

Understanding and Analyzing Data From NHANES Overview and Basic Analyses



**Centers for Disease Control and Prevention
National Center for Health Statistics**

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First Step

- Review the tutorial
- Easiest way to learn about NHANES
 - Hands on

Why was this tutorial created?

- **NCHS & the National Cancer Institute (NCI) developed the web-based tutorial to**
 - **meet growing demands of NHANES data users**
 - **promote broader & more proficient use of NHANES data**

How the Tutorial Works

- **Main tutorial made up of 17 modules**
- **Modules organized into four courses**
 - **Survey Orientation**
 - **Preparing Analytic Dataset**
 - **Survey Design Factors**
 - **Analyzing Data**

What does the tutorial provide?

- **Simulates a real life experience - conduct analytical project from beginning to end**
- **Relevant NHANES data information & nuances**
- **Tips & explanations for SAS, SUDAAN and STATA programs**
- **Downloadable sample program code & analytical guidance**

Tutorial: Multiple Tutorials

Survey

Main Tutorial

Dietary Data

Environmental Data

NHANES I,II & III

NHANES CMS Linked Data

Physical Activity & CV Fitness



How the Tutorial Works

- **Each module is free-standing**
- **Can start anywhere & move around as you wish**
 - **later modules often build on previous ones**
 - **greater level of statistical & epidemiologic knowledge assumed for later modules**

How the Tutorial Works, cont'd

- **Format varies, depending on the module type**
- **Navigational layout - split screen**
 - **tutorial is on the left**
 - **live NHANES website on the right**
- **Analytic layout**
 - **Annotated code**
- **Animations available in each lay-out**

Challenges

- **Deadline and Finite Resources**
- **Quantity and complexity of the information**
- **Novice vs experienced users**
- **NHANES vs SAS/SUDAAN focus**
- **Moving target – Web redesign and Data updates**

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CDC 24/7: Saving Lives. Protecting People. Saving Money Through Prevention.

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National Health and Nutrition Examination Survey

National Health and Nutrition Examination Survey

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The National Health and Nutrition Examination Survey (NHANES) is a program of studies designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations.

[Selected Participants](#)

Have you been selected to take part in the National Health and Nutrition Examination Survey?

[Information](#)

Learn about the benefits with the National Health and Nutrition Examination Survey

[NHANES National Youth Fitness Survey](#)

The NHANES National Youth Fitness Survey (NYFS) collects data on exercise and the nutrition habits of U.S. youth through

What's New

Publications

- [The National Health and Nutrition Examination Survey: Sample Design, 1999–2006](#)  [PDF - 1.41 MB]
- [Health Characteristics of Medicare Traditional Fee-for-Service and Medicare Advantage Enrollees: 1999–2004 National Health and Nutrition Examination Survey Linked to 2007 Medicare Data](#)  [PDF - 178 KB]
- [Osteoporosis or Low Bone Mass at the Femur Neck or Lumbar Spine in Older Adults: United States, 2005–2008](#)
- [Total and High-density Lipoprotein Cholesterol in Adults: National Health and Nutrition Examination Survey, 2009–2010](#)
- [Infectious Disease Prevalence in Los Angeles County—A Comparison to National Estimates, 1999–2004](#)

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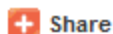
NHANES Dietary

NHANES Physical Activity
and Cardiovascular
Fitness Data Tutorial

NHANES Environmental
Chemical Data

NHANES-CMS Linked Data
Tutorial

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Before you get started:

Introduction Read this page to find answers to frequently asked questions about this tutorial.

Technical & Software Requirements Find out what's required to view the tutorials correctly and run the sample programs properly.

Jump Start Guide Get a jump on the features of this tutorial and how to use them.

How It Works Learn how make the tutorial work for you!

Tech Tips Have you had technical issues using the tutorial? Use the Troubleshooting page to solve them.

Course Credit Find out how you can get continuing professional credit for this tutorial.

**Use Jump Start Guide
for quick reference**

To report problems or
questions to

Web Tutorial email. Do not direct
feedback and we will not be able to reply.



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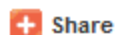
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Jump Start Guide

NHANES Web Tutorial

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This guide will show you how to use the tutorial to get the most out of your experience. This guide covers several areas:

- [How the Tutorials Work](#)
Find out how to use the main templates, features and activities in these tutorials, and use this link as a quick guide to orient yourself for maximum efficiency.
- [Technical & Software Requirements](#)
Find out what technical and software requirements are required to view the tutorials correctly, as well as run the sample programs properly.
- [Knowledge & Skill Requirements](#)
Find out what basic knowledge and skills are required to use these tutorials as self-learning tools.

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Survey Orientation Course

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The Survey Orientation course includes three modules:

Module 1. [Survey Overview](#)

Module 2. [Navigate NHANES Website](#)

Module 3. [Data Structure & Contents](#)

These three modules provide a general overview of the Continuous NHANES survey conducted since 1999, its website and data structure. NHANES contains a vast amount of data that is organized and released in separate data files on the NHANES website. These data files are organized according to certain conventions. Therefore, a thorough understanding of how information is laid out on the NHANES website and how the data files are organized will help you be more efficient in finding the information you need for your analysis.

Whether you are a novice or an experienced analyst, we recommend that you review this entire course before starting the tutorial, as these three modules serve as a roadmap that will help you get oriented quickly or refresh your knowledge of NHANES.

Users who wish to pick and choose topics of interest in this course may do so by using the navigation bar to the left or by using the [Tutorial A-Z Index](#).

The course begins with Survey Overview, where you will learn about the history and methodology of NHANES as well as some of the ways in which NHANES data have been used in the past. In the next module, [Navigate the NHANES Website](#), you will learn where to find different documents, how

Use tabs to change between tutorials

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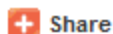
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Preparing an Analytic Dataset Course

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The Preparing an Analytic Dataset course includes six modules:

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[Module 5. Format & Label Variables](#)
[Module 6. Save a Dataset](#)

If you are a new analyst, we encourage you to approach these six modules in sequential order. If you are an experienced analyst, we encourage you to approach these six modules in the order that best suits your needs. In the different tasks and steps in each module, you will learn about the different tasks and steps in each module, and how they fit into the overall process an analyst goes through when preparing an analytic dataset.

If you are an experienced analyst who only needs specific information to help you complete an analysis on your own, you can pick and choose topics of interest from the navigation bar to the left, or from the [Tutorial A-Z Index](#). You may also go to the [Sample Code and Datasets page](#) to download and modify sample programs and datasets for your own use.

The computer software, knowledge, and skills requirements are listed for your convenience on the [Software & Technical Requirements page](#). The [Tech Tips page](#) can help you troubleshoot if you run into any problems.

- courses for NH99+ (continuous)
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The Survey Orientation course includes three modules:

Module 1. [Survey Overview](#)Module 2. [Navigate NHANES Website](#)Module 3. [Data Structure & Contents](#)

These three modules provide a general overview of the Continuous NHANES survey conducted since 1999, its website and data structure. NHANES contains a vast amount of data that is organized and released in separate data files on the NHANES website. These data files are organized according to certain conventions. Therefore, a thorough understanding of how information is laid out on the NHANES website and how the data files are organized will help you be more efficient in finding the information you need for your analysis.

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The course begins with Survey Overview, where you will learn about the history and methodology of NHANES as well as some of the ways in which NHANES data have been used in the past. In the next module, Navigate the NHANES Website, you will learn where to find different documents, how to access datasets, and how to get help with NHANES data. Finally, Data Structure & Contents will show you how the data are organized.

The requirements for computer software, knowledge and skills are listed for your convenience on the [Software & Technical Requirements page](#). The [Tech Tips page](#) can help you troubleshoot if you run into technical difficulties. Before beginning the course, please see the [Jump Start Guide](#) for more information about how to use the tutorial and its features. To learn more about the CEU, CME, and CNE credit/contact hours offered for this course, see the [Course Registration page](#).

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All NHANES

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Purpose

This module provides an overview of the National Health and Nutrition Examination Surveys (NHANES) by briefly describing the surveys history, methodology, and uses of the data.

Task 1: Review Survey History

Since 1959, the National Center for Health Statistics (NCHS) has been continuously monitoring the health status of the US population through a nationally representative survey utilizing health interview and physical examination data. The populations surveyed and questionnaire topics have evolved over time to accommodate a variety of public health and research priorities.

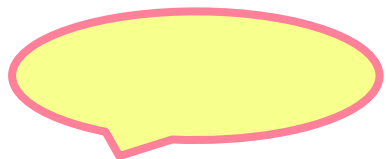
- [Key Concepts about Survey History](#)



Task 2: Describe Survey Methodology

The NHANES program is unique in that it combines interviews with physical examinations and laboratory studies. NHANES adopted these three data collection modes to maximize the efficiency, quality, and accuracy of data collected.

- [Key Concepts about Survey Methodology](#)



Task 3: Explain Uses of the Data

The US Public Health Service, other federal agencies, and a wide range of researchers are major users of NHANES data. These data have been central to the formulation of public health policy and practice.

- [Key Concepts about Uses of the Data](#)



Related Sites

- [NHANES III Web Tutorial](#)
- [NHANES II Web Tutorial](#)
- [NHANES I Web Tutorial](#)
- [NHANES Dietary Data Tutorial](#)
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Navigate NHANES Website

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All NHANES

Purpose

The NHANES website is the most important data source and analytical resource for all data users. Since the website contains both historic and current datasets, and covers a wide range of critical topics, it is very important to learn how to navigate this website and use these resources effectively.

Task 1: Navigate the NHANES Homepage

By getting acquainted with the NHANES homepage, you will gain an appreciation for the number and diversity of materials available through the NHANES website.

- Key Concepts about Navigating the NHANES Homepage
- How to Navigate the NHANES Homepage

Navigate

Task 2: Find Datasets

All publicly available data and related documentation are released and updated on the NHANES website. Information on accessing non-publicly released data is also available on the NHANES website.

- Key Concepts about Datasets on the NHANES Website
- How to Find Publicly Released Datasets and Information on Non-publicly Released Datasets

Find Datasets

Related Sites

[NHANES III Web Tutorial](#)

[NHANES II Web Tutorial](#)

[NHANES I Web Tutorial](#)

[NHANES Dietary Data Tutorial](#)

[NHANES Physical Activity and Cardiovascular Fitness Data Tutorial](#)

Task 3: Find Survey Background Information

Reviewing the NHANES survey background information is an important step as you determine the scope of your analysis and which variables to include.

- Key Concepts about Finding Survey Background Information
- How to Find Survey Background Information

Find Background Information

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[NHANES Environmental Chemical Data Tutorial](#)

[NHANES-CMS Linked Data Tutorial](#)

[National Health and Nutrition Examination Survey](#)

Task 4: Find the Analytic and Reporting Guidelines

The Analytic and Reporting Guidelines should be used for NHANES data analyses and publications. The suggested guidelines provide users a framework for producing estimates that conform to the analytic design of the survey.

- [Key Concepts about Finding the Analytic and Reporting Guidelines](#)
- [How to Find the Analytic and Reporting Guidelines](#)

Analytic and Reporting Guidelines

Task 5: Use the What's New Page

The What's New page is an important resource for staying updated with current information about the survey, including newly released data files. It is an important link to refer to on a periodic basis.

- [Key Concepts about Using the What's New Page](#)
- [How to Use the What's New Page](#)

What's New

Task 6: Review the Frequently Asked Questions (FAQs) Page

The FAQs will help you with common questions about NHANES.

- [Key Concepts about Using the Frequently Asked Questions Page](#)
- [How to Use the Frequently Asked Questions](#)

FAQs

Task 7: Find Important NHANES Citations

NHANES researchers are often asked to cite the data source for their research proposals and related publications.

- [Key Concepts about Finding Important NHANES Citations](#)
- [How to Find Important NHANES Citations](#)

NHANES Citations

Task 8: Identify How to Get Help

There are two additional resources available for getting help: the NCHS email query and the NHANES listserv.

- [Key Concepts about Getting Help](#)
- [How to Get Help](#)

Get Help



Data Structure & Contents

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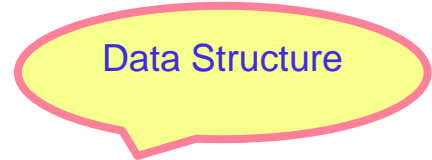
Purpose

This module describes how Continuous NHANES data are structured and organized.

Task 1: Explain NHANES Data Structure

Before you begin a search for any specific survey contents on the website, you should first understand the organizing principles of the NHANES data structure.

- Key Concepts about the Data Structure



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[NHANES Dietary Data Tutorial](#)

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The Preparing an Analytic Dataset course includes six modules:

Module 4. [Locate Variables](#)Module 5. [Download Data Files](#)Module 6. [Append & Merge Datasets](#)Module 7. [Clean & Recode Data](#)Module 8. [Format & Label Variables](#)Module 9. [Save Dataset](#)

If you are new to NHANES data analysis, we encourage you to approach these six modules in sequence. By choosing to go sequentially through the different tasks and steps in each module, you will follow an order that resembles the real life process an analyst goes through when preparing an analytic dataset.

If you are an experienced analyst who only needs specific information to help you complete an analysis on your own, you can pick and choose topics of interest from the navigation bar to the left, or from the [Tutorial A-Z Index](#). You may also go to the [Sample Code and Datasets page](#) to download and modify sample programs and datasets for your own use.

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Locate Variables

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Purpose

Variables and the information about the variables is stored in various types of data and documentation files. You need to know what information is in these files and how to access them to prepare for your analysis. You use this documentation to [decide which variables to include](#) in your analysis, [identify the variable names and file locations](#), and [consult the data file documentation](#) for detailed data processing and analytic information.

Task 1: Decide which variables to include

Your analysis will require a subset of the variables available in NHANES. To decide which variables are needed in your analysis, you need to review the survey documentation.

- [Key Concepts about Deciding Which NHANES Variables to Include](#)
- [How to Decide Which NHANES Variables to Include](#)

Which variables

Task 2: Identify variable names and file locations

Variables are stored in different components. Use the variable list of each component to identify the variable names and file locations.

- [Key Concepts about Identifying Variable Names and File Locations](#)
- [How to Identify Variable Names and File Locations](#)

Identify variable names and file locations

Task 3: Consult the documentation

Before analyzing the data, you will need to know how the variable is coded, data editing, processing, and collection information, and the frequency (or sample size) of the variable. This information is found in the documentation.

IMPORTANT NOTE

You cannot determine whether a variable is appropriate to use in your analysis without consulting the data file documentation. Variables may have similar names, be auxiliary, or used for excluding sample persons from certain measures. Read the documentation.

- [Key Concepts about Consulting Data File Documentation](#)
- [How to Consult the Data File Documentation](#)

documentat

Related Sites

- [NHANES III Web Tutorial](#)
- [NHANES II Web Tutorial](#)
- [NHANES I Web Tutorial](#)
- [NHANES Dietary Data Tutorial](#)
- [NHANES Physical Activity](#)

Download Data Sets

- 2009-2010
 - Demographic: demo_f
 - Body measures: bmx_f
 - Total nutrients day 1: dr1tot_f
- 2011-2012
 - Demographic: demo_g
 - Body measures: bmx_g
 - Total nutrients day 1: dr1tot_g

Run SAS on your own computer

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Survey Design Factors Course

Continuous NHANES Web Tutorial

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**Continuous****NHANES III****NHANES II****NHANES I**

The Survey Design Factors course includes three modules:

Module 10. [Sample Design](#)Module 11. [Weighting](#)Module 12. [Variance Estimation](#)

These three modules provide an overview of the design features for the Continuous NHANES samples, as well as how to correctly account for these design features in analyses.

The Sample Design module describes the complex sampling design of NHANES, which includes multi-stage, unequal probability, and cluster sampling methods. This module also explains how to specify sampling parameters in an analysis. The Weighting module describes how NHANES weights are calculated to take into account survey nonresponse, oversampling, post-stratification, and sampling error. More importantly, this module teaches how to select the correct weights for an analysis. The Variance Estimation module introduces methods to calculate variance estimates and degrees of freedom.

These modules will provide analysts who are new to NHANES with an in-depth knowledge of the survey™s sampling and weighting procedures and basic tools for calculating variance estimates.

The computer software, knowledge, and skills requirements are listed for your convenience on the [Software & Technical Requirements page](#). The [Tech Tips page](#) can help you troubleshoot if you run into technical difficulties. Before beginning the course, please see the [Jump Start Guide](#) for more information about how to use the tutorial and its features. To learn more about the CEU, CME, and CNE credit/contact hours offered for this course, see the [Course Registration page](#).

Related Sites

[NHANES III Web Tutorial](#)[NHANES II Web Tutorial](#)[NHANES I Web Tutorial](#)[NHANES Dietary Data Tutorial](#)[NHANES Physical Activity and Cardiovascular Fitness Data Tutorial](#)

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National Health and Nutrition Examination Survey

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E-mail questions about activities or products

Disseminates Information on NHANES data releases, activities, and products and provides for sharing of analytic strategies

Related Sites

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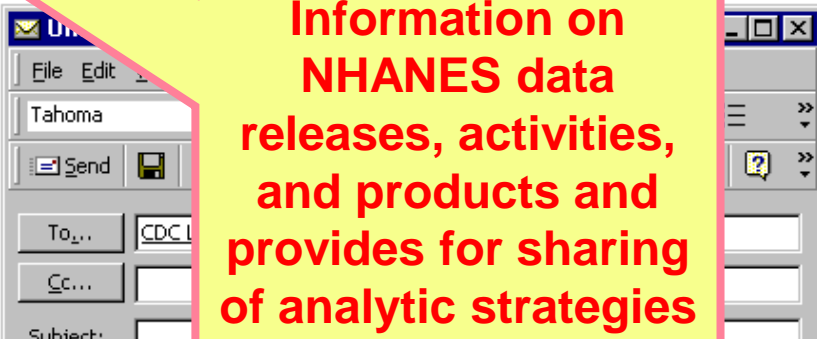


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