

Data & Methods

In early 2015, the American Dental Association's (ADA) Health Policy Institute, with input from the ADA Practice Institute and ADA Science Institute, developed a new comprehensive survey to assess how Americans view their oral health and how they interact with the U.S. oral health care system. Survey items measure respondents' self-reported oral health status and attitudes toward oral health as well as how often they visit the dentist, their insurance status, their source of insurance, and potential issues they have accessing oral health services.

In this methodological note, we summarize the methods for developing this new survey, collecting data, and analyzing survey responses. We focus specifically on the data reported in the Oral Health and Well-Being in the United States [fact sheets](#).¹

Questionnaire Development

The survey questions were developed by experts from the ADA's Health Policy Institute, Practice Institute and Science Institute. For oral health status, we were specifically interested in aspects of oral health such as pain and discomfort, ability to chew and speak, satisfaction with mouth function and aesthetics and, at the most comprehensive level, any physical, emotional and psychological effects derived from the condition of one's mouth. It is important to emphasize that we were not interested in objective, clinical measures of oral health, such as presence of dental diseases, number of missing teeth and number of restorations. We feel such measures do not adequately capture the contribution of mouth health to overall physical, social and emotional well-being from the perspective of the individual. Instead, we wanted to examine purely subjective, self-reported measures of mouth pain and discomfort (e.g. toothaches), mouth function (e.g. chewing and speaking), and mouth appearance (e.g. frequency that one avoids smiling).² We employ individual-specific ratings of oral health that, to our knowledge, are not measured in great depth in any other large-scale national surveys in the United States. The goal is to operationalize a definition of oral health as a core component of well-being, as concluded by the surgeon general in 2000.³

To develop survey questions regarding oral health status, we reviewed and adopted questions from established surveys. Specifically, we adopted a question from the 2008 National Health Interview Survey,⁴ a question from the 2007-2008 National Health and Nutrition Examination Survey,⁵ and several questions from the 2013 World Health Organization Oral Health Survey,⁶ which drew on the Oral Impact on Daily Performance Index.⁷ We also developed a question, internally, regarding the impact of the appearance of one's mouth and teeth on employment prospects.

We developed questions internally to assess attitudes toward oral health in order to capture the value that the general public places on various aspects of oral health and dental care. For this section, we focused on parameters that we felt captured priorities and preferences of the respondents. As there was limited existing literature in this area, we did not draw upon any specific research articles.

We solicited input on our proposed measures of oral health status and attitude from several international experts in academia who have published extensively on defining and measuring oral health based on self-reported indicators. The acknowledgements section has more details.

We included insurance status, source of insurance, access to dental services and oral health care utilization questions as part of the survey. These questions were adopted from a survey developed by the Health Policy Institute in 2014.⁸ Additionally, a variety of standard demographic questions such as age, education, household income and race/ethnicity were included.

[Appendix A](#) has the final questionnaire.

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Data Collection

Data were collected through an online survey administered by Harris Poll on behalf of the ADA Health Policy Institute from June 23, 2015 through August 7, 2015. Harris Poll obtained a total of 14,962 responses. Survey respondents were randomly selected from a group of individuals, ages 18 and older, who had agreed to participate in Harris Poll surveys as part of a panel. For more information about Harris Poll, please see [Appendix B](#).

First, Harris Poll conducted a pre-pilot, administering the survey through phone interviews between April 2, 2015 and April 13, 2015. Ten respondents read each survey question aloud and described any confusion or additional information that would be helpful in answering the question. Respondents were randomly selected and included both low-income and high-income adults. The respondents also answered each question via the web survey. Harris Poll provided us with the results of these interviews, including survey responses, notes regarding respondents' understanding of each question, and any additional comments regarding the applicability or clarity of the questions. Harris Poll also made suggestions, where appropriate, on how to modify the questions to make them more straightforward.

Next, Harris Poll fielded an online pilot survey in Montana and New York to gain a better understanding of how individuals would respond to the questions. We selected Montana and New York because they are two states of significantly different population sizes^{9,10} that have some level of adult Medicaid dental benefits.¹¹ We purposefully oversampled Medicaid enrollees in these two states to ensure that we were able to collect data that accurately reflect the experiences of low-income adults in accessing and utilizing dental services. Eighty-six adults in Montana and 150 adults in New York completed the pilot survey from April 16, 2015 through April 30, 2015. We received these data from Harris Poll in May 2015. To validate these preliminary data, we reviewed frequency distributions for outliers, confirmed that responses to branched questions matched the intended patterns for branching, confirmed correlations between responses to questions that should be related (e.g. questions 4, 5, and 7 in the survey), and tested internal consistency among survey items intended to measure oral health status and attitudes toward oral health (e.g. questions 7 and 9).

Harris Poll then fielded the online survey on a national scale from June 23, 2015 through August 7, 2015. We aimed to receive an oversample of 300 completed surveys in each state and the District of Columbia, with 100 completed surveys stratified across three income level categories: low-income individuals with household incomes at or below 138 percent of the federal poverty level (FPL), middle-income individuals with household incomes between 139 percent and 400 percent FPL, and high-income individuals with household incomes above 400 percent FPL. Harris Poll obtained 300 responses in all but seven states and the District of Columbia. This sampling design allows for state-level and national analysis by household income level.

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In order to categorize respondents by income level, respondents were asked how many individuals reside in their household and what their 2014 income was either before or after taxes. Income information was collected by presenting respondents with income ranges, and Harris Poll created midpoint values for each income range. Harris Poll then used the 2014 federal poverty guidelines published by the U.S. Department of Health and Human Services¹² to categorize each respondent as low-income, middle-income or high-income.

We selected the lower household income cutoff of 138 percent FPL based on the Medicaid eligibility expansion guidelines outlined in the Affordable Care Act.^{13,14} We acknowledge that not all states chose to expand Medicaid eligibility to all adults with household incomes at or below 138 percent FPL. However, using this income cutoff allows us to compare survey results between states that have expanded Medicaid eligibility and states that have not. We selected the upper household income cutoff of 400 percent FPL based on health insurance marketplace premium tax credit eligibility as established in the Affordable Care Act.¹⁵

Harris Poll generated weights for each respondent. Weighting adjusts a raw number of survey respondents to be representative of the percentage they make up in the population they are drawn from. The weights generated by Harris Poll take into account a respondent's race/ethnicity, education, region, household income, gender, age and state. The weights also account for respondents' propensity to be online given that survey responses were collected online. We applied Harris Poll weights in all of our analyses.



Data Validation and Cleaning

To validate the data, frequency distributions for all survey and demographic questions were reviewed for outliers by HPI staff. Responses for all survey questions were in range. Some outliers were identified for demographic questions but were retained in the final dataset with the intent to exclude these outliers from analyses as necessary.

Correlations between responses to questions that should be related were also examined. Expected relationships were confirmed. Specifically, respondents who reported better condition of the mouth (question 4) reported less frequently feeling that life in general was less satisfying because of problems with their mouth and teeth (question 5) and less frequently experiencing oral health problems (question 7).

Additionally, responses from branched questions were confirmed to match the intended branching patterns. Specifically, for respondents who answered that they do not have health insurance (question 10), the response to the question of how they acquired health insurance (question 12) was coded as "N/A." For respondents who answered "no" that they do not have dental insurance (question 11), the response to the question of how they acquired dental insurance (question 12) was coded as "N/A."

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Furthermore, a random selection of responses was used to replicate income category assignments based on the methodology used by Harris Poll. Using the weights provided by Harris Poll, HPI staff replicated the crosstabs by income category, age and gender.



Data Analysis

For the *Oral Health and Well-Being in the United States* report, we analyzed responses to questions regarding oral health status, oral health attitudes, dental care utilization and dental benefits coverage.

In all cases, responses were weighted in our analysis to bring them in line with the actual proportions of the population. As noted, weighting adjusts a raw number of survey respondents to be representative of the percentage they make up in the population they are drawn from. The weighting applied to our data took into account race/ethnicity, education, region, household income, gender, age and state in order to make the data reflect the actual composition of the U.S. adult population. We also accounted for respondents' propensity to be online given that survey responses were collected online. As a result, respondents are representative at the state and national level.

For the national fact sheet, we analyzed responses by household income, age, source of dental benefits and time since the respondent's last dental visit. For the state-specific fact sheets, we analyzed responses only by household income, as this was the objective of our sampling strategy. Categories for each of these variables are defined below.

Respondents were asked to select an income category that best describes their total 2014 household income before or after taxes. The income categories ranged from less than \$15,000 to \$250,000 or more. Harris Poll created midpoint values for each income range and used 2014 federal poverty guidelines published by the U.S. Department of Health and Human Services to categorize each respondent as low-income, middle-income or high-income.

Respondents were asked their birth year and were then grouped into four age groups: 18 through 34, 35 through 49, 50 through 64, and 65 and older.

Respondents were asked how they obtained their own individual dental insurance for 2015. Options provided were: employer (mine or my spouse/partner's); through the new health insurance marketplace; directly from the insurance company, not from the marketplace; Medicaid (including state versions such as Montana Medicaid or New York State of Health); Medicare; through a government program other than Medicaid/Medicare (e.g., VA, TRICARE, SSI); other; don't know; or not applicable – I do not have health insurance for 2015. Respondents were able to select all options that applied.

We grouped dental benefits into four categories. The category for private dental benefits includes respondent selections of employer, the new health insurance marketplace and directly from the insurance company. The category for Medicaid dental benefits includes respondent selection of Medicaid. The category for other

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dental benefits includes respondent selections of Medicare, through a government program other than Medicaid/Medicare, other and don't know. The category for no dental benefits includes respondent selection of N/A – I do not have dental insurance for 2015.

Respondents were asked how long it had been since they last had a dental visit and could select one of five options: less than 12 months, 1 to 2 years, 3 to 5 years, more than 5 years, or not applicable.



Overall Condition of Mouth and Teeth

Respondents were asked, “How would you describe the condition of your mouth and teeth?” and could select one of five options: poor, fair, good, very good, or don't know. There were 99 responses of “don't know,” and for the purposes of this analysis, we treated these responses as missing. We analyzed the responses to this question by household income, age and the self-reported time since the respondent's last dental visit.



Life in General is Less Satisfying Due to Condition of Mouth and Teeth

Respondents were asked, “How often during the past 12 months have you felt that life in general was less satisfying because of problems with your mouth and teeth?” and could select one of five options: never, rarely, occasionally, very often or don't know. There were 123 responses of “don't know,” and for the purposes of this analysis, we treated these responses as missing. We analyzed the responses to this question by household income and age.

We combined responses of “very often” and “occasionally” for the callout box included in the national factsheet.



Appearance of Mouth and Teeth Affects Ability to Interview for a Job

Respondents were asked, “Have you ever felt that the appearance of your mouth and teeth affected your ability to interview for a job?” and could select one of three options: yes, no or don't know. There were 752 responses of “don't know,” and for the purposes of this analysis, we treated these responses as missing. We analyzed the responses to this question by household income and age.

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How Often Have You Experienced the Following Problems in the Last 12 Months Due to the Condition of Your Mouth and Teeth?

Respondents were asked, “How often have you experienced each of the following problems related to your mouth and teeth during the past 12 months?” for 11 different oral health problems, listed in randomized order. The 11 oral health problems were presented as such: difficulty when biting or chewing foods, difficulty with speech or trouble pronouncing words, dry mouth, felt anxiety, felt embarrassment, avoided smiling, took days off work because of pain or discomfort, difficulty doing usual activities, reduced participation in social activities, problems sleeping, and experienced pain. For each of these problems, respondents could select one of five options: never, rarely, occasionally, very often or don’t know. For the purposes of this analysis, we treated responses of “don’t know” as missing. We analyzed the responses to this question by household income and age.

We combined responses of “very often” and “occasionally” for the callout boxes included in both the national and state fact sheets.



Attitudes Toward Oral Health and Dental Care

Respondents were asked, “How strongly do you agree or disagree with the following statements about how you perceive the health of your mouth?” for five different oral health statements, listed in randomized order. The five oral health statements were presented as such: I value keeping my mouth healthy; regular visits to the dentist will help keep me healthy; as I grow old I accept that I will lose some of my teeth; I need to see the dentist twice a year; and, it is easier to get ahead in life if I have straight bright teeth. For each of these statements, respondents could select one of five options: strongly disagree, somewhat disagree, somewhat agree, strongly agree or don’t know. For the purposes of this analysis, we treated responses of “don’t know” as missing. We analyzed the responses to this question by household income and age, but we did not present this analysis because, nationally, responses were consistent across these subgroups. There was variation by income in some states; state-specific data by income are available in the Data Tables available at www.ada.org/statefacts.

We combined responses of “strongly agree” and “somewhat agree” for the callout boxes included in both the national and state fact sheets.



Dental Care Utilization: What People Say and What People Do

Respondents were asked, “Do you plan to visit the dentist in the next 12 months?” and could select one of three options: yes, no or I am not sure. We used the responses to this question to define one’s intention to visit the dentist in the next 12 months.

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We considered two options for defining actual dental care utilization among adults: time since one's last dental visit as reported by our respondents and time since one's last dental visit as reported by the 2013 Medical Expenditure Panel Survey (MEPS). The MEPS is managed by the Agency for Healthcare Research and Quality, and the most current data available is from the 2013 MEPS which was released in September 2015. Compared to percentages reported by MEPS, the percentages reported by our respondents were higher in terms of the frequency with which adults visit the dentist. We used the MEPS data to represent actual dental care utilization in the national fact sheet because the MEPS is recognized as the most reliable data source for dental care utilization at the national level.¹⁶

For our comparison of intended dental care utilization and actual dental care utilization among adults, we analyzed responses by household income, age and source of dental benefits coverage. Unfortunately, MEPS data are not available at the state level, so we were unable to compare dental care utilization intentions to actual dental care utilization by state.



Reasons for Not Visiting the Dentist More Frequently, Among Those Without a Visit in the Last 12 Months

Respondents were asked, "How long since your last dental visit?" and could select one of five options: less than 12 months, 1 to 2 years, 3 to 5 years, more than 5 years or not applicable. Only those respondents that indicated it had been more than 12 months since their last dental visit were subsequently asked, "Why did you not visit the dentist more frequently?" and were instructed to select all options that applied: my mouth is healthy so I do not need to visit the dentist; I do not know where to go to receive dental services; I cannot afford to go to the dentist; it is too hard to find a dentist that accepts my dental plan or Medicaid; I cannot find the time to get to a dentist; many services are not covered by my dental plan or Medicaid, so I end up having to pay with my own money; I cannot travel to a dentist easily; I do not have any of my original teeth; I am afraid of going to the dentist; other; or, no reason.

We combined or relabeled these options into the following categories: afraid of dentist (I am afraid of going to the dentist); cost (I cannot afford to go to the dentist; many services are not covered by my dental plan or Medicaid, so I end up having to pay with my own money); inconvenient location or time (I cannot find the time to get to a dentist; I cannot travel to a dentist easily); no original teeth (I do not have any of my original teeth); no perceived need (my mouth is healthy so I do not need to visit the dentist); no reason (no reason); other (other); and trouble finding a dentist (I do not know where to go to receive dental services; it is too hard to find a dentist that accepts my dental plan or Medicaid). We analyzed responses to this question by household income, age and source of dental benefits coverage nationally.

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Appendix A: Survey Questions

Q1. In what country or region do you currently reside?

[Several Options, but all respondents chose “United States”]

Q2. In what year were you born?

[Response range: 1906-1997]

Q3. What is your zip code?

[Keyed response]

Q4. How would you describe the condition of your mouth and teeth?

[Poor, Fair, Good, Very Good, Don't Know]

Q5. How often during the past 12 months have you felt that life in general was less satisfying because of problems with your mouth and teeth?

[Never, Rarely, Occasionally, Very Often, Don't Know]

Q6. Have you ever felt that the appearance of your mouth and teeth affected your ability to interview for a job?

[Yes, No, Don't Know]

Q7. How often have you experienced each of the following problems related to your mouth and teeth during the past 12 months?

[Never, Rarely, Occasionally, Very Often, Don't Know]

- Difficulty when biting or chewing foods
- Difficulty with speech or trouble pronouncing words
- Dry mouth
- Felt anxiety
- Felt embarrassment
- Avoided smiling
- Took days off work because of pain or discomfort
- Difficulty doing usual activities
- Reduced participation in social activities
- Problems sleeping
- Experienced pain

Q8. Are the following statements true or false? If you are not sure, please make your best guess.

[True, False]

- Some medical conditions like diabetes affect the health of your mouth
- People who smoke are more likely to have cancer in their mouth
- Children do not need to see a dentist until they start school
- Because they do not stay in your child's mouth very long, baby teeth are not that important
- Some medicines can affect the health of your mouth
- Blood on your toothbrush is a sign of gum disease
- If I am not having any pain in my mouth, then my mouth is disease free
- Sugary foods and drinks cause tooth decay

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Q9. How strongly do you agree or disagree with the following statements about how you perceive the health of your mouth?

[Strongly Disagree, Somewhat Disagree, Somewhat Agree, Strongly Agree, Don't Know]

- I value keeping my mouth healthy
- Regular visits to the dentist will help keep me healthy
- As I grow old I accept that I will lose some of my teeth
- I need to see the dentist twice a year
- It is easier to get ahead in life if I have straight bright teeth

Q10. Do you currently have health insurance for 2015?

[Yes, No, Don't Know]

Q11. Do you currently have dental insurance for 2015?

[Yes, No, Don't Know]

Q12. How did you obtain your own individual health insurance for 2015?

Please select all that apply.

- Employer (mine or my spouse/partner's)
- Through the new health insurance marketplace
- Directly from the insurance company, not through the marketplace
- Medicaid
- Medicare
- Through a government program other than Medicaid/Medicare (e.g., VA, TRICARE, SSI)
- Other
- Don't know
- N/A—I do not have health insurance for 2015

Q13. How did you obtain your own individual dental insurance for 2015?

Please select all that apply.

- Employer (mine or my spouse/partner's)
- Through the new health insurance marketplace
- Directly from the insurance company, not through the marketplace
- Medicaid
- Medicare
- Through a government program other than Medicaid/Medicare (e.g., VA, TRICARE, SSI)
- Other
- Don't know
- N/A—I do not have health insurance for 2015

Q14. Ask if respondent does have dental insurance: How easy or difficult is it for you to find a dentist that accepts your dental insurance?

[Very Difficult, Somewhat Difficult, Somewhat Easy, Very Easy]

Q15. Do you have a single dentist or dental office that is your usual source of dental care?

[Yes, No]

Q16. How long since you last had a dental visit?

- Less than 12 months
- 1 to 2 years
- 3 to 5 years

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- More than 5 years
- N/A – I've never been to a dentist

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Q17. Do you plan to visit the dentist in the next 12 months?

[Yes, No, I am not sure]

Q18. Ask if last dental visit was more than 12 months: Why did you not visit the dentist more frequently? Please select all that apply.

- My mouth is healthy so I do not need to visit the dentist
- I do not know where to go to receive dental services
- I cannot afford to go to the dentist
- It is too hard to find a dentist that accepts my dental plan or Medicaid
- I cannot find the time to get to a dentist (e.g., cannot get the time off from work, dentist does not have convenient office hours)
- Many services are not covered by my dental plan or Medicaid, so I end up having to pay with my own money
- I cannot travel to a dentist easily (e.g., do not have transportation, located too far away)
- I do not any of my original teeth (i.e. I have no teeth, or I have dentures)
- I am afraid of going to the dentist
- Other
- No reason

Q19. Including yourself, how many people age 18 or older live in your household?

[Keyed response]

Q20. How many people under the age of 18 live in your household?

[Keyed response]

Q21. Are you currently receiving any Medicaid benefits?

[Yes, No, Don't Know]

Q22. Are you male or female?

[Male, Female]

Q23. Which one of the following best describes your employment status?

- Employed full time
- Employed part time
- Self-employed
- Not employed, but looking for work
- Not employed and not looking for work
- Retired
- Not employed, unable to work due to a disability or illness
- Student
- Stay-at-home spouse or partner
- Unknown

Q24. Which of the following income categories best describes your total 2014 household income before/after taxes?

- Less than \$15,000
- \$15,000 to \$24,999
- \$25,000 to \$34,999
- \$35,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 to \$124,999
- \$125,000 to \$149,999
- \$150,000 to \$199,999
- \$200,000 to \$249,999
- \$250,000 or more

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Q25. In what state, province or territory do you currently reside?

- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

Q26. How many hours per week do you typically spend on the Internet or World Wide Web?

[Keyed response]

Q27. What is your marital status?

- Never married
- Married or civil union
- Divorced
- Separated
- Widow/Widower
- Living with partner
- Unknown
- Decline to answer

Q28. What is the highest level of education you have completed or the highest degree you have received?

- Less than high school
- Completed some high school
- Completed high school
- Completed some college
- Completed college
- Completed some graduate school
- Completed graduateschool
- Associate Degree
- Job-specific training program(s) after high school
- Some college, but no degree
- Some college, but no 4 year degree
- College (such as B.A., B.S.)
- Some graduate school, but no degree
- Graduate degree (such as M.B.A., M.S., M.D., Ph.D.)
- M.A., M.S., M.F.A.
- M.B.A.
- Ph.D., Psy.D., or other academic doctorate
- J.D.
- M.D.
- Other graduate or professional degree

Q29. What is your race/ethnicity?

- White
- Black
- Asian or Pacific Islander
- Native American
- or Alaskan Native
- Mixed Race
- Some other race
- Hispanic
- African American
- First Nation/Native
- Canadian
- South Asian
- Chinese

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- Korean
- Japanese
- Other
 - Southeast Asian
- Filipino
- Arab/West Asian
- Decline to Answer
- Unknown

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Appendix B: About the Harris Poll

Over the last five decades, Harris Polls have become media staples. With comprehensive experience and precise techniques in public opinion polling, along with a proven track record of uncovering consumers' motivations and behaviors, the Harris Poll has gained strong brand recognition around the world. The Harris Poll offers a diverse portfolio of proprietary client solutions to transform relevant insights into actionable foresight for a wide range of industries including health care, technology, public affairs, energy, telecommunications, financial services, insurance, media, retail, restaurant and consumer-packaged goods.

All sample surveys and polls, whether or not they use probability sampling, are subject to multiple sources of error which are most often not possible to quantify or estimate, including sampling error, coverage error, error associated with nonresponse, error associated with question wording and response options, and post-survey weighting and adjustments.

Respondents for this survey were selected from among those who have agreed to participate in Harris Poll surveys. The data have been weighted to reflect the composition of the adult population.

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ENDNOTES

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