National Health and Nutrition Examination Survey

2005-2006 Data Documentation, Codebook, and Frequencies

Cholesterol - Total (TCHOL_D)

Data File: TCHOL_D.xpt

First Published: November 2007

Last Revised: April 2010

Component Description

Total Cholesterol and HDL-Cholesterol

The goals of this component are:

1. to monitor the prevalence and trends in major cardiovascular conditions and risk factors in the U.S.; and
2. to evaluate prevention and treatment programs targeting cardiovascular disease in the U.S.
   The main element of the cardiovascular disease laboratory component in NHANES is blood lipid levels. Cardiovascular disease is the leading cause of death in the United States. The data will be used to monitor the status of hyperlipidemia and the success of the National Cholesterol Education Program.

Eligible Sample

Participants aged 6 years and older who do not meet any of the exclusion criteria were sampled.

Description of Laboratory Methodology

Data Collection Methods

In the mobile examination center (MEC) laboratory, blood specimens are processed, stored, and shipped to the Johns Hopkins University Lipoprotein Analytical Laboratory for analysis.

Examination Protocol

Detailed specimen collection and processing instructions are described in the NHANES Laboratory/Medical Technologists Procedures Manual (LPM). Vials were stored under appropriate temperature conditions (stored at -20 degrees Centigrade) until they were shipped to Johns Hopkins University Lipoprotein Analytical Laboratory for testing. The analytical methods are described in the Analytic Methodology section of this document.

Data Collection

Detailed specimen collection and processing instructions are discussed in the LPM. Each chapter in the LPM specifies the procedure to be used for preparation, labeling, processing, preservation, and transport of the specimens.

Analytic Methodology

Total Cholesterol

There were changes in the instruments used to measure total cholesterol, but the method and lab site were the same as 2003- 2004. In 2005, total cholesterol was measured enzymatically in serum using the Roche Hitachi 717. In 2006, total cholesterol was measured enzymatically in serum using the Roche Hitachi 717 and 912. No adjustment was necessary for the change in instrumentation for total cholesterol.

Hitachi 717 and 912

Total cholesterol is measured enzymatically in serum or plasma in a series of coupled reactions that hydrolyze cholesteryl esters and oxidize the 3-OH group of cholesterol. One of the reaction byproducts, H_2O_2 is measured quantitatively in a peroxidase-catalyzed reaction that produces a color. Absorbance is measured at 500 nm. The color intensity is proportional to cholesterol concentration. The reaction sequence is as follows:

$$\text{Cholesteryl ester} + H_2O \xrightarrow{\text{cholesteryl ester hydrolase}} \text{cholesterol} + \text{fatty acid}$$

$$\text{Cholesterol} + O_2 \xrightarrow{\text{cholesterol oxidase}} \text{cholest-4-en-3-one} + H_2O_2$$

$$2H_2O_2 + \text{4-aminophenazone} + \text{phenol} \xrightarrow{\text{peroxidase}} \text{4-(p-benzoquinone monoimino)-phenazone} + 4\ H_2O$$

Data Processing and Editing

Blood specimens were processed, stored, and shipped to Johns Hopkins Hospital, Baltimore, MD for analysis. Detailed specimen collection and processing instructions are discussed in the NHANES Laboratory/Medical Technologists Procedures Manual (LPM). Read the LABDOC file for detailed data processing and editing protocols. The analytical methods are described in the Description of the Laboratory Methodology section.

One derived variable was created in this data file. The formula for their derivation is as follows:

LBDTCSI:

The total cholesterol in mg/dL (LBXTC) was converted to mmol/L (LBDTCSI) by multiplying by 0.02586.

Detailed instructions on specimen collection and processing can be found on the NHANES web site.

Analytic Notes

LBXTC:

The Lipid Laboratory Total Cholesterol data file contains laboratory test results for total cholesterol (LBXTC), which uses the reference analytic method. However, the NHANES standard biochemistry profile laboratory also includes measurements of total cholesterol. The biochemistry profile total cholesterol variable name is LBXSCH. The appropriate variable to use is LBXTC from the Lipid Laboratory.

In cases where the result was below the limit of detection, the value for that variable is the detection limit divided by the square root of two.

Exam sample weights should be used for analyses. Please refer to the Analytic Guidelines for further details on the use of sample weights and other analytic issues. The Analytic Guidelines are available on the NHANES website.

Codebook and Frequencies

SEQN - Respondent sequence number

Variable Name:	SEQN
SAS Label:	Respondent sequence number
English Text:	Respondent sequence number.
Target:	Both males and females 6 YEARS - 150 YEARS

LBXTC - Total cholesterol (mg/dL)

Variable Name: LBXTC

SAS Label: Total cholesterol (mg/dL)

English Text: Total cholesterol (mg/dL)

Target: Both males and females 6 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
78 to 615	Range of Values	7360	7360	
.	Missing	726	8086	