

## NHANES UPDATE: PLANS FOR NHANES III

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### Background

Since 1960 the National Center for Health Statistics (NCHS) has been responsible for producing vital and health statistics for the United States. Over the years the Center has developed a diversified Program of surveys and inventories. NCHS is currently planning a National Health and Nutrition Examination Survey (NHANES III) to begin in 1988. This is the latest of a series of studies (see below) involving interviews, physical examinations, and diagnostic and biochemical testing of a representative sample of Americans.

<u>Surveys</u>	<u>Dates</u>	<u>Ages</u>
NHES I	1960-62	18-79 yrs
NHES II	1963-65	6-11 yrs
NHES III	1966-70	12-17 yrs
NHANES I	1971-75	1-74 yrs
NHANES II	1976-80	6 mos-74 yrs
NHANES	1982-84	6 mos-74 yrs
NHANES I Follow-up	1982-	25-74 yrs
NHANES III	1988-1994	2 mos+

The plans for NHANES III incorporate certain features which will distinguish it from earlier surveys in the series. These features include a longitudinal component, meaning that individuals will be followed over time for vital status and possible re-examination; an analytic as well as a descriptive orientation; automated data collection; and long-term biological specimen banking. These special features will increase the public health and scientific yield from the survey and will allow for responsiveness to emerging hypotheses and health issues.

The survey sample selection procedures will be designed to yield national estimates of diseases and health characteristics. A stratified, multistage, probability cluster sample of households will be enumerated. Persons selected from within these households will be requested to respond to a detailed questionnaire about dietary practices, health habits, and diseases. Upon completion of the household interview, respondents will be asked to undergo a voluntary physical assessment which will take place in a mobile examination center (MEC). Each MEC will consist of four large, 45-foot long inter-connected trailers. The trailers will contain facilities for conducting interviews in a private clinical setting, and for making physical assessments such as anthropometric measurements and bone densitometry, for blood drawing, and for physical and dental examinations. Each MEC will also contain a laboratory and a computer room.

### Sample Design Features

It is estimated that up to 60,000 Americans in randomly selected communities will be interviewed, and 45,000 examined over two 3-year sequential waves of data collection. Interviews and examinations will begin in the fall of 1988 after a period of extensive developmental work and pretesting. Special sampling of children (as young as 2 months) and the elderly (with no upper age cutoff) will permit reliable estimates of the health of these groups. Another special design feature, oversampling of the black and certain Hispanic populations, means that the health of these groups can be evaluated.

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Public Health and Research Goals for NHANES III:

1. To estimate the prevalence of diseases and risk factors
2. To estimate the incidence of diseases
3. To estimate the prevalence of functional impairment
4. To provide population reference distributions of health characteristics
5. To monitor secular changes in diseases and risk factors
6. To identify reasons for secular trends in health
7. To assess the natural history of diseases
8. To establish the need for health care based on physical diagnosis
9. To identify new risk factors for disease and contribute to an understanding of disease etiology
10. To estimate the attributable risk of disease

Survey Content

Extensive solicitation of topics for inclusion in NHANES yielded nearly 100 proposals from the Federal, State, and private sectors. The NCHS identified 30 areas of public health relevance to NHANES III and then developed 30 comprehensive planning proposals, drawing heavily from the 100 solicited proposals in some cases, and augmenting them in others. These NCHS proposals outlined the rationale and aims to be met by the survey. These proposals were reviewed intensively with careful assessment of a set of guidelines related to scientific merit, public health importance, feasibility, and joint relevance to other proposed topics.

As in previous surveys, nutrition assessment will be a focal point of the survey and nutritional status will be measured by estimating food and nutrient intake, performing hematological determinations and nutritional biochemistries, and taking physical measures (see page 4). These procedures will provide reference distributions and risk factor prevalence estimates and will also permit etiologic studies. Anthropometry will be performed and related to nutrition, disease, and health habits. A dental exam will provide valuable data on trends and correlates of caries and periodontal disease. NHANES III will also be particularly useful in establishing reference distributions for hearing levels and visual acuity. Specialized examination procedures will be tailored to the elderly and children; for example, additional assessments of physical disabilities and cognitive functioning are planned for the elderly.

Gallbladder sonography will yield national prevalences of gallstones, an important contributor to hospitalization stays in the United States. Another chronic disease with high morbidity, diabetes, will be evaluated by glucose tolerance testing. Lung function and conditions of the respiratory system will be assessed by spirometry and by questions on asthma and symptoms related to chronic obstructive pulmonary disease. The NHANES III program will continue to make an important public health contribution by monitoring secular changes in the prevalence of cardiovascular disease (CVD) risk factors. Physical activity, awareness and treatment of high blood pressure and elevated blood cholesterol, smoking, and CVD-related dietary intake and dietary habits will be assessed by questionnaire.

Laboratory analyses of biological specimens will measure exposure to toxic metals, serum antibody levels for sexually transmitted diseases as well as common childhood diseases, and hormone levels. One innovative and important study component will involve storing specially treated white blood cells to allow estimation of the prevalence of genetic alleles in order to study genetic susceptibility to selected major chronic diseases. To estimate the prevalence and severity of allergic syndromes, the allergy component will include an integrated series of measurements: skin testing and serologic measurements of immunoglobulins.

The NHANES III efforts in the area of cancer research involve obtaining questionnaire data and biologic specimens, and conducting certain medical examination procedures to estimate the prevalence of known risk factors; confirming the importance of suspected risk factors; and

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identifying new risk factors. Tobacco use data, measured by questionnaire with biochemical validation, will be used as a covariate in numerous analyses and as a primary variable in the assessment of health effects, particularly those due to exposure passively to the smoke of others. Similarly, information on reproductive characteristics will be obtained to aid in the interpretation of health findings and as primary analytic variables. The prevalence of depression and anxiety will be measured by questionnaire.

Radiographs of the hands, feet, and knees will be collected to estimate the prevalence of arthritis. The osteoporosis component will include bone densitometry. Kidney function will be measured primarily by means of questionnaire items and laboratory tests of serum creatinine; persons with high serum creatinine may be followed to explore the natural history of kidney diseases. Occupational health needs will be served by obtaining estimates of lung function, central and peripheral nerve functioning, and hearing levels for working persons.

For further information regarding NHANES III contact:

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Tentative Content for NHANES III Nutrition Component  
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A. Dietary intake data

- 1) 24-hr dietary recall - automated interview in Mobile Exam Center - quantitative dietary intake data
- 2) General food frequency - qualitative dietary intake data - targeted to vitamins A and C and calcium
- 3) Alcohol intake - current, historical, binge drinking
- 4) Use of discretionary salt, food preparation methods
- 5) Type and amount of tap water intake

B. Other dietary questionnaire data

- 1) Family income, education, household composition, etc.
- 2) Infant feeding practices - breastfeeding, introduction of solid foods, milk or type of formula fed, etc.
- 3) Participation in school breakfast, school lunch, food stamps, supplemental feeding programs (e.g., WIC), etc.
- 4) Periodic food shortages in the home
- 5) Lifestyle questions - salt and fat used in food preparation, meal patterns, meals eaten away from home, etc.
- 6) Historical dairy food (calcium) consumption

C. Vitamin/mineral supplement usage - detailed type (brand) and quantity of supplements taken

D. Anthropometry data

- 1) Height, weight, skinfolds, circumferences, breadths
- 2) Bioelectrical impedance to estimate body fat
- 3) Questions on weight history, diet aids, bulimia, weight loss diets

E. Blood and urine assessments

- 1) Hematological assessments
- 2) Nutritional biochemistry assessments
- 3) Blood lipids and lipoproteins
- 4) Urinary assessments