

Running the Numbers

*A Periodic Feature to Inform North Carolina Health Care Professionals
About Current Topics in Health Statistics*

Oral Health Trends from the North Carolina Behavioral Risk Factor Surveillance System, 2012–2016

The Behavioral Risk Factor Surveillance System (BRFSS) is a health-related telephone survey conducted in all 50 states, the District of Columbia, and several US territories. Adults aged 18 years and older in households with telephones are contacted via random-digit dialing, and interviewers use a computer-assisted, telephone-interviewing system to conduct the survey. North Carolina has participated in the BRFSS since 1987. In 2011, a new weighting methodology—raking, or iterative proportional fitting—was implemented, along with the addition of cell phone interviews, in order to reduce the bias in BRFSS estimates and improve the generalizability of the results to the statewide population. Due to these changes, BRFSS results from 2011 and later are not comparable with earlier years [1].

In even-numbered years, the core BRFSS questionnaire contains a module on Oral Health (see Figure 1). These Oral Health survey questions are asked biannually, and no changes are made to questions between survey years.

FIGURE 1.
BRFSS Oral Health Module Questions

Question 1) How long has it been since you last visited a dentist or a dental clinic for any reason? Include visits to dental specialists, such as orthodontists.

Instruction for interviewer: Read only if necessary:

1. Within the past year (anytime less than 12 months ago)
2. Within the past 2 years (1 year but less than 2 years ago)
3. Within the past 5 years (2 years but less than 5 years ago)
4. 5 or more years ago

Question 2) How many of your permanent teeth have been removed because of tooth decay or gum disease? Include teeth lost to infection, but do not include teeth lost for other reasons, such as injury or orthodontics.

NOTE: If wisdom teeth are removed because of tooth decay or gum disease, they should be included in the count for lost teeth.

Dental Visits

The BRFSS Oral Health module begins with a question regarding dental visits. Results for North Carolina are presented as the calculated variable “Adults with a Dentist or Dental Clinic Visit within the Past Year for Any Reason” in Table 1. In 2016, 63.6% of adults visited a dentist or dental clinic within the past year for any reason, which is not statistically different from the 2012 and 2014 results. Variation among selected sociodemographic groups does exist. In 2016, for those with less than a high school education, only 34.8% visited a dentist or dental clinic within the past year, while 82.2% of college graduates had a visit in the past year. A similar trend is seen in household income, where 40.2% of adults in a household with less than \$15,000 annual income had a visit within the past year, and 83.2% of adults in a household with \$75,000 or higher annual income had a visit within the past year.

Continuing to look at the 2016 survey results, another category with significant differences is those identified with a disability. Of adults with a disability, 53.3% had a visit within the past year, while 66.1% of adults without a disability had a visit within the past year. Veterans had a higher visit percentage, with 71.7% of veterans having a visit within the past year, while 62.5% of non-veterans had a visit within the past year.

Meanwhile, the most recent national data on adults with a visit to a dentist or dental clinic within

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TABLE 1.
Trends in Adults with a Dentist or Dental Clinic Visit Within the Past Year for Any Reason by Sociodemographic Groups in North Carolina, 2012-2016

Demographics	2012 percent (95% CI)	2014	2016
Total	64.9 (63.8-66.0)	64.2 (62.8-65.5)	63.6 (62.2-65.1)
Gender			
Male	61.2 (59.3-63.0)	61.6 (59.5-63.6)	60.2 (58.0-62.4)
Female	68.4 (67.0-69.8)	66.5 (64.8-68.3)	66.8 (64.8-68.7)
Race/ethnicity			
Non-Hispanic white	69.1 (67.8-70.4)	69.3 (67.7-70.9)	67.9 (66.2-69.7)
Non-Hispanic black	56.5 (53.7-59.2)	55.2 (52.0-58.3)	55.4 (51.9-58.7)
Non-Hispanic Am Indian	54.0 (46.6-61.3)	***	***
Non-Hispanic other	69.1 (61.8-75.5)	64.3 (56.3-71.6)	63.0 (54.4-70.8)
Hispanic	50.9 (46.4-55.5)	43.0 (38.1-48.0)	48.8 (43.5-54.1)
Age			
18-34	63.7 (61.2-66.2)	60.8 (57.7-63.8)	61.6 (58.4-64.7)
35-44	65.4 (62.5-68.1)	64.3 (60.8-67.7)	62.8 (58.9-66.6)
45-54	65.6 (63.0-68.2)	68.1 (64.9-71.1)	65.7 (62.3-69.0)
55-64	66.7 (64.2-69.1)	66.4 (63.6-69.0)	66.6 (63.2-69.8)
65-74	66.4 (63.7-68.9)	63.7 (60.6-66.7)	66.1 (62.7-69.4)
75+	60.2 (56.8-63.4)	62.9 (59.2-66.5)	58.5 (53.8-63.0)
Education			
Less than high school	40.3 (37.0-43.8)	38.0 (34.1-41.9)	34.8 (30.5-39.2)
High school or GED	59.1 (56.9-61.3)	58.5 (55.8-61.1)	57.2 (54.3-59.9)
Some post-high school	69.4 (67.4-71.4)	69.2 (66.7-71.6)	67.2 (64.6-69.8)
College graduate	81.8 (80.1-83.3)	80.9 (79.0-82.7)	82.2 (80.3-84.0)
Household income			
Less than \$15,000	43.8 (40.4-47.3)	41.4 (37.4-45.6)	40.2 (35.5-45.1)
\$15,000-24,999	46.3 (43.4-49.2)	46.4 (42.9-49.9)	47.8 (44.0-51.6)
\$25,000-34,999	60.2 (56.5-63.7)	62.3 (57.9-66.6)	56.0 (51.0-60.8)
\$35,000-49,999	70.1 (66.9-73.1)	67.3 (63.2-71.1)	66.5 (62.2-70.6)
\$50,000-74,999	77.6 (74.7-80.3)	71.1 (67.0-74.9)	69.5 (65.4-73.3)
\$75,000+	85.9 (83.7-87.7)	86.2 (83.8-88.3)	83.2 (80.7-85.5)
Disability status			
Yes	56.2 (53.8-58.5)	55.9 (53.1-58.7)	53.3 (50.1-56.4)
No	67.4 (66.1-68.7)	67.1 (65.5-68.7)	66.1 (64.2-67.8)
Veteran status			
Veteran	69.1 (66.2-71.9)	69.3 (65.7-72.7)	71.7 (68.2-75.0)
Non-veteran	64.3 (63.1-65.5)	63.4 (61.9-64.8)	62.5 (60.9-64.1)

Note. CI, confidence interval.

***The estimate was suppressed because it did not meet statistical reliability standards.

the past year for any reason is for 2014, when the median response for all states, DC, and territories was 65.3%, with a range from 54% in Guam to 74.9% in Connecticut [2].

Teeth Removed

The second BRFSS Oral Health module question results for North Carolina are presented in Table 2 as "Adults That Have Not Had Any Permanent Teeth Extracted." No statistical dif-

ference exists among the 2016 result of 52.4% of adults who did not have permanent teeth extracted because of tooth decay or gum disease in comparison to results from 2012 and 2014.

The most striking variation in percentages of adults who have not had permanent teeth removed is the breakdown by age group. In 2016, 78.5% of adults in North Carolina aged 18-34 years old have not had permanent teeth removed, while only 19.0% of adults 75 years old and older have not had

TABLE 2.
Trends in Adults That Have Not Had Any Permanent Teeth Extracted by Sociodemographic Groups in North Carolina, 2012–2016

Demographics	2012 percent (95% CI)	2014	2016
Total	51.7 (50.5-52.9)	50.9 (49.5-52.3)	52.4 (50.9-53.9)
Gender			
Male	51.5 (49.6-53.3)	52.0 (49.9-54.1)	52.5 (50.3-54.6)
Female	51.9 (50.4-53.4)	49.8 (48.0-51.7)	52.3 (50.3-54.4)
Race/ethnicity			
Non-Hispanic white	54.7 (53.3-56.1)	53.1 (51.4-54.8)	54.5 (52.7-56.4)
Non-Hispanic black	40.8 (38.0-43.6)	41.5 (38.3-44.8)	41.4 (38.1-44.9)
Non-Hispanic Am Indian	31.7 (25.0-39.4)	***	***
Non-Hispanic other	64.0 (56.6-70.8)	61.9 (53.9-69.3)	65.7 (57.5-73.0)
Hispanic	52.5 (47.8-57.0)	53.4 (48.3-58.3)	56.4 (51.1-61.5)
Age			
18-34	77.1 (74.8-79.2)	77.6 (74.9-80.1)	78.5 (75.7-81.0)
35-44	61.5 (58.6-64.2)	55.0 (51.4-58.6)	60.9 (57.0-64.7)
45-54	45.0 (42.3-47.7)	49.4 (46.0-52.8)	46.7 (43.2-50.3)
55-64	34.0 (31.6-36.5)	33.2 (30.6-36.0)	36.7 (33.5-40.1)
65-74	24.8 (22.5-27.2)	24.2 (21.8-26.8)	27.8 (24.8-31.0)
75+	18.1 (15.9-20.5)	17.9 (15.3-20.8)	19.0 (15.8-22.8)
Education			
Less than high school	29.3 (26.1-32.7)	28.9 (25.3-32.8)	26.2 (22.3-30.6)
High school or GED	46.0 (43.7-48.2)	44.8 (42.1-47.5)	41.9 (39.1-44.8)
Some post-high school	54.7 (52.5-56.8)	53.2 (50.6-55.8)	58.0 (55.3-60.6)
College graduate	69.1 (67.3-70.9)	69.1 (67.0-71.1)	71.2 (69.0-73.4)
Household income			
Less than \$15,000	37.2 (33.7-40.7)	38.5 (34.5-42.7)	34.9 (30.2-40.0)
\$15,000-24,999	39.5 (36.7-42.4)	38.4 (34.9-41.9)	39.5 (35.8-43.4)
\$25,000-34,999	43.6 (39.9-47.4)	42.8 (38.4-47.5)	46.8 (41.9-51.7)
\$35,000-49,999	49.6 (46.3-53.0)	49.2 (45.0-53.3)	50.5 (46.1-54.8)
\$50,000-74,999	59.2 (55.9-62.4)	58.8 (54.7-62.9)	55.4 (51.2-59.4)
\$75,000+	70.3 (67.8-72.6)	69.5 (66.7-72.2)	70.0 (67.2-72.7)
Disability status			
Yes	31.4 (29.2-33.7)	27.8 (25.3-30.4)	28.8 (26.0-31.8)
No	57.4 (56.1-58.8)	57.6 (55.9-59.2)	56.3 (54.4-58.1)
Veteran status			
Veteran	42.6 (39.5-45.7)	44.5 (40.7-48.4)	45.6 (41.7-49.5)
Non-veteran	52.9 (51.7-54.2)	51.8 (50.3-53.3)	53.3 (51.7-54.9)

Note. CI, confidence interval.

***The estimate was suppressed because it did not meet statistical reliability standards.

permanent teeth removed. Statistically significant differences are also observed in education level and household income, with increasing percentages of adults with no permanent teeth removed with increased education level as well as with increased household income.

Regarding veteran status, 45.6% of veterans have had no permanent teeth removed, while 53.3% of non-veterans have not had permanent teeth removed. An examination of the veteran

population shows that a third of the survey respondents who are veterans are 65 years old or older, while in the non-veteran response group only 17.5% are 65 years old or older. Another statistically significant difference exists based on disability status, with 28.8% of adults with a disability having had no permanent teeth removed. Of those without a disability, 56.3% have not had permanent teeth removed.

Nationally, the median response for all states,

DC, and territories in 2014 showed that 56.4% of adults had not had permanent teeth removed for tooth decay or gum disease. The range for percent of adults with no permanent teeth removed was from 39% in Puerto Rico to 66.8% in Utah [2].

Limitations

The BRFSS is self-reported data, and respondents may not accurately recall their last dental visit. As it is a telephone survey, adults in households without a telephone are not included. Finally, the survey data are cross-sectional and cannot be used to determine causality.

Conclusion

The BRFSS provides state-level data on oral health status that can be examined for various sociodemographic groups. While the overall trends have not changed significantly from 2012 to 2016, sub-populations are identified with poorer oral

health outcomes that can be targeted through specific programs and outreach efforts. **NCMJ**

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