be found by race/ethnicity, income, education, and disability.

- Overall, the racial/ethnic groups in the US with the poorest oral health are blacks, Hispanics, and American Indians/Alaska Natives. Blacks and Mexican Americans aged 35-44 years are nearly twice as likely to have untreated tooth decay as whites (6).
- Limited income or lack of insurance is also often cited as barriers to good oral health (4). It has been estimated that for every adult aged 19 years and older without medical insurance, there are three without dental insurance. Although 70 percent of adults reported having a dental visit in the past 12 months, those with incomes below the poverty level are much less likely to report having a dental visit than those with greater income. Among people aged 20 years and older, over 40 percent of poor adults have at least one tooth with untreated decay compared to 16 percent of non-poor adults (2).
- Among adults aged 35 to 44 years, those with less than a high school education are almost three times more likely to experience untreated tooth decay and destructive gum disease than those with at least some college education (6).
- People with disabilities experience tooth decay at a higher rate than those without disabilities. Research has also demonstrated that those with an intellectual or developmental disability have significantly greater rates of poor oral hygiene and need for gum disease treatment than the general population and this is partly because personal prevention practices or the ability to obtain needed services is hindered by their condition (4, 7). Not all dentists have the proper training and skills to be able to care for these patients in their offices, or their offices are not set up with the appropriate equipment and these patients may instead require hospital-based care.

This report assesses the oral health status of Wisconsin adults and highlights the oral health disparities faced by vulnerable populations. Oral health screening data have been available on the national level, but not at the state level. However, a unique opportunity to obtain oral health screening data was available through a collaboration between the University of Wisconsin School of Medicine and Public Health's Survey of the Health of Wisconsin (SHOW) and the Oral Health Program (OHP) at the Wisconsin Department of Health Services (DHS) in 2010.

METHODS

SHOW is a statewide survey modeled after the National Health and Nutrition Examination Survey (NHANES) that collects physical measurements, interview based data, self-reported data, and biosamples. Topics include demographics, health history, and health care utilization and behavior on adults aged 21 to 74 years. Data are collected from a representative sample of civilian non-institutionalized Wisconsin residents. A two-stage cluster approach used to select census block groups as the primary sampling units followed by the selection of households (8). In-person interviews, self-administered and computer-assisted questionnaires, physical exams, and bio-specimen collections are used to obtain data on participants.

In 2010 and 2011, DHS provided funding to SHOW to add the Basic Screening Survey (BSS), which is an oral health screening protocol developed by the Association of State and Territorial Dental Directors (ASTDD) (9). DHS staff spent over ten hours training and calibrating SHOW staff on the BSS protocol before data collection occurred, and held follow-up trainings throughout the data collection period for quality assurance and control. SHOW staff used only a flashlight and disposable mouth mirror to look for easily observable signs of oral health problems. The indicators this module assessed were the presence of natural teeth, untreated tooth decay, and need for dental care.

a) Natural teeth was coded as "Yes" if any natural teeth were present and coded as "No" if natural teeth were not present at all. For the analysis, this variable only included people 65 years of age or older. This age group was the focus due to people 65 years of age or older being much more likely to have lost all of their natural teeth, and aligns with the Healthy People 2020 objective for adults aged 65 to 74 who have lost all natural teeth.

b) Untreated tooth decay was defined as the presence of a dental cavity, in at least one tooth, in which the breakdown of the enamel surface could be easily observed by a screener. Only cavitated lesions were included.

c) Need for dental care was based on two variables: early and urgent need for treatment. Adults with no obvious dental problems were coded as having no obvious problems. Adults with untreated decay who did not have signs or symptoms of pain, infection, or swelling were coded as needing early treatment. Adults with untreated decay who had signs or symptoms were coded as needing urgent treatment. Because of small numbers, the early and urgent treatment need variables were combined into the need for dental care variable.

Self-reported information included demographics, perception of oral health, access and utilization to dental care, oral health behaviors, health history, and water consumption. Key oral health outcomes that were assessed included poor condition of teeth, painful aching in the mouth, and discomfort when eating. Poor condition of teeth was defined as condition of teeth being considered either poor or fair. Painful aching in the mouth was defined as having painful aching in the mouth very often, fairly often, or occasionally. Discomfort when eating was defined as having discomfort when eating very often, fairly often, or occasionally.

Certain demographics, such as race/ethnicity, income, education, and disability, were used to identify groups at higher risk for losing all of their natural teeth, untreated tooth decay, and need for dental care. Race/ethnicity was defined as being white, black, Hispanic, and other. Income was based on combined household income over the past 12 months before taxes and was divided into five categories: less than $25,000, $25,000 – $49,999, $50,000 – $74,999, $75,000 – $99,999, and $100,000 or more. Level of education was based on the highest level of schooling completed and was categorized as less than high school, high school degree or equivalent, some college, and associate or bachelor's degree or more. Disability was classified into mental or intellectual disorders (MID) and chronic conditions (Table 1). For analyses stratified by chronic condition, adults over 65 years of age were excluded because certain conditions, such as diabetes, are significantly greater in people over the age of 65 and could have skewed the results.

Table 1: Classification of Disability Variables

Mental or Intellectual Disorders (MID):	Chronic Conditions:
Alzheimer's Disease	Cancer
Learning Disability	Epilepsy
Mild Cognitive Impairment	Migraine Headache
Post-Traumatic Stress Disorder (PTSD)	Parkinson's Disease
Axiety	Rheumatoid Arthritis
Autism Spectrum Disorder	Asthma
	Diabetes

Due to small numbers, relative standard error (RSE) was used to assess reliability. RSE was calculated using the following formula, RSE (as a percentage) = (SE/Estimate)*100, where SE is the standard error of the estimate. Estimates with an RSE of greater than 30 percent but less than or equal to 50 percent must be used with caution since they do not meet standards of reliability or precision and were indicated with an asterisk symbol (*) in the tables. Estimates with an RSE greater than 50 percent were indicated with a section sign symbol (§) and not shown in the tables.

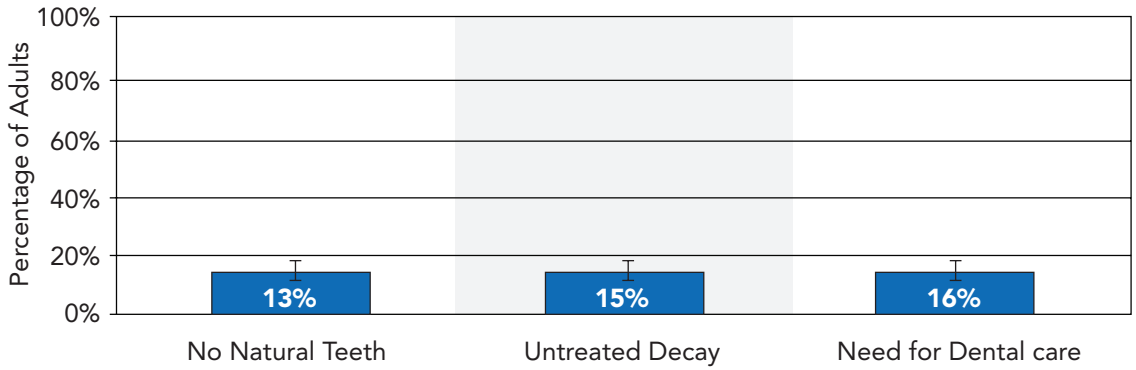
Data analysis, which included frequencies, cross-tabulations, logistic regression, and 95 percent confidence intervals, was completed using SAS versions 9.3 and 9.4. Risk factors including sex, race/ethnicity, income, education, smoking, heavy drinking, and disability status were evaluated for a possible relationship with untreated tooth decay and need for dental care. Multivariate logistic regression analyses were adjusted for sex, race/ethnicity, income, education, smoking, and heavy drinking.

RESULTS

The sample consisted of adults who were screened using the BSS protocol in 2010 and 2011 and represented a state-wide sample. A total of 1,495 adults participated in the BSS module. The majority of adults identified as white. Nearly half of the adults reported their household income to be less than $50,000, demonstrating a slight skew towards higher income. The sample was also skewed towards higher education (see Table 2). About 19 percent reported having a mental or intellectual disorder (MID) and 33 percent identified themselves as having a chronic condition.

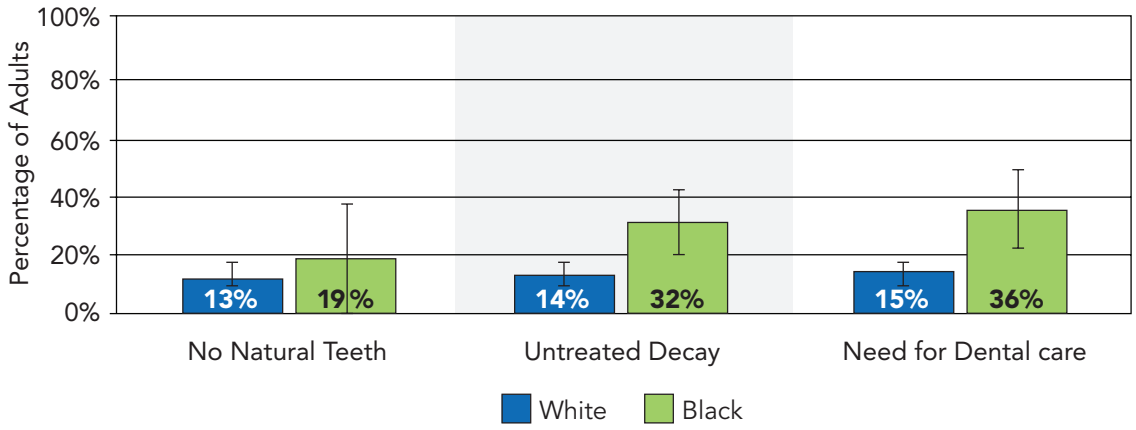
Basic Screening Survey (BSS)

Figure 1. Percentage of Wisconsin Adults with Screening Indicators, 2010-2011.



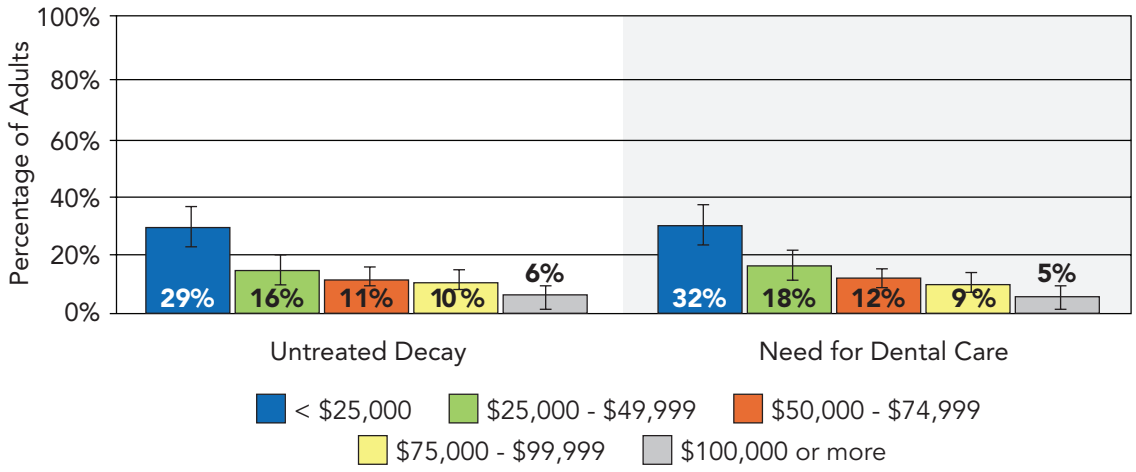
Among older adults (65 years and older), 13 percent lost all of their natural teeth. Among all adults screened, 15 percent had untreated decay and 16 percent needed dental care. Need for dental care meant that the adult had untreated decay, an abscess or a suspicious soft tissue lesion that required examination and treatment by a dentist. It is also important to note that the BSS protocol may underestimate disease since it is a visual screening for obvious issues, compared to a full dental exam, which can detect deeper, underlying problems.

Figure 2. Percentage of Wisconsin Adults with Screening Indicators by Race/Ethnicity, 2010-2011.



Race/ethnicity was associated with oral health, where black adults were found to have poorer oral health outcomes in all three screening indicators, compared to white adults. The prevalence of complete tooth loss was slightly higher for blacks (19 percent) than for whites (13 percent). Thirty-two percent of blacks had untreated decay, compared to 14 percent of whites. The need for dental care was also significantly higher for blacks (36 percent) than for whites (15 percent). Not enough data were available to make comparisons for Hispanic adults and adults of other racial/ethnic descent.

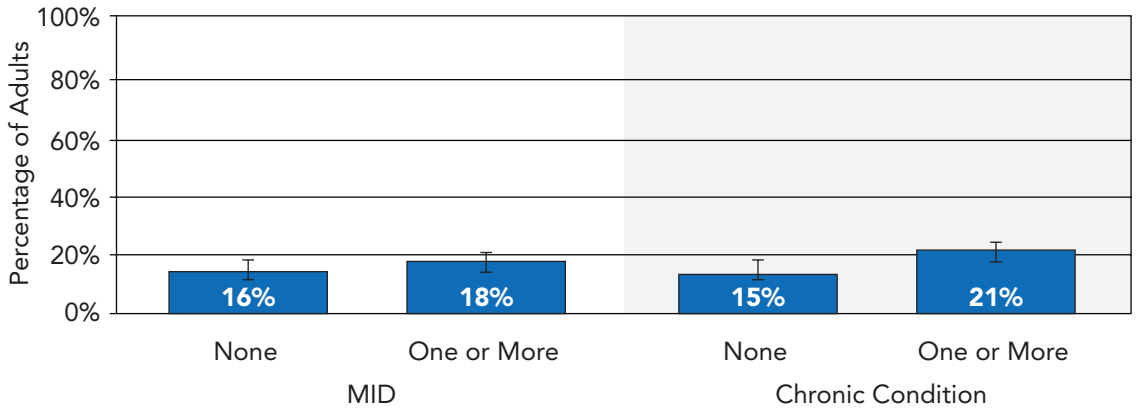
Figure 3. Percentage of Wisconsin Adults with Select Screening Indicators by Income, 2010-2011.



For Wisconsin adults, an inverse association was found between poor oral health outcomes and income. Adults in the lower income groups had a higher prevalence of untreated decay and need for dental care. Twenty-nine percent of adults with an income less than $25,000 had untreated decay, compared to 16 percent of adults in the next highest income group ($25,000-$49,999). The need for dental care was significantly higher for adults with an income less than $25,000 (32 percent) than for adults with an income of $25,000-$49,999 (18 percent). Not enough data were available to assess a possible association between income and loss of natural teeth.

Similar to income, adults with less education had a significantly higher prevalence of untreated decay and need for dental care (see Table 7). Thirty-nine percent of adults with an education level less than high school had untreated decay, compared to 20 percent of adults with a high school degree or equivalent. Need for dental care was significantly higher for adults with an education level less than high school (42 percent) than for adults with a high school degree or equivalent (21 percent). As expected, income and education acted in a similar manner since both have been known to be strongly related to socioeconomic status.

Figure 5. Percentage of Wisconsin Adults Needing Dental Care by Disability Status, 2010-2011.



In Wisconsin, adults with disabilities were slightly more likely to need dental care compared to adults without disabilities. The prevalence of untreated decay also followed a similar trend (see Table 8). Not enough data were available to make inferences between complete tooth loss and disability status.

Self-Reported Information

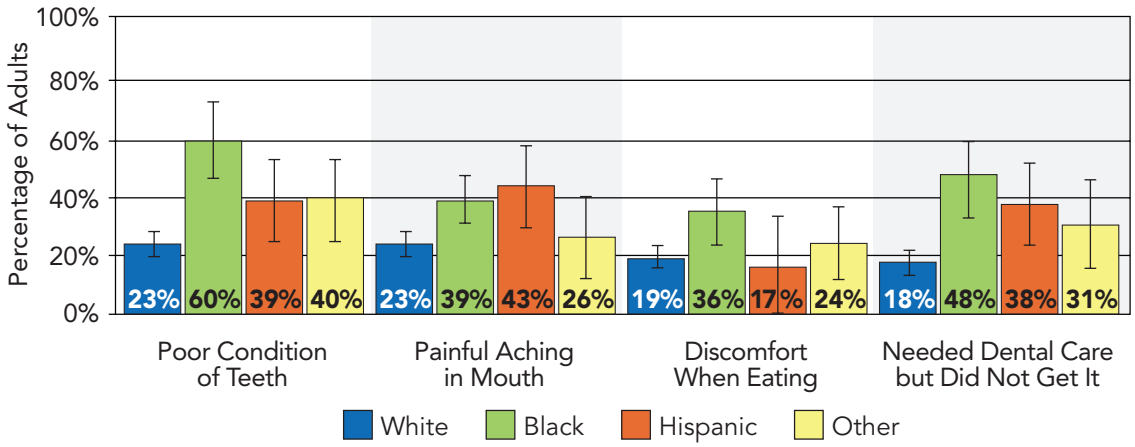
In general, one out of four adults in Wisconsin reported the condition of their teeth as poor. Similarly, about one out of four reported painful aching of the mouth, while one out of five adults reported discomfort when eating.

Among adults who reported that they lost at least one permanent adult tooth, the most common reasons provided were wisdom tooth extractions (36%), cavities (25%), overcrowding (17%), accidents (7%), and gum disease (4%).

Among adults who reported that they had ever had gum disease (17%), only half of them received treatment for it (8%) (See data tables, Table 9).

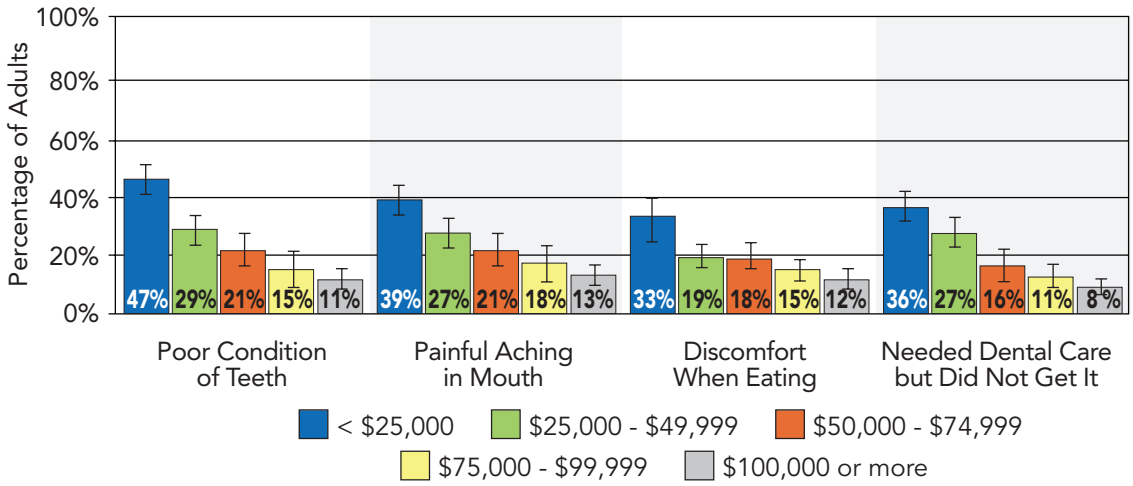
One out of five adults also reported that they needed dental care but did not get it. Among adults who reported that they needed dental care but did not get it, the most common reasons for not receiving care were an inability to afford the cost (68%), inadequate insurance coverage (26%), a lack of convenience in getting care (23%), and a fear or dislike of dentists (17%). When asked about the coverage of their preventive dental services through their medical insurance, 27 percent of adults responded that none of the costs were covered.

Figure 6. Percentage of Wisconsin Adults with Select Oral Health Problems by Race/Ethnicity, 2010-2011.



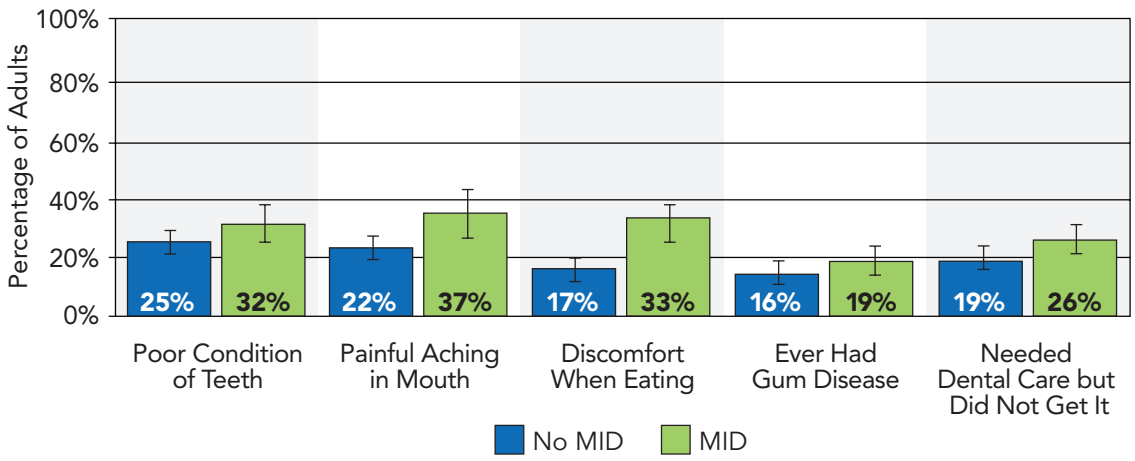
When looking at race/ethnicity, the prevalence of oral health problems was typically greater in adults of black, Hispanic, and other racial/ethnic descent than in white adults. Sixty percent of black adults and 40 percent of adults of other racial/ethnic descent reported having poor condition of teeth, compared to 23 percent of white adults. Blacks (39 percent) and Hispanics (43 percent) were also significantly more likely to report painful aching in the mouth than whites (23 percent). Discomfort when eating was significantly higher for blacks (36 percent) than for whites (19 percent). There was also a significant difference in access to dental care between whites and racial/ethnic minorities. Forty-eight percent of blacks and 38 percent of Hispanics reported needing dental care but not getting it, compared to 18 percent of whites.

Figure 7. Percentage of Wisconsin Adults with Select Oral Health Problems by Income, 2010-2011.



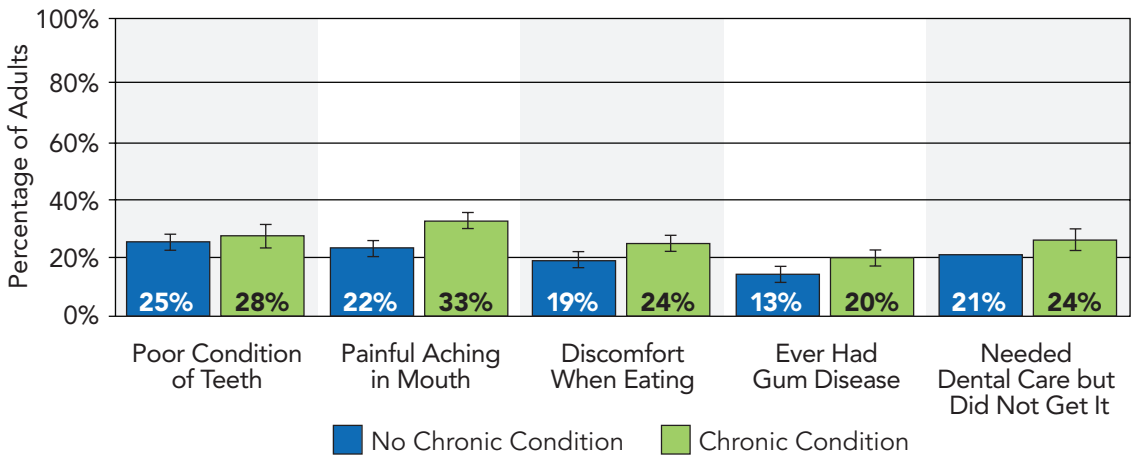
Another association between income and oral health could be seen in the self-reported data. The prevalence of oral health problems was greatest among the lowest income groups. Compared to the next highest income group ($25,000-$49,999), adults with income less than $25,000 were significantly more likely to have poor condition of teeth, painful aching in the mouth, and discomfort when eating. Thirty-six percent of adults with income less than $25,000 reported needing dental care but not getting it, compared to 8 percent of those in the highest income group ($100,000 or more).

Figure 8. Percentage of Wisconsin Adults with Select Oral Health Problems by Mental or Intellectual Disorder (MID) Status, 2010-2011.



Based on data availability, an adult with a mental or intellectual disorder (MID) was defined as one who had any of the following conditions: Alzheimer's disease, learning disability, mild cognitive impairment, post-traumatic stress disorder, anxiety, or autism spectrum disorder (Table 1). Wisconsin adults with an MID reported a higher prevalence of oral health issues than those without an MID. There was a significant difference in reporting painful aching in the mouth and discomfort when eating, with adults who had an MID experiencing those poor oral health outcomes more often. Thirty-seven percent of adults with an MID reported painful aching in the mouth, compared to 22 percent of adults without an MID. Discomfort when eating was significantly higher for adults with an MID (33 percent) than for adults without an MID (17 percent).

Figure 9. Percentage of Wisconsin Adults with Select Oral Health Problems by Chronic Condition Status, 2010-2011.



Based on data availability, an adult with a chronic condition was defined as one who had any of the following conditions: cancer, epilepsy, migraine headache, Parkinson's disease, rheumatoid arthritis, asthma, or diabetes (Table 1). Adults with a chronic condition were more likely to have poor oral health and more difficulty accessing dental care than those without a chronic condition. Painful aching in the mouth was significantly higher in adults with a chronic condition (33 percent) than in adults without a chronic condition (22 percent). Twenty percent of adults with a chronic condition reported ever having gum disease, compared to 13 percent of adults without a chronic condition. Gum disease and chronic diseases, particularly diabetes, have been found to be associated in previous studies (4). These findings stress the importance of good oral health and its relationship to overall health.

CONCLUSIONS

Overall, the prevalence of oral health problems or difficulty accessing dental care among adults aged 21 to 74 years appeared to be low in Wisconsin. However, there were also a few limitations to the Wisconsin screening data that should be mentioned. First, the BSS protocol used for the Wisconsin screening may underestimate disease because it only captures obvious problems that can be detected through visual inspection, compared to data collected from a comprehensive dental exam that can detect underlying issues not easily seen by the eye. Secondly, survey data from Wisconsin adults found that 26 percent of them reported that they had poor or fair oral health, which may also imply that the Wisconsin screening was missing part of the larger picture due to capturing only one point in time. Lastly, only health insurance information was available. Stratifying indicators by dental insurance could bring to light additional findings that could better inform policies and interventions.

Furthermore, disparities in oral health and access to dental services due to race/ethnicity, socioeconomic status, and disability status also represented key areas of concern for Wisconsin and target populations of programs and policies. In Wisconsin, oral health problems, such as untreated decay, were sometimes twice as prevalent among vulnerable populations.

To respond to these oral health issues and disparities, the Wisconsin Oral Health Program (OHP) has partnered with public and private organizations in recent years. With funding from the US Health Resources and Services Administration (HRSA) and the Centers for Disease Control and Prevention (CDC), the Wisconsin OHP has increased the reach of the Seal-a-Smile school-based dental sealant programs, further developed Wisconsin's ability to address community water fluoridation issues, and looked for innovative ways to bolster the monitoring and surveillance of oral health in Wisconsin. One such way was the partnership with SHOW in 2010 to develop the objective screening module on oral health. Additionally, the Wisconsin OHP has provided funding to a number of dental clinics to improve access to dental services for at-risk populations. A number of resources, including newsletters and a list of free or reduced fee dental clinics, have also been made available on the Wisconsin OHP website. The Wisconsin OHP along with partners will continue to identify opportunities to connect at-risk adults in Wisconsin with dental care.

DATA TABLES

Table 2 – Demographics of Adults

Variable	Percent or Mean (SHOW)	Percent or Mean (2010 BRFSS)
Age in Years:		
Mean (SE)	45.9 (0.06)	—
Sex:		
Male	49.9	49.3
Female	50.1	50.7
Race:		
White	86.9	88.9
Black	5.2	3.1
Hispanic	4.5	2.6
Other	3.4	5.5
Income:		
Less than $25,000	22.7	21.8
$25,000 to $49,999	25.4	32.8
$50,000 to $74,999	18.7	45.3†
$75,000 to $99,999	14.3	45.3†
$100,000 or more	19.0	45.3†
Education		
Less than high school	6.2	5.7
High school degree or equivalent	22.0	31.6
Some college	22.5	29.2*
Associates/Bachelor's degree or more	49.4	33.5
Disability		
MID	19.3	17.8#
Chronic Conditions	33.0	17.8#

Abbreviations: SHOW, Survey of the Health of Wisconsin; BRFSS, Behavior Risk Factor Surveillance System; SE, standard error; MID, mental and intellectual disorders.

† The 2010 BRFSS online query system only provided data for income as the following categories: less than $25,000, $25,000-$49,999, and $50,000 or more.

*Some college was defined as some college or technical school.

#Disability was more narrowly defined as adults who were limited in any activities because of physical, mental, or emotional problems.

The link to this query system can be found here: http://apps.nccd.cdc.gov/brfss/page.asp?cat=DL&yr=2010&qkey=4000&state=WI#DL

Table 3 – Screening Indicators of Adults

Variable	% (95% CI) N=1495
No natural teeth	13.1 (8.4 – 17.9)
Untreated decay	15.1 (12.7 – 17.6)
Need for dental care	16.2 (13.6 – 18.8)

Table 4 – Screening Indicators Stratified By Gender of Adults

Variable	Male % (95% CI) N=647	Female % (95% CI) N=848
No natural teeth	14.3 (4.1 – 6.2)	11.9 (2.7 – 6.5)
Untreated decay	16.0 (12.5 – 19.5)	14.3 (11.7 – 16.8)
Need for dental care	16.3 (12.8 – 19.7)	16.1 (13.1 – 19.2)

Table 5 – Screening Indicators Stratified By Race/Ethnicity of Adults

Variable	White % (95% CI) (n=1350)	Black % (95% CI) (n=54)	Hispanic % (95% CI) (n=47)	Other % (95% CI) (n=42)
No natural teeth	13.3 (8.4 – 18.3)	18.6* (0.2 – 37.1)	0	0
Untreated decay	14.0 (11.6 – 16.5)	31.6 (19.2 – 44.0)	15.0* (0.6 – 29.3)	19.1* (6.5 – 31.7)
Need for dental care	14.9 (12.3 – 17.4)	36.4 (24.5 – 48.2)	14.6* (0.3 – 28.8)	22.7* (9.0 – 36.4)

Date Notes: An asterisk (*) indicates an estimate with a relative standard error greater than 30 percent but less than 50 percent and should be used with caution since it does not meet standards of reliability or precision.

Table 6 – Screening Indicators Stratified By Income of Adults

Variable	Less than $25,000 % (95% CI) (n=317)	$25,000 – $49,999 % (95% CI) (n=373)	$50,000 – $74,999 % (95% CI) (n=281)	$75,000 – $99,999 % (95% CI) (n=211)	$100,000 or more % (95% CI) (n=254)
Untreated decay	28.5 (22.1 – 34.8)	16.2 (11.9 – 20.5)	11.0 (6.8 – 15.1)	9.5 (4.7 – 14.4)	5.7* (1.9 – 9.5)
Need for dental care	31.6 (24.9 – 38.2)	17.7 (13.1 – 22.3)	11.8 (7.6 – 15.9)	9.0 (4.3 – 13.8)	5.4* (1.9 – 9.0)

Date Notes: The indicator "No Natural Teeth" is not shown due to numbers being too small.

An asterisk (*) indicates an estimate with a relative standard error greater than 30 percent but less than 50 percent and should be used with caution since it does not meet standards of reliability or precision.

Table 7 – Screening Indicators Stratified By Education of Adults

Variable	Less than high school % (95% CI) (n=1350)	High school graduate % (95% CI) (n=54)	Some college % (95% CI) (n=47)	Associate/ Bachelor's Degree or more % (95% CI) (n=42)
No natural teeth	24.0* (5.7 – 42.3)	24.1 (12.7 – 35.5)	§	4.0* (1.5 – 6.6)
Untreated decay	39.3 (28.0 – 50.6)	20.2 (15.2 – 25.2)	15.6 (10.9 – 20.4)	9.6 (6.7 – 12.5)
Need for dental care	42.2 (30.8 – 53.5)	21.2 (15.8 – 26.7)	18.5 (13.5 – 23.5)	9.6 (7.0 – 12.1)

Date Notes: An asterisk (*) indicates an estimate with a relative standard error greater than 30 percent but less than 50 percent and should be used with caution since it does not meet standards of reliability or precision. A section sign symbol (§) indicates an estimate that is not shown due to a relative standard error greater than 50 percent.

Table 8 – Screening Indicators Stratified By Disability Status of Adults

Variable	No MID % (95% CI) (n=1206)	MID % (95% CI) (n=289)	No chronic condition % (95% CI) (n=836)	Chronic condition % (95% CI) (n=455)
No natural teeth	13.5 (8.1 – 19.0)	§	No data available	No data available
Untreated decay	14.9 (12.2 – 17.7)	15.9 (11.2 – 20.6)	14.4 (11.0 – 17.9)	18.8 (15.1 – 22.5)
Need for dental care	15.7 (13.0 – 18.5)	18.1 (13.1 – 23.2)	14.8 (11.5 – 18.0)	21.4 (17.3 – 25.6)

Abbreviations: MID, mental and intellectual disorders.

Date Notes: A section sign symbol (§) indicates an estimate that is not shown due to a relative standard error greater than 50 percent.

Table 9 – Self-Reported Oral Health of Adults

Variable	% (95% CI)
Poor condition of teeth (Poor or fair)	26.0 (23.3 – 28.7)
Painful aching in mouth (Very often, faily often, or occasionally)	25.0 (22.3 – 27.5)
Less satisfied due to tooth or mouth problems (Very often, faily often, or occasionally)	9.3 (7.6 – 11.0)
Difficulty doing usual job due to tooth or mouth problems (Very often, faily often, or occasionally)	2.7 (1.8 – 3.5)
Discomfort when eating (Very often, faily often, or occasionally)	20.0 (17.6 – 22.3)
Lost any permanent teeth Yes, but only my wisdom teeth Yes, other teeth beside or in addition to wisdom teeth No	 39.8 (36.7 – 43.0) 46.2 (43.1 – 49.3) 13.9 (11.7 – 16.1)
Reason for losing teeth Cavities Gum disease Accident Wisdom tooth pulled Overcrowding Other	 25.1 (22.2 – 28.0) 3.5 (2.6 – 4.4) 6.6 (4.9 – 8.3) 36.3 (32.9 – 39.6) 16.6 (14.3 – 19.0) 12.8 (11.0 – 14.7)
Ever had gum disease	16.5 (14.2 – 18.8)
No treatment for gum disease	8.3 (6.6 – 10.1)
Frequent cleanings for gum disease (by dental hygienist)	4.4 (3.4 – 5.4)
Surgery for gum disease	3.1 (2.2 – 4.1)
Other treatment for gum disease	3.8 (2.7 – 4.9)
Needed dental care, but did not get it	20.7 (18.3 – 23.0)
Reasons for not getting dental care: Could not afford cost Inadequate insurance cost Convenience of getting care Afraid or did not like dentists Other	 67.8 (61.1 – 74.4) 26.0 (19.8 – 32.3) 22.9 (18.1 – 27.8) 17.0 (12.7 – 21.3) 17.9 (12.5 – 23.4)
Preventive dental services not covered by health plan	26.9 (24.1 – 29.6)
Reason preventive dental services not covered: Had a separate dental plan No dental coverage at all	 47.3 (41.7 – 53.0) 52.7 (47.0 – 58.3)

Table 10 – Self-Reported Health Behaviors of Adults

Variable	% (98% CI)
One year since last dental check-up:	75.2 (72.1 – 78.3)
Daily frequency of tooth brushing:	84.6 (82.2 – 87.0)
Daily frequency of flossing:	21.7 (19.2 – 24.2)
Brushing teeth two or more times in one day:	60.2 (56.5 – 63.9)
Heavy drinking:	14.1 (11.3 – 17.0)
At least one day of binge-drinking this past year:	14.7 (12.5 – 16.8)
Smoking:	
Current	21.4 (18.5 – 24.2)
Former	27.5 (25.0 – 29.9)
Never	51.2 (47.9 – 54.5)

Data Notes: Heavy drinking was defined as having 14 drinks or more per week for males and as having 7 drinks or more per week for females.

Table 11 – Select Oral Health Indicators Stratified By Race/Ethnicity of Adults

Variable	White % (95% CI) (n=1,350)	Black % (95% CI) (n=54)	Hispanic % (95% CI) (n=47)	Other % (95% CI) (n=42)
Poor condition of teeth (Poor or fair)	22.7 (20.1 – 25.4)	60.3 (47.8 – 72.9)	38.6 (24.3 – 52.9)	40.2 (25.8 – 54.5)
Painful aching in mouth (Very often, fairly often, or occasionally)	23.1 (20.4 – 25.8)	38.9 (31.1 – 46.7)	43.4 (27.5 – 59.3)	26.4* (9.9 – 43.0)
Discomfort when eating (Very often, fairly often, or occasionally)	19.1 (16.7 – 21.4)	35.5 (23.9 – 47.1)	17.1* (1.7 – 32.6)	23.9 (10.3 – 37.5)
Ever had gum disease	16.5 (14.2 – 18.7)	17.6 (7.9 – 27.3)	13.2* (4.0 – 22.4)	20.0 (9.7 – 30.3)
Needed dental care but did not get it	17.8 (15.2 – 20.3)	48.3 (35.1 – 61.5)	37.5 (23.1 – 52.0)	30.9 (12.6 – 49.3)
Did not have a dental check up in the last year	23.0 (19.6 – 26.4)	36.3 (26.3 – 46.3)	41.6 (26.4 – 56.8)	36.2 (20.2 – 52.2)
Costs of preventive dental services not covered by health plan	26.8 (24.2 – 29.4)	36.4 (17.8 – 55.0)	13.2* (1.1 – 25.3)	32.9 (16.1 – 49.8)
Reason preventive dental services not covered				
Had a separate dental plan	45.9 (40.1 – 51.7)	49.3* (11.8 – 86.8)	71.3 (36.9 – 100.0)	58.9 (26.5 – 91.3)
No dental coverage at all	54.1 (48.3 – 59.9)	50.7* (13.2 – 88.2)	§	41.1* (8.7 – 73.5)

Date Notes: An asterisk (*) indicates an estimate with a relative standard error greater than 30 percent but less than 50 percent and should be used with caution since it does not meet standards of reliability or precision. A section sign symbol (§) indicates an estimate that is not shown due to a relative standard error greater than 50 percent.

Table 12 – Select Oral Health Indicators Stratified By Income of Adults

Variable	Less than $25,000 % (95% CI) (n=317)	$25,000 – $49,999 % (95% CI) (n=373)	$50,000 – $74,999 % (95% CI) (n=281)	$75,000 – $99,999 % (95% CI) (n=211)	$100,000 or more % (95% CI) (n=254)
Poor condition of teeth (Poor or fair)	46.9 (40.5 – 53.3)	28.9 (24.5 – 33.2)	21.0 (15.6 – 26.4)	15.2 (9.3 – 21.2)	10.9 (6.8 – 14.9)
Painful aching in mouth (Very often, fairly often, or occasionally)	39.1 (33.7 – 44.6)	27.2 (21.4 – 33.0)	21.0 (16.0 – 26.1)	17.9 (12.6 – 23.2)	13.3 (9.2 – 17.4)
Discomfort when eating (Very often, fairly often, or occasionally)	33.3 (26.7 – 39.9)	18.7 (14.0 – 23.3)	17.5 (12.9 – 22.1)	14.6 (10.2 – 19.0)	11.5 (6.6 – 16.3)
Ever had gum disease	18.2 (13.0 – 23.4)	16.3 (12.1 – 20.5)	15.4 (10.6 – 20.3)	20.9 (15.2 – 26.7)	11.0 (6.7 – 15.2)
No treatment for gum disease	8.1 (4.8– 11.4)	7.6 (4.5 – 10.7)	6.1 (3.2 – 9.1)	12.1 (7.5 – 16.7)	7.0 (3.4 – 10.6)
Needed dental care but did not get it	35.9 (30.0 – 41.8)	27.1 (21.9 – 32.4)	15.8 (10.2 – 21.4)	10.9 (6.9 – 14.9)	7.7 (4.3 – 11.1)
Did not have dental check-up in the last year	44.8 (38.8 – 50.8)	34.8 (28.6 – 41.0)	18.1 (12.4 – 23.9)	11.0 (6.3 – 15.7)	9.1 (5.5 – 12.7)
Cost of preventive dental services not covered by health plan	36.9 (30.1 – 43.7)	38.4 (32.2 – 44.6)	22.8 (17.9 – 27.6)	20.5 (14.1 – 26.8)	13.6 (8.5 – 18.8)
Reason preventive dental services not covered					
Had a separate dental plan	38.8 (24.3 – 53.3)	36.4 (26.9 – 45.8)	53.0 (40.0 – 66.0)	65.3 (50.3 – 80.3)	63.1 (48.0 – 78.1)
No dental coverage at all	61.2 (46.7 – 75.7)	63.6 (54.2 – 73.1)	47.0 (34.0 – 60.0)	34.7 (19.7 – 49.7)	36.9 (21.9 – 52.0)

Date Notes: The indicator "No Natural Teeth" is not shown due to numbers being too small.

An asterisk (*) indicates an estimate with a relative standard error greater than 30 percent but less than 50 percent and should be used with caution since it does not meet standards of reliability or precision. A section sign symbol (§) indicates an estimate that is not shown due to a relative standard error greater than 50 percent.

Table 13 – Select Oral Health Indicators Stratified By Disability Status of Adults

Variable	No MID % (95% CI) (n=1,206)	MID % (95% CI) (n=289)	No Chronic Condition % (95% CI) (n=836)	Chronic Condition % (95% CI) (n=455)
Poor condition of teeth (Poor or fair)	24.6 (21.7 – 27.5)	31.7 (25.2 – 38.2)	25.4 (22.1 – 28.7)	27.6 (22.5 – 32.8)
Painful aching in mouth (Very often, fairly often, or occasionally)	22.1 (19.1 – 25.0)	36.9 (30.6 – 43.3)	22.4 (19.1 – 25.7)	33.1 (29.0 – 37.2)
Discomfort when eating (Very often, fairly often, or occasionally)	17.0 (14.5 – 19.4)	32.5 (27.3 – 37.8)	18.6 (15.2 – 22.1)	24.2 (19.9 – 28.5)
Ever had gum disease	15.9 (13.5 – 18.4)	18.8 (13.8 – 23.7)	12.7 (10.2 – 15.2)	19.9 (15.7 – 24.2)
Needed dental care but did not get it	19.4 (16.6 – 22.1)	26.1 (21.4 – 30.9)	20.8 (17.4 – 24.2)	23.5 (18.7 – 28.3)
Did not have a dental check up in the last year	23.5 (20.3 – 26.8)	30.1 (24.1 – 36.1)	23.7 (19.7 – 27.6)	27.2 (22.1 – 32.3)
Costs of preventive dental services not covered by health plan	26.7 (23.5 – 29.9	27.5 (22.2 – 32.7)	18.8 (15.7 – 21.9)	25.9 (20.9 – 31.0)
Reason preventive dental services not covered				
Had a separate dental plan	47.6 (41.2 – 53.9)	46.5 (34.0 – 59.0)	57.2 (48.0 – 66.4)	49.4 (39.9 – 58.9)
No dental coverage at all	52.4 (46.1 – 58.8)	53.5 (41.0 – 66.0)	42.8 (33.6 – 52.0)	50.6 (41.1 – 60.1)

Table 14 – Odds Ratios for Untreated Decay (Screening Indicator)

Variable	Bi-Variable Models		Multi-Variable Models	
	Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Sex				
Female	Reference		Reference	
Male	1.14 (0.87 – 1.50)	0.3336	1.14 (0.82 – 1.60)	0.4399
Race/Ethnicity				
White	Reference		Reference	
Black	2.83 (1.52 – 5.26)	0.001	1.64 (0.73 – 3.67)	0.2308
Hispanic	1.08 (0.35 – 3.33)	0.8963	0.54 (0.15 – 1.94)	0.3442
Other	1.45 (0.65 – 3.20)	0.3622	1.41 (0.54 – 3.68)	0.4864
Income				
$100,000 or more	Reference		Reference	
$75,000 – $99,999	1.76 (0.80 – 3.88)	0.1616	1.88 (0.82 – 4.33)	0.1367
$50,000 – $74,999	2.06 (0.93 – 4.53)	0.0737	1.76 (0.78 – 3.96)	0.1737
$25,000 – $49,999	3.22 (1.49 – 6.96)	0.0030	2.60 (1.10 – 6.11)	0.0295
Less than $25,000	6.64 (3.08 – 14.29)	< .0001	4.43 (1.95 – 10.07)	0.0004
Education				
Associate's/Bachelor's Degree or more	Reference		Reference	
Some college	1.75 (1.07 – 2.84)	0.0251	1.42 (0.85 – 2.39)	0.1849
High school graduate	2.38 (1.56 – 3.63)	< .0001	1.75 (1.07 – 2.85)	0.0256
Less than high school	6.09 (3.49 – 10.63)	< .0001	3.49 (1.73 – 7.05)	0.0005
Smoking				
Never	Reference		Reference	
Former	1.31 (0.92 – 1.87)	0.1326	1.28 (0.86 – 1.90)	0.2251
Current	3.83 (2.64 – 5.54)	< .0001	2.91 (1.91 – 4.43)	< .0001
Heaving Drinking				
No	Reference		Reference	
Yes	0.94 (0.57 – 1.57)	0.8224	0.76 (0.42 – 1.35)	0.3456
MID				
No	Reference		Reference	
Yes	1.08 (0.73 – 1.58)	0.7068	0.62 (0.40 – 0.97)	0.0345
Chronic Condition				
No	Reference		Reference	
Yes	1.37(0.97 – 1.95)	0.0754	1.44 (0.96 – 2.16)	0.0750

Date Notes: Adjusted for sex, race/ethnicity, income, education, smoking, and heavy drinking in the multivariate analyses.

Note: Tables 14 and 15 include odds ratios for two screening indicators, untreated decay and a need for dental care, among Wisconsin adults. Odds ratios are ratios of the probability that an event will occur versus the probability that the event will not occur. For this report's purpose, the event is untreated decay or a need for dental care. Odds ratios statistics show that the characteristics of household income less than $50,000, an education level of a high school graduate or less, current smoking status, and a chronic condition have the highest odds of adults having untreated decay or a need for dental care.

Table 15 – Odds Ratios for Need for Dental Care (Screening Indicator)

Variable	Bi-Variable Models		Multi-Variable Models	
	Odds Ratio (95% CI)	P-value	Odds Ratio (95% CI)	P-value
Sex				
Female	Reference		Reference	
Male	1.01 (0.76 – 1.35)	0.3336	0.98 (0.68 – 1.41)	0.9044
Race/Ethnicity				
White	Reference		Reference	
Black	3.27 (1.85 – 5.80)	< .0001	1.60 (0.70 – 3.65)	0.2670
Hispanic	0.98 (0.31 – 3.03)	0.9658	0.47 (0.13 – 1.71)	0.2490
Other	1.68 (0.77 – 3.68)	0.1918	1.77 (0.68 – 4.60)	0.2395
Income				
$100,000 or more	Reference		Reference	
$75,000 – $99,999	1.73 (0.75 – 4.02)	0.2018	1.86 (0.77 – 4.47)	0.1661
$50,000 – $74,999	2.33 (1.10 – 4.93)	0.0278	1.99 (0.92 – 4.33)	0.0814
$25,000 – $49,999	3.74 (1.82 – 7.71)	0.0003	2.87 (1.30 – 6.33)	0.0089
Less than $25,000	8.04 (3.93 – 16.43)	< .0001	5.25 (2.50 – 11.05)	< .0001
Education				
Associate's/Bachelor's Degree or more	Reference		Reference	
Some college	2.14 (1.37 – 3.35)	0.0008	1.68 (1.03 – 2.76)	0.0380
High school graduate	2.55 (1.74 – 3.72)	< .0001	1.89 (1.23 – 2.91)	0.0035
Less than high school	6.90 (4.08 – 11.67)	< .0001	3.64 (1.81 – 7.30)	0.0003
Smoking				
Never	Reference		Reference	
Former	1.28 (0.91 – 1.78)	0.1542	1.23 (0.83 – 1.83)	0.2968
Current	3.78 (2.73 – 5.25)	< .0001	2.83 (1.89 – 4.24)	< .0001
Heaving Drinking				
No	Reference		Reference	
Yes	0.85 (0.53 – 1.38)	0.5167	0.70 (0.40 – 1.23)	0.2132
MID				
No	Reference		Reference	
Yes	1.18 (0.82 – 1.71)	0.3673	0.72 (0.48 – 1.08)	0.1080
Chronic Condition				
No	Reference		Reference	
Yes	1.58 (1.14 – 2.17)	0.0055	1.54 (1.08 – 2.22)	0.0187

Date Notes: Adjusted for sex, race/ethnicity, income, education, smoking, and heavy drinking in the multivariate analyses.

Note: Tables 14 and 15 include odds ratios for two screening indicators, untreated decay and a need for dental care, among Wisconsin adults. Odds ratios are ratios of the probability that an event will occur versus the probability that the event will not occur. For this report's purpose, the event is untreated decay or a need for dental care. Odds ratios statistics show that the characteristics of household income less than $50,000, an education level of a high school graduate or less, current smoking status, and a chronic condition have the highest odds of adults having untreated decay or a need for dental care.

REFERENCES

1 Adult Oral Health. Atlanta, GA, Centers for Disease Control and Prevention (CDC), July 10, 2013. (http://www.cdc.gov/oralhealth/children_adults/adults.htm).

2. Fact Sheets: Oral Health for Adults. Atlanta, GA, Centers for Disease Control and Prevention (CDC), July 10, 2013. (http://www.cdc.gov/oralhealth/publications/factsheets/adult_oral_health/adults.htm).

3. Benjamin RM. Oral health: the silent epidemic. Public Health Rep. 2010; 125(2):158-9.

4. US Department of Health and Human Services. Oral health in America: a report of the Surgeon General. Rockville, MD: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health. 2000;63:74-94.

5. Paju S, Scannapieco F. Oral biofilms, periodontitis, and pulmonary infections. Oral Dis. 2007;13(6):508-12.

6. Disparities in Oral Health. Atlanta, GA, Centers for Disease Control and Prevention, March 20, 2015. (http://www.cdc.gov/oralhealth/oral_health_disparities/index.htm).

7. Olson M, LeMay W. The Burden of Oral Disease in Wisconsin. Wisconsin Oral Health Program, Wisconsin Department of Health Services, 2010.

8. Nieto FJ, Peppard PE, Engelman CD, et al. The Survey of the Health of Wisconsin (SHOW), a novel infrastructure for population health research: rationale and methods. BMC Public Health. 2010;10:785,2458-10-785. (doi: 10.1186/1471-2458-10-785 [doi]).

9. Basic Screening Surveys: An Approach to Monitoring Community Oral Health. Columbus, OH, Association of State and Territorial Dental Directors, 1999, revised September 2003.

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