NHANES 1999-2000 Year 1 & 2 Data Release
Oral Health

1   Description

NHANES is critical for monitoring oral health status, risk indicators for disease, and access to preventive and treatment services. This component will address public health significance in areas of surveillance, prevention, treatment, dental care utilization, health policy, evaluation of Federal health programs, standardization of new methods, and oral health disparities.

Oral health data from NHANES will be used for:
- Assessing the prevalence of major oral health diseases and conditions including dental caries, periodontal disease, dental trauma, dry mouth, and fluorosis
- Assessing prevention and treatment efforts including the prevalence of dental sealants
- Evaluating specific public health programs/new policies and initiatives
- Monitoring the oral health status of minority/underserved populations
- Evaluating Healthy People 2000 and 2010 objectives related to oral health
- Supporting research activities as identified in the 2000 Surgeon General's Report on *Oral Health in the United States*

2   Eligible Sample Inclusion Criteria

Participants aged 2 years and older who do not meet any of the exclusion criteria

3   Exclusion Criteria

A positive response to any of the following medical health screening questions asked of participants aged 13 years or older will exclude them from the periodontal and root caries assessments. Participants aged 13 to 15 years must have a health proxy signed by a parent/guardian to participate in the oral health examination.

- Has a doctor or dentist ever told you that you must always take antibiotics (e.g. penicillin) before you get a dental check up or care?
- Do you have a heart problem (specifically congenital heart murmurs, heart valve problems, congenital heart disease, or bacterial endocarditis)?
- Do you have rheumatic fever?
- Kidney disease requiring renal dialysis?
- Hemophilia?
- Pacemaker or automatic defibrillator or artificial material in your heart veins or arteries?
- A hipbone or joint replacement?

4 Data Collection Methods

For oral health data collected in the mobile examination center, detailed information and instructions are discussed in the NHANES 2000 Oral Health Training Manual. For oral health data collected during the home interview, detailed information and instructions are described in the NHANES 2000 Home Interview Training Manual.

5 Examination and Interview Protocol

The following subcomponents are from the oral health examination component and home interview component with the age groups of interest in parentheses:

- Medical history screening (13 years and older)
- Dental sealant assessment (2 to 34 years of age)
- Tooth count (2 years and older)
- Coronal caries (2 years and older)
- Incisor traumatic injuries (10 to 29 years of age)
- Dental fluorosis assessment (6 to 49 years of age)
- Periodontal pockets, recession, loss of attachment, and gingival bleeding (18 years and older)
- Root caries (18 years and older)
- Recommendations for dental care (2 years and older)
- Dry mouth and problems with chewing food (40 years and older)
- Dental health perception, dental visits and dental care utilization (2 years and older)

6 Survey Staff

One of up to seven trained oral health recorders is paired with a licensed dentist to form a dental examination team. Two teams function independently throughout the data collection period. During the home interview, oral health data are collected by trained interviewers.

7 Data Collection Forms

Detailed placement and reading instructions are discussed in the NHANES Oral Health Training and Home Interview Training Manuals. Each chapter specifies procedures to be used for each of the oral health subcomponents.

8 Quality Control Procedures

The quality of data in this survey is controlled by (1) an intense training period for the dental teams with calibration of dental examiners prior to the beginning of the survey, (2) periodic monitoring and recalibration of dental examiners, and (3) periodic retraining of dental teams. The gold standard examiner will visit each team three times per year to observe field operations

and to replicate 20 to 25 dental examinations during each visit. The purpose of these "expert replications" is to determine if the field examiners are maintaining the examination standards achieved during training, and to measure the degree of deviation, if any, from those standards. If the inter-rater correlation is not within acceptable limits, retraining will be conducted on site and future monitoring of the field examiner intensified. Approximately 10% of examined participants are asked to return for a replicate exam. The purpose of these "repeat exams" is to monitor internal consistency within examiners regarding the data collection process. There will be an annual retraining session for each dental examiner, also conducted by the gold standard examiner.

9 Data Processing/Preparation Steps

Automated data collection procedures for the survey were introduced in NHANES 1999. In the mobile examination centers (MECs), data for the oral health component are recorded directly onto a computerized data collection form. The system is centrally integrated and it allows for ongoing monitoring of much of the data.

10 Analytic Notes

The oral health exam data will be released in the configuration of four "chapters." These chapters are: Dentition, Periodontal, Miscellaneous, and the Home Interview chapter. The oral health chapters and subcomponents in parentheses are matched as follows:

- Dentition (Tooth count, coronal caries, root caries, dental sealants, incisor trauma, and Fluorosis)
- Periodontal (Periodontal pockets, recession, loss of attachment, and gingival bleeding)
- Miscellaneous (Medical exclusions, care recommendations, and miscellaneous)
- Home Interview (Dry Mouth, dental visits, dental health perception)

11 Special Notes on Using the Dataset

The analysis of NHANES 1999-2000 oral health data must be conducted with the key survey design and basic demographic variables. The NHANES 1999-2000 Household Questionnaire Data Files contain demographic data, health indicators, and other related information collected during household interviews. They also contain all survey design variables and sample weights for these age groups. Other household questionnaire and oral questionnaire files may be linked to the oral health examination data file using the unique survey participant identifier SEQN.

Circumstantial factors have produced reasonable doubt as to the examined validity of assessing some anterior teeth for caries experience and incisor trauma. Consequently, a very few observations (3) have had the affected variables set to missing. Moreover, two dental sealant observations were change to a "9" (can not assess) during data preparation for public release because of inconsistency in the recorded data field.

The 1999-2000 dental examiner procedural manual lists a "C" as an acceptable call by the examiner for a crowned tooth, but "C' is not an allowable value. "C" was immediately converted to an acceptable surface code for restorations (e.g., "5689" for anterior teeth and "56789" for posterior teeth) by the direct data automated entry system at the time of data collection. Thus, a "C" is not listed as a possible code in the codebook. The examiner manual does refer to "C" as a "short call" for allowable restored surface codes.

NHANES 1999-2000 collected tooth-specific data on enamel fluorosis (EF) using Dean's Index, developed by H.T. Dean in the 1930s and 1940s. The examiner determines which of six ordinal categories (normal, questionable, very mild, mild, moderate and severe) best describes each tooth and assigns a corresponding score of 0, 0.5, 1, 2, 3 or 4, respectively. A tooth is scored as questionable (0.5) if:

The enamel discloses slight aberrations from the translucency of normal enamel, ranging from a few white flecks to occasional white spots. This classification is used in those instances where a definite diagnosis of the mildest form of fluorosis is not warranted and a classification of "normal" is not justified. (Burt and Eklund. 1999. Dentistry, Dental Practice and the Community, 5th Edition.) Included in this category are teeth that show no more than 1-2 mm of white opacity at the cusp tips of posterior teeth or incisal edges of anterior teeth.

If a person level score is to be determined, it should be based on the two teeth most affected by fluorosis. If the two teeth are not equally affected, the classification given is that of the less severely involved tooth. Following Dean's definition, a person would have a whole-mouth Dean's Index score of 0.5 (questionable) if two or more teeth have questionable signs and there are not two or more teeth with higher EF severity. This working definition of questionable allows many possible clinical presentations depending on the number of teeth with questionable signs of EF (from 2-28). In addition, Dean's definition allows a person with one tooth having very mild or higher EF to be classified as having questionable enamel fluorosis, if that tooth is the only tooth with higher than questionable clinical signs. When Dean's data for populations exposed to 0.9 and 1.2 ppm F in the drinking water are plotted, a dose-response is observed from "No" EF (highest proportion) to "Severe" EF (smallest proportion). In estimating prevalence, Dean did not include children with "questionable" EF.

In the NHANES 1999-2000 data, the distribution of EF severity appears bimodal, with peaks at "Normal" EF and "Very Mild" EF. It appears that examiners often assigned codes of either "Normal" or "Very Mild" EF, rather than use the "Questionable" category. It should be kept in mind that examiners assigned codes to individual teeth and not to the person; therefore, it is plausible that the bimodal presentation may reflect a shift in the application of Dean's diagnostic criteria. At this time, staffs of the Division of Oral Health (DOH), CDC, and the National Institute of Dental and Craniofacial Research (NIDCR), in coordination with NCHS, are analyzing these data. Point estimators as well as potential limitations of these data will be published during 2004. Furthermore, the future release of NHANES data for 2001-2002 will allow further analysis of these issues.

Although the current NHANES was designed to produce a nationally representative sample for each 2-year data collection interval, the sampling frame was designed to produce reliable estimates using 6-years of data for analyses using lower prevalent conditions. For some low prevalent conditions, which may also have geographical variation (such as EF produced by natural fluoride levels in the drinking water), reliable and precise analyses may not be possible with only two years of data.

For these reasons, the interpretation of age-specific estimates of EF prevalence and severity (in the lowest categories) using the 1999-2000 dataset should be made with caution. Comparisons with the previous national survey of enamel fluorosis (National Institute of Dental Research, 1986-1987) should take into account, in addition to the information noted here, the different protocols and sampling designs. Researchers are encouraged to review the descriptive documentation for each of these surveys before reaching epidemiological conclusions regarding possible trends.