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Third National Health and Nutrition Examination Survey
(NHANES III), 1988-94

Catalog Number 76300

NHANES III LABORATORY DATA FILE DOCUMENTATION

Ages one year and older

First Published: December 1996
Last Revised: September 2006

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Introduction

The National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention (CDC) collects, analyzes, and disseminates data on the health status of U.S. residents. The results of surveys, analyses, and studies are made known through a number of data release mechanisms including publications, mainframe computer data files, CD-ROMs (Search and Retrieval Software, Statistical Export and Tabulation System (SETS)), and the Internet (http://www.cdc.gov/nchswww/nchshome.htm).

The National Health and Nutrition Examination Survey (NHANES) is a periodic survey conducted by NCHS. The third National Health and Nutrition Examination Survey (NHANES III), conducted from 1988 through 1994, was the seventh in a series of these surveys based on a complex, multi-stage sample plan. It was designed to provide national estimates of the health and nutritional status of the United States' civilian, noninstitutionalized population aged two months and older.

Data from NHANES III are being released in five public release data files:

NHANES III Household Adult Data File (Catalog Number 77560)

NHANES III Household Youth Data File (Catalog Number 77550)

NHANES III Examination Data File (Catalog Number 76200)

NHANES III Laboratory Data File (Catalog Number 76300)

NHANES III Dietary Recall Data Files (Catalog Number 76700)

A table showing the location of the interview and examination components in the five NHANES III public release data files follows.

Location of the interview and examination components in the five NHANES III public release data files

Topic	Data File				
	HA	HY	EXAM	LAB	DIET
Sample weights	X	X	X	X	.
Age/race/sex	X	X	X	X	.
Ethnic background	X	X	.	.	.
Household composition	X	X	.	.	.
Individual characteristics	X	X	.	.	.
Health insurance	X	X	.	.	.
Family background	X	X	.	.	.
Occupation of family head	X	X	.	.	.
Housing characteristics	X	X	.	.	.
Family characteristics	X	X	.	.	.
Orientation	X	X	.	.	.
Health services	X	X	.	.	.
Selected health conditions	X	X	X	.	.
Diabetes questions	X	.	.	.	.
High blood pressure and cholesterol questions	X	.	.	.	.
Cardiovascular disease questions	X	.	.	.	.
Musculoskeletal conditions	X	.	.	.	.
Physical functioning questions	X	.	.	.	.
Gallbladder disease questions	X	.	.	.	.

Location of the interview and examination components in the five NHANES III public release data files (continued)

Topic	Data File				
	HA	HY	EXAM	LAB	DIET
Kidney conditions	X	.	.	.	.
Respiratory and allergy questions	X	X	.	.	.
Diet questions	X	.	.	.	.
Food frequency	X	.	X	.	.
Vision questions	X	X	.	.	.
Hearing questions	X	X	.	.	.
Dental care and status	X	X	.	.	.
Tobacco	X	.	X	.	.
Occupation	X	.	.	.	.
Language usage	X	X	.	.	.
Exercise	X	.	.	.	.
Social support/residence	X	.	.	.	.
Vitamin/mineral/medicine usage	X	X	X	.	.
Blood pressure measurement	X	.	X	.	.
Birth	.	X	X	.	.
Infant feeding practices/diet	.	X	.	.	.
Motor and social development	.	X	.	.	.
Functional impairment	X	X	.	.	.
School attendance	.	X	.	.	.
Cognitive function	.	X	X	.	.

Location of the interview and examination components in the five NHANES III public release data files (continued)

Topic	Data File				
	HA	HY	EXAM	LAB	DIET
Alcohol and drug use	.	.	X	.	.
Reproductive health	.	.	X	.	.
Diagnostic interview schedule	.	.	X	.	.
Activity	.	.	X	.	.
Physician's examination	.	.	X	.	.
Height and weight	.	.	X	.	.
Body measurements	.	.	X	.	.
Dental examination	.	.	X	.	.
Allergy skin test	.	.	X	.	.
Audiometry	.	.	X	.	.
Tympanometry	.	.	X	.	.
WISC and WRAT	.	.	X	.	.
Spirometry	.	.	X	.	.
Bone densitometry	.	.	X	.	.
Gallbladder ultrasonography	.	.	X	.	.
Central nervous system function evaluation	.	.	X	.	.
Fundus photography	.	.	X	.	.
Physical function evaluation	.	.	X	.	.
Fasting questions	.	.	.	X	.

Location of the interview and examination components in the five NHANES III public release data files (continued)

Topic	Data File				
	HA	HY	EXAM	LAB	DIET
Laboratory tests on blood and urine	.	.	.	X	.
Total nutrient intakes	.	.	X	.	.
Individual foods	.	.	.	.	X
Combination foods	.	.	.	.	X
Ingredients	.	.	.	.	X

Data File Definitions

HA - Household Adult Data File
HY - Household Youth Data File
EXAM - Examination Data File
LAB - Laboratory Data File
DIET - Dietary Recall Data Files

This document includes the documentation for the NHANES III Laboratory Data File and also contains a general overview of the survey and the use of the data files. The general overview includes five sections. The first section, entitled "Guidelines for Data Users," contains important information about the use of the data files. The second section, "Survey Description," is a brief overview of the survey plan and operation. The third section, "Sample Design and Analysis Guidelines," describes some technical aspects of the sampling plan and discusses some analytic issues particularly related to the use of data from complex sample surveys. The "Data Preparation and Processing Procedures" section describes the editing conventions and the codes used to represent the data. The last and fifth section, "General References," includes a reference list for the survey overview sections of the document.

Public Use Data Files for the third National Health and Nutrition Examination Survey will also be available from the National Technical Information Service (NTIS). A list of NCHS public use data tapes available for purchase from NTIS may be obtained from the Data Dissemination Branch at NCHS. Information regarding a bibliography (on disk) of journal articles citing data from all the NHANES and the availability of NHANES III data in CD-ROM/SETS software format can be obtained from the Data Dissemination Branch(301-436-8500) or by writing to:

Data Dissemination Branch
National Center for Health Statistics
Room 1018
6525 Belcrest Road
Hyattsville, Maryland 20782

NTIS can be contacted at:

NTIS - Computer Products Office
5285 Port Royal Road
Springfield, Virginia 22161
(703) 487-4807

Copies of all NHANES III questionnaires and data collection forms are included in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94 (NCHS, 1994; U.S. DHHS, 1996). This publication, along with detailed information on NHANES procedures, interviewing, data collection, quality control techniques, survey design, nonresponse, and sample weighting can be found on the NHANES III Reference Manuals and Reports CD-ROM (U.S. DHHS, 1996). Information on how to order this CD-ROM is available from the Data Dissemination Branch at NCHS at the address and telephone number given above.

GUIDELINES FOR DATA USERS

Please refer to the following important information before analyzing data.

NHANES III Background Documents

- The Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94, (NCHS, 1994; U.S. DHHS, 1996) provides an overview of the survey and includes copies of the survey forms.

- The sample design, nonresponse, and analytic guidelines documents on the NHANES III Reference Manuals and Reports CD-ROM (U.S. DHHS, 1996) discuss the reasons that sample weights and the complex survey design should be taken into account when conducting any analysis.

- Instruction manuals, laboratory procedures, and other NHANES III reference manuals on the NHANES III Reference Manuals and Reports CD-ROM(U.S. DHHS, 1996) are also available for further information on the details of the survey.

Analytic Data Set Preparation

- Most NHANES III survey design and demographic variables are found only on the Adult and Youth Household Data Files. In preparing a data set for analysis, other data files must be merged with either or both of these files to obtain many important analytic variables.

- All of the NHANES III public use data files are linked with the common survey participant identification number (SEQN). Merging information from multiple NHANES III data files using this variable ensures that the appropriate information for each survey participant is linked correctly.

- NHANES III public use data files do not have the same number of records on each file. The Household Questionnaire Files (divided into two files, Adult and Youth) contain more records than the Examination Data File because not everyone who was interviewed completed the examination. The Laboratory Data File contains data only for persons aged one year and older. The Individual Foods Data File based on the dietary recall has multiple records for each person rather than the one record per sample person contained in the other data files.

- For each data file, SAS program code with standard variable names and labels is provided as separate text files on the CD-ROM that contains the data files. This SAS program code can be used to create a SAS data set from the data file.

- Modifications were made to items in the questionnaires, laboratory, and examination components over the course of the survey; as a result, data may not be available for certain variables for the full six years. In addition, variables may differ by phase since some changes were implemented between phases. Users are encouraged to read the Notes sections of this document carefully for information about changes.

- Extremely high and low values have been verified whenever possible, and numerous consistency checks have been performed. Nonetheless, users should examine the range and frequency of values before analyzing data.

- Some data were not ready for release at the time of this publication due to continued processing of the data or analysis of laboratory specimens. A listing of those data are available in the general information section of each data file.

- Confidential and administrative data are not being released to the public. Additionally, some variables have been recoded to help protect the confidentiality of the survey participants. For example, all age-related variables were recoded to 90+ years for persons who were 90 years of age and older.

- Some variable names may differ from those used in the Phase 1 NHANES III Provisional Data Release and some variables included in the Phase 1 provisional release may not appear on these files.

- Although the data files have been edited carefully, errors may be detected. Please notify NCHS staff (301-436-8500) of any errors in the data file or the documentation.

Analytic Considerations

- NHANES III (1988-94) was designed so that the survey's first three years, 1988-91, its last three years, 1991-94, and the entire six years were national probability samples. Analysts are encouraged to use all six years of survey results.

- Sample weights are available for analyzing NHANES III data. One of the following three sample weights will be appropriate for nearly all analyses: interviewed sample final weight (WTPFQX6), examined sample final weight (WTPFEX6), and mobile examination center (MEC)- and home-examined sample final weight (WTPFHX6). Choosing which of these sample weights to use in any analysis depends on the variables being used. A good rule of thumb is to use "the least common denominator" approach. In this approach, the user checks the variables of interest. The variable that was collected on the smallest number of persons is the "least common denominator," and the sample weight that applies to that variable is the appropriate one to use for that analysis. For more detailed information, see the Analytic and Reporting Guidelines for NHANES III (U.S. DHHS, 1996).

Referencing or Citing NHANES III Data

- In publications, please acknowledge NCHS as the original data source. For instance, the reference for the NHANES III Laboratory Data File is:

  U.S. Department of Health and Human Services (DHHS). National Center

for Health Statistics. Third National Health and Nutrition Examination Survey, 1988-1994, NHANES III Laboratory Data File (CD-ROM). Public Use Data File Documentation Number 76200. Hyattsville, MD.: Centers for Disease Control and Prevention, 1996. Available from National Technical Information Service (NTIS), Springfield, VA. Acrobat. PDF format; includes access software: Adobe Systems, Inc. Acrobat Reader 2.1.

- Please place the acronym "NHANES III" in the titles or abstracts of journal articles and other publications in order to facilitate the retrieval of such materials in bibliographic searches.

SURVEY DESCRIPTION

The third National Health and Nutrition Examination Survey (NHANES III) was the seventh in a series of large health examination surveys conducted in the United States beginning in 1960. Three of these surveys, the National Health Examination Surveys (NHES), were conducted in the 1960's (NCHS, 1965; NCHS, 1967; NCHS, 1969). In 1970, an expanded nutrition component was added to provide data with which to assess nutritional status and dietary practices, and the name was changed to the National Health and Nutrition Examination Survey (Miller, 1973; Engel, 1978; McDowell, 1981). A special survey of Hispanic populations in the United States was conducted during 1982-1984 (NCHS, 1985).

The general structure of the NHANES III sample design was similar to that of the previous NHANES. All of the surveys used complex, multi-stage, stratified, clustered samples of civilian, noninstitutionalized populations. NHANES III was the first NHANES without an upper age limit; in fact, the age range for the survey was two months and older. A home examination option was employed for the first time in order to obtain examination data for very young children and for elderly persons who were unable to visit the mobile examination center (MEC). The home examination included only a subset of the components used in the full MEC examination since it would have been difficult to collect some types of data in a home setting. A detailed description of design specifications and copies of the data collection forms can be found in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-1994 (NCHS, 1994; U.S. DHHS, 1996).

NHANES III was conducted from October 1988 through October 1994 in two phases, each of which comprised a national probability sample. The first phase was conducted from October 18, 1988, through October 24, 1991, at 44 locations. The second phase was conducted from September 20, 1991, through October 15, 1994, at 45 different locations. In NHANES III, 39,695 persons were selected over the six years; of those, 33,994 (86%) were interviewed in their homes. All interviewed persons were invited to the MEC for a medical examination. Seventy-eight percent (30,818) of the selected persons were examined in the MEC, and an additional 493 persons were given a special, limited examination in their homes.

Data collection began with a household interview. Several questionnaires were administered in the household: Household Screener Questionnaire, Family Questionnaire, Household Adult Questionnaire, and Household Youth Questionnaire.

At the MEC, an examination was performed, and five automated questionnaires or interviews were administered: MEC Adult Questionnaire, MEC Youth Questionnaire, MEC Proxy Questionnaire, 24-Hour Dietary Recall, and Dietary Food Frequency (ages 12-16 years). The health examination component included a variety of tests and procedures. The examinee's age at the time of the interview and other factors determined which procedures were administered. Blood and urine specimens were obtained, and a number of tests and measurements were performed including body measurements, spirometry, fundus photography, x-rays, electrocardiography, allergy and glucose tolerance tests, and ultrasonography. Measurements were taken of bone density, hearing, and physical, cognitive, and central nervous system functions. A physician performed a limited standardized medical examination

and a dentist performed a standardized dental examination. While some of the blood and urine analyses were performed in the MEC laboratory, most analyses were conducted elsewhere by contract laboratories.

A home examination was conducted for those sample persons aged 2-11 months and aged 20 years or older who were unable to visit the mobile examination center. The home examination consisted of an abbreviated version of the tests and interviews performed in the MEC. Depending on age of the sample person, the components included body measurements, blood pressure, spirometry, venipuncture, physical function evaluation, and a questionnaire to inquire about infant feeding, selected health conditions, cognitive function, tobacco use, and reproductive history.

SAMPLE DESIGN AND ANALYSIS GUIDELINES

Sample Design

The general structure of the NHANES III sample design is the same as that of the previous NHANES. Each of these surveys used a stratified, multi-stage probability design. The major design parameters of the two previous NHANES and the special Hispanic HANES, as well as NHANES III, have been previously summarized (Miller, 1973; McDowell, 1981; NCHS, 1985; NCHS, 1994). The NHANES III sample was designed to be self-weighting within a primary sampling unit (PSU) for subdomains (age, sex, and race-ethnic groups). While the sample was fairly close to self-weighting nationally for each of these subdomain groups, it was not representative of the total population, which includes institutionalized, non-civilian persons that were outside the scope of the survey.

The NHANES III sample represented the total civilian, noninstitutionalized population, two months of age or over, in the 50 states and the District of Columbia of the United States. The first stage of the design consisted of selecting a sample of 81 PSU's that were mostly individual counties. In a few cases, adjacent counties were combined to keep PSU's above a minimum population size. The PSU's were stratified and selected with probability proportional to size (PPS). Thirteen large counties (strata) were chosen with certainty (probability of one). For operational reasons, these 13 certainty PSU's were divided into 21 survey locations. After the 13 certainty strata were designated, the remaining PSU's in the United States were grouped into 34 strata, and two PSU's were selected per stratum (68 survey locations). The selection was done with PPS and without replacement. The NHANES III sample therefore consists of 81 PSU's or 89 locations.

The 89 locations were randomly divided into two groups, one for each phase. The first group consisted of 44 and the other of 45 locations. One set of PSU's was allocated to the first three-year survey period (1988-91) and the other set to the second three-year period (1991-94). Therefore, unbiased estimates (from the point of view of sample selection) of health and nutrition characteristics can be independently produced for both Phase 1 and Phase 2 as well as for both phases combined.

For most of the sample, the second stage of the design consisted of area segments composed of city or suburban blocks, combinations of blocks, or other area segments in places where block statistics were not produced in the 1980 Census. In the first phase of NHANES III, the area segments were used only for a sample of persons who lived in housing units built before 1980. For units built in 1980 and later, the second stage consisted of sets of addresses selected from building permits issued in 1980 or later. These are referred to as "new construction segments." In the second phase, 1990 Census data and maps were used to define the area segments. Because the second phase followed within a few years of the 1990 Census, new construction did not account for a significant part of the sample, and the entire sample came from the area segments.

The third stage of sample selection consisted of households and certain types of group quarters, such as dormitories. All households and eligible

group quarters in the sample segments were listed, and a subsample was designated for screening to identify potential sample persons. The subsampling rates enabled production of a national, approximately equal-probability sample of households in most of the United States with higher rates for the geographic strata with high Mexican-American populations. Within each geographic stratum, there was a nearly equal-probability sample of households across all 89 stands.

Persons within the sample of households or group quarters were the fourth stage of sample selection. All eligible members within a household were listed, and a subsample of individuals was selected based on sex, age, and race or ethnicity. The definitions of the sex, age, race or ethnic classes, subsampling rates, and designation of potential sample persons within screened households were developed to provide approximately self-weighting samples for each subdomain within geographic strata and at the same time to maximize the average number of sample persons per sample household. Previous NHANES indicated that this increased the overall participation rate. Although the exact sample sizes were not known until data collection was completed, estimates were made. Below is a summary of the sample sizes for the full six-year NHANES III at each stage of selection:

Number of PSU's	81
Number of stands (survey locations)	89
Number of segments	2,144
Number of households screened	93,653
Number of households with sample persons	19,528
Number of designated sample persons	39,695
Number of interviewed sample persons	33,994
Number of MEC-examined sample persons	30,818
Number of home-examined sample persons	493

More detailed information on the sample design and weighting and estimation procedures for NHANES III can be found in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94 (NCHS, 1994; U.S. DHHS, 1996) and in the Analytic and Reporting Guidelines: Third National Health and Nutrition Examination Survey (NHANES III), 1988-94 (U.S. DHHS, 1996).

Analysis Guidelines

Because of the complex survey design used in NHANES III, traditional methods of statistical analysis based on the assumption of a simple random sample are not applicable. Detailed descriptions of this issue and possible analytic methods for analyzing NHANES data have been described earlier (NCHS, 1985; Yetley, 1987; Landis, 1982; Delgado, 1990). Recent analytic and reporting guidelines that should be used for most NHANES III analyses and publications are contained in Analytic and Reporting Guidelines (U.S. DHHS, 1996). These recommendations differ slightly from those used by analysts for previous NHANES surveys. These suggested guidelines provide a framework to users for producing estimates that conform to the analytic design of the survey. All users are strongly urged to review these analytic and reporting guidelines before beginning any analyses of NHANES III data.

It is important to remember that this set of statistical guidelines is not absolute. When conducting analyses, the analyst needs to use his/her subject matter knowledge (including methodological issues) as well as information about the survey design. The more one deviates from the original analytic categories defined in the sample design, the more important it is to evaluate the results carefully and to interpret the findings cautiously.

In NHANES III, 89 survey locations were randomly divided into two sets or phases, the first consisting of 44 and the other of 45 locations. One set of PSU's was allocated to the first three-year survey period (1988-91) and the other set to the second three-year period (1991-94). Therefore, unbiased national estimates of health and nutrition characteristics can be independently produced for each phase as well as for both phases combined. Computation of national estimates from both phases combined (i.e., total NHANES III) is the preferred option; individual phase estimates may be highly variable. In addition, individual phase estimates are not statistically independent. It is also difficult to evaluate whether differences in individual phase estimates are real or due to methodological differences. That is, differences may be due to changes in sampling methods or data collection methodology over time. At this time, there is no valid statistical test for examining differences between Phase 1 and Phase 2. Therefore, although point estimates can be produced separately for each phase, no test is available to test whether those estimates are significantly different from each other.

NHANES III is based on a complex, multi-stage probability sample design. Several aspects of the NHANES design must be taken into account in data analysis, including the sample weights and the complex survey design. Appropriate sample weights are needed to estimate prevalence, means, medians, and other statistics. Sample weights are used to produce correct population estimates because each sample person does not have the same probability of selection. The sample weights incorporate the differential probabilities of selection and include adjustments for noncoverage and nonresponse. A detailed discussion of nonresponse adjustments and issues related to survey coverage have been published (U.S. DHHS, 1996). With the large oversampling of young children, older persons, black persons, and Mexican-Americans in NHANES III, it is essential that the sample weights be used in all analyses. Otherwise, a misinterpretation of results is highly likely. Other aspects of the design that must be taken into account in data analyses are the strata and PSU pairings from the sample design. These pairings should be used to estimate variances and test for statistical significance. For weighted analyses, analysts can use special computer software packages that use an appropriate method for estimating variances for complex samples such as SUDAAN (Shah, 1995) and WesVarPC (Westat, 1996).

Although initial exploratory analyses may be performed on unweighted data using standard statistical packages and assuming simple random sampling, final analyses should be done on weighted data using appropriate sample weights. A summary of the weighting methodology and the type of sample weights developed for NHANES III is included in Weighting and Estimation Methodology (U.S. DHHS, 1996).

The purpose of weighting the sample data is to permit analysts to produce estimates of statistics that would have been obtained if the entire sampling frame (the United States) had been surveyed. Sample weights can be considered as measures of the number of persons the particular sample

observation represents. Weighting takes into account several features of the survey: the specific probabilities of selection for the individual domains that were oversampled as well as nonresponse and differences between the sample and the total U.S. population. Differences between the sample and the population may arise due to sampling variability, differential undercoverage in the survey among demographic groups, and possibly other types of response errors, such as differential response rates or misclassification errors. Sample weighting in NHANES III was used to:

1. Compensate for differential probabilities of selection among subgroups (i.e., age-sex-race-ethnicity subdomains where persons living in different geographic strata were sampled at different rates);
2. Reduce biases arising from the fact that nonrespondents may be different from those who participate;
3. Bring sample data up to the dimensions of the target population totals;
4. Compensate, to the extent possible, for inadequacies in the sampling frame (resulting from omissions of some housing units in the listing of area segments, omissions of persons with no fixed address, etc.); and
5. To reduce variances in the estimation procedure by using auxiliary information that is known with a high degree of accuracy.

In NHANES III, the sample weighting was carried out in three stages. The first stage involved the computation of weights to compensate for unequal probabilities of selection (objective 1, above). The second stage adjusted for nonresponse (objective 2). The third stage used poststratification of the sample weights to Census Bureau estimates of the U.S. population to accomplish the third, fourth, and fifth objectives simultaneously. In NHANES III, several types of sample weights (see the sample weights table that follows) were computed for the interviewed and examined sample and are included in the NHANES III data file. Also, sample weights were computed separately for Phase 1 (1988-91), Phase 2 (1991-94), and total NHANES III (1988-94) to facilitate analysis of items collected only in Phase 1, only in Phase 2, and over six years of the survey. Three sets of pseudo strata and PSU pairings are provided to use with SUDAAN in variance estimation. Since NHANES III is based on a complex, multi-stage sample design, appropriate sample weights should be used in analyses to produce national estimates of prevalence and associated variances while accounting for unequal probability of selection of sample persons. For example, the final interview weight, WTPFQX6, should be used for analysis of the items or questions from the family or household questionnaires, and the final MEC examination weight, WTPFEX6, should be used for analysis of the questionnaires and measurements administered in the MEC. Furthermore, for a combined analysis of measurements from the MEC examinations and associated medical history questions from the household interview, the final MEC examination weight, WTPFEX6, should be used. We recommend using SUDAAN (Shah, 1995) to estimate statistics of interest and the associated variance. However, one can also use other published methods for variance estimation. Application of SUDAAN and alternative methods, such as the average design effect approach, balance repeated replication (BRR) methods, or jackknife methods for variance estimation, are discussed in Weighting and Estimation Methodology (U.S. DHHS, 1996).

Appropriate Uses of the NHANES III Sample Weights

Final interview weight, WTPFQX6

Use only in conjunction with the sample interviewed at home and with items collected during the household interview.

Final examination (MEC only) weight, WTPFEX6

Use only in conjunction with the MEC-examined sample and with interview and examination items collected at the MEC.

Final MEC+home examination weight, WTPFHX6

Use only in conjunction with the MEC+home-examined sample and with items collected at both the MEC and home.

Final allergy weight, WTPFALG6

Use only in conjunction with the allergy subsample and with items collected as part of the allergy component of the exam.

Final CNS weight, WTPFCNS6

Use only in conjunction with the CNS subsample and with items collected as part of the CNS component of the exam.

Final morning examination (MEC only) subsample weight, WTPFSD6

Use only in conjunction with the MEC-examined persons assigned to the morning subsample and only with items collected in the MEC exam.

Final afternoon/evening examination (MEC only) subsample weight, WTPFMD6

Use only in conjunction with the MEC-examined persons assigned to the afternoon/evening subsample and only with items collected in the MEC exam.

Final morning examination (MEC+home) subsample weight, WTPFHSD6

Use only in conjunction with the MEC- and home-examined persons assigned to the morning subsample and with items collected during the MEC and home examinations.

Final afternoon/evening examination (MEC+home) weight, WTPFHMD6

Use only in conjunction with the MEC- and home-examined persons assigned to the afternoon/evening subsample and with items collected during the MEC and home examinations.

DATA PREPARATION AND PROCESSING PROCEDURES

Automated data collection procedures for the survey were introduced in NHANES III. In the mobile examination centers, data for the interview and examination components were recorded directly onto a computerized data collection form. With the exception of a few independently automated systems, the system was centrally integrated. This operation allowed for ongoing monitoring of much of the data. Before the introduction of the computer-assisted personal interview (CAPI), the household questionnaire data were reviewed manually by field editors and interviewers. CAPI (1992-1994 only) questionnaires featured built-in edits to prevent entering inconsistencies and out-of-range responses. The multi-level data collection and quality control systems are discussed in detail in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-1994 (NCHS, 1994; U.S. DHHS, 1996). All interview, laboratory, and examination data were sent to NCHS for final processing.

Guidelines were developed that provided standards for naming variables, filling missing values and coding conventional responses, handling missing records, and standardizing two-part quantity/unit questionnaire variables. NCHS staff, assisted by contract staff, developed data editing specifications that checked data sets for valid codes, ranges, and skip pattern consistencies and examined the consistency of values between interrelated variables. Comments, collected in both interviews and examination components, were reviewed and recoded when possible. Responses to "Other" and "Specify" were recoded either to existing code categories or to new categories. The documentation for each data set includes notes for those variables that have been recoded and standardized and for those variables that differ significantly from what appears in the original data collection instrument. While the data have undergone many quality control and editing procedures, there still may be values that appear extreme or illogical. Values that varied considerably from what was expected were examined by analysts who checked for comments or other responses that might help to clarify unusual values. Generally, values were retained unless they could not possibly be true, in which case they were changed to "Blank but applicable." Therefore, the user must review each data set for extreme or inconsistent values and determine the status of each value for analysis.

Several editing conventions were used in the creation of final analytic data sets:

1. Standardized variables were created to replace all two-part quantity/unit questions using standard conversion factors. Standardized variables have the same name as the variable of the two-part question with an "S" suffix. For instance, MAPF18S (Months received WIC benefits) in the MEC Adult Questionnaire was created from the two-part response option to question F18, "How long did you receive benefits from the WIC program?," using the conversion factor 12 months per year.

2. Recoded variables were created by combining responses from two or more like variables, or by collapsing responses to create a summary variable for the purpose of confidentiality. Recoded variables have the original variable name with an R suffix. For example, place of birth variable (HFA6X) in the Family Questionnaire was collapsed to a three level response category (U.S., Mexico, Other) and renamed HFA6XR. Generally, only the recoded variable has been included in the data file.

3. Fill values, a series of one or more digits, were used to represent certain specific conditions or responses. Below is a list of the fill values that were employed. Some of the fill values pertain only to questionnaire data, although 8-fill and blank-fill values are found in all data sets. Other fill values, not included in this list, are used to represent component-specific conditions.

   6-fills = Varies/varied. (Questionnaires only)

   7-fills = Fewer than the smallest number that could be reported within the question structure (e.g., fewer than one cigarette per day). (Questionnaires only)

   8-fills = Blank but applicable/cannot be determined. This means that a respondent was eligible to receive the question, test, or component but did not because of refusal, lack of time, lack of staff, loss of data, broken vial, language barrier, unreliability, or other similar reasons.

   9-fills = Don't know. This fill was used only when a respondent did not know the response to a question and said, "I don't know." (Questionnaires only)

   Blank fills = Inapplicable. If a respondent was not eligible for a questionnaire, test, or component because of age, gender, or specific reason, the variable was blank-filled. In the questionnaire, if a respondent was not asked a question because of a skip-pattern, variables corresponding to the question were blank-filled. For examination or laboratory components, if a person was excluded by a defined protocol (e.g., screening exclusion questions) and these criteria are included in the data set, then the corresponding variables were blank-filled for that person. For home examinees, variables for examination components and blood tests not performed as part of the home examination protocol were blank-filled.

4. For variables describing discrete data, codes of zero (0) were used to mean "none," "never," or the equivalent. Value labels for which "0" is used include: "has not had," "never regularly," "still taking," or "never stopped using." Unless otherwise labeled, for variables containing continuous data, "zero" means "zero.

5. Where there are logical skip patterns in the flow of the questionnaire or examination component, the skip was indicated by placing the variable label of the skip destination in parentheses as part of the value label of the response generating the skip. For example, in the Physical Function Evaluation, the variable PFPWC (in wheelchair) has a value label, "2 No (PFPSCOOT)" that means that the next item for persons not in a wheelchair would be represented by the variable, PFPSCOOT.

Variable Nomenclature

A unique name was assigned to every NHANES III variable using a standard convention. By following this naming convention, the origin of each variable is clear, and there is no chance of overlaying similar variables across multiple components. Variables range in length from three to eight characters. The first two variable characters represent the topic (e.g., analyte, questionnaire instrument, examination component) and are listed below alphabetically by topic. For questionnaires administered in the household, the remainder of the variable name following the first two

characters indicates the question section and number. For example, data for the response to the Household Adult Questionnaire question B1 are contained in the variable HAB1. For most laboratory and examination variables, as well as some other variables, a "P" in the third position refers to "primary" and the remainder of the variable name is a brief description of the item. For instance, in the Laboratory Data File, information on the length of time the person fasted before the first blood draw is contained in the variable PHPFAST. The variable PHPFAST was derived as follows: characters 1-2 (PH) refer to "phlebotomy," character 3 (P) refers to "primary," characters 4-8 (FAST) refer to an abbreviation for "fasting."

CODE	TOPIC
AT	Alanine aminotransferase (from biochemistry profile)
AM	Albumin (from biochemistry profile)
AP	Alkaline phosphatase (from biochemistry profile)
AL	Allergy skin test
AC	Alpha carotene
AN	Anisocytosis
AA	Apolipoprotein (AI)
AB	Apolipoprotein (B)
AS	Aspartate aminotransferase (from biochemistry profile)
LA	Atypical lymphocyte
AU	Audiometry
BA	Band
BO	Basophil
BS	Basophilic stippling
BC	Beta carotene
BX	Beta cryptoxanthin
BL	Blast
BU	Blood urea nitrogen (BUN) (from biochemistry profile)
BM	Body measurements
BD	Bone densitometry
C1	C-peptide (first venipuncture)
C2	C-peptide (second venipuncture)
CR	C-reactive protein
UD	Cadmium
CN	Central nervous system function evaluation
CL	Chloride (from biochemistry profile)
CO	Cotinine
CE	Creatinine (serum)(from biochemistry profile)

CODE	TOPIC
UR	Creatinine (urine)
DM	Demographic
DE	Dental examination
MQ	Diagnostic interview schedule
DR	Dietary recall (total nutrient intakes)
EO	Eosinophil
EP	Erythrocyte protoporphyrin
FR	Ferritin
FB	Fibrinogen
RB	Folate (RBC)
FO	Folate (serum)
FH	Follicle stimulating hormone (FSH)
FP	Fundus photography
GG	Gamma glutamyl transferase (GGT) (from biochemistry profile)
GU	Gallbladder ultrasonography
GB	Globulin (from biochemistry profile)
G1	Glucose (first venipuncture)
G2	Glucose (second venipuncture)
SG	Glucose (from biochemistry profile)
GH	Glycated hemoglobin
GR	Granulocyte
C3	HCO3 (Bicarbonate)(from biochemistry profile)
HD	HDL cholesterol
HP	Helicobacter pylori antibody
HT	Hematocrit
HG	Hemoglobin
AH	Hepatitis A antibody (HAV)
HB	Hepatitis B core antibody (anti-HBc)
SS	Hepatitis B surface antibody (anti-HBs)
SA	Hepatitis B surface antigen (HBsAg)
HC	Hepatitis C antibody (HCV)
DH	Hepatitis D antibody (HDV)
H1	Herpes 1 antibody
H2	Herpes 2 antibody
HX	Home examination (general)
HF	Household family questionnaire
HA	Household adult questionnaire
HQ	Household questionnaire variables (composite)
HS	Household screener questionnaire
HY	Household youth questionnaire
HZ	Hypochromia
I1	Insulin (first venipuncture)
I2	Insulin (second venipuncture)
UI	Iodine (urine)
FE	Iron
SF	Iron (from biochemistry profile)
LD	Lactate dehydrogenase (from biochemistry profile)
L1	Latex antibody
LC	LDL cholesterol (calculated)
PB	Lead
LP	Lipoprotein (a)
LH	Luteinizing hormone

CODE	TOPIC
LU	Lutein/zeaxanthin
LY	Lycopene
LM	Lymphocyte
MR	Macrocyte
MC	Mean cell hemoglobin (MCH)
MH	Mean cell hemoglobin concentration (MCHC)
MV	Mean cell volume (MCV)
PV	Mean platelet volume
MA	MEC adult questionnaire
MX	MEC examination (general)
FF	Dietary food frequency (ages 12-16 years)
MP	MEC proxy questionnaire
MY	MEC youth questionnaire
ME	Metamyelocyte
MI	Microcyte
MO	Monocyte
MN	Mononuclear cell
ML	Myelocyte
IC	Normalized calcium (derived from ionized calcium)
OS	Osmolality (from biochemistry profile)
PH	Phlebotomy data collected in MEC (e.g., questions)
PS	Phosphorus (from biochemistry profile)
PF	Physical function evaluation
PE	Physician's examination
PL	Platelet
DW	Platelet distribution width
PK	Poikilocytosis
PO	Polychromatophilia
SK	Potassium (from biochemistry profile)
PR	Promyelocyte
RC	Red blood cell count (RBC)
RW	Red cell distribution width (RDW)
RE	Retinyl esters
RF	Rheumatoid factor antibody
RU	Rubella antibody
WT	Sample weights
SE	Selenium
SI	Sickle cell
NA	Sodium (from biochemistry profile)
SH	Spherocyte
SP	Spirometry
SD	Survey design
TT	Target cell
TE	Tetanus
TB	Total bilirubin (from biochemistry profile)
CA	Total calcium
SC	Total calcium (from biochemistry profile)
TC	Total cholesterol
CH	Total cholesterol (from biochemistry profile)
TI	Total iron binding capacity (TIBC)
TP	Total protein (from biochemistry profile)
TX	Toxic granulation
TO	Toxoplasmosis antibody
PX	Transferrin saturation

CODE	TOPIC
TG	Triglycerides
TR	Triglycerides (from biochemistry profile)
TY	Tympanometry
UA	Uric acid (from biochemistry profile)
UB	Urinary albumin
VU	Vacuolated cells
VR	Varicella antibody
VA	Vitamin A
VB	Vitamin B12
VC	Vitamin C
VE	Vitamin E
WC	White blood cell count (WBC)
WW	WISC/WRAT cognitive test

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NHANES III LABORATORY DATA FILE

General Information

Introduction

The Laboratory Data File contains data from the urine collection and venipuncture components of the examination, including almost all laboratory test results (blood and urine) available to date. The exceptions are discussed elsewhere in this documentation. In addition, auxiliary information such as how long the examinee fasted, the time of day of the venipuncture, and the conditions precluding venipuncture has been included. This documentation presents information that should be reviewed before proceeding with data analysis.

The documentation pertaining specifically to the Laboratory Data File is divided into four main sections. The first section, "General Information," provides information about the contents of the Laboratory Data File. The second section, "Data File Index," includes a brief description of all the variables on the data set and shows the standard name of each variable and its position in the data set. The third section, "Item Descriptions, Codes, Counts, and Notes" provides for each component a description, the standard variable name and a brief description of the values that variable can take on, a count of the frequency of occurrence of each value, notes by variable, and appendices as necessary. "References" are provided in the fourth section.

Blood and urine specimens were collected on examinees aged one year and older at the mobile examination center (MEC).For those examinees aged one year and older who did not travel to the MEC, only blood specimens were collected during the Home Examination (HE). Hematologic profiles were completed for all examinees, and specified laboratory tests were performed upon each specimen based on the examinee's age and sex. Only a limited number of tests were performed on specimens collected during the Home Examination. Appendix 1 lists the laboratory tests by specimen type, age group, sex, and whether the specimen was collected in the Home Examination.

The analysis of NHANES III laboratory data must be conducted with the key survey design and basic demographic variables. The NHANES III Household Youth Questionnaire Data File (ages two months to 16 years) and the NHANES III Household Adult Questionnaire Data File (ages 17 years and older) 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. These two household questionnaire files may be linked to the laboratory data file using the unique survey participant (sample person) identifier SEQN.

Examinee Screening

Prior to the phlebotomy (venipuncture), a questionnaire was administered to determine an examinee's eligibility for all phlebotomy procedures (including venipuncture and the oral glucose tolerance test). It included questions to determine if it was safe to perform the venipuncture, to document and determine fasting compliance, and to aid in analyzing the results of the laboratory tests performed. Examinees reporting hemophilia or

recent cancer chemotherapy treatment were excluded from the venipuncture. For those examinees, the laboratory test results fields for all blood-based laboratory tests were left blank. Because examinees reporting current insulin therapy were excluded from receiving the oral glucose tolerance test (OGTT), the plasma glucose (G2P), serum insulin (I2P) and serum C-peptide (C2P) results from the second venipuncture were left blank as well.

Although examinees aged 12 years and older were instructed to fast for 10-16 hours prior to the morning examination or for six hours before the afternoon or evening examination, the instructions were not followed uniformly. Laboratory test results and the duration of the fast have been included on the data file regardless of the examinee's fasting compliance. Analysts should consider whether fasting status is crucial before undertaking analyses. Examinees who reported insulin use during the household interview were not instructed to fast.

Specimen Collection and Processing Procedures

Detailed specimen collection and processing instructions are discussed in the Manual for Medical Technicians (U.S. DHHS, 1996). Vials were stored under appropriate refrigerated (4-8 degrees Centigrade) or frozen (-20 degrees Centigrade) conditions until they were shipped to analytical laboratories for testing. The analytical methods used by each of the participating laboratories are described in the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996). The manual contains quality control graphs and statistical summary information for each laboratory test at the end of the laboratory method description.

Oral glucose tolerance testing: During NHANES III, the OGTT was conducted on MEC examinees aged 40-74 years. The protocol included two timed venipunctures and a glucose drink. Two glucose drinks were used to measure an examinee's ability to metabolize glucose -- Dextol(TM) and Trutol(TM). After the first venipuncture, the examinee drank the glucose drink, and a second venipuncture was performed approximately two hours later.

Examiner Training and Quality Control

The NHANES III laboratory staff consisted of medical technologists and phlebotomists. The medical technologists held baccalaureates in medical technology. Both they and the phlebotomists were certified by the American Society for Clinical Pathologists or by a similar organization.

All laboratory staff completed comprehensive training in standardized laboratory procedures before they began working in the MEC. The MEC phlebotomists completed comprehensive training in pediatric phlebotomy techniques, including instruction by a pediatric nurse practitioner. Laboratory team performance was monitored using several techniques. NCHS and contract consultants used a structured quality assurance evaluation during unscheduled visits to evaluate both the quality of the laboratory work and the quality-control procedures. Each laboratory staff person was observed for equipment operation, specimen collection and preparation, and testing procedures, and constructive feedback was given to each team. Formal retraining sessions were conducted annually to ensure that required skill levels were maintained.

Laboratory Protocol Changes from 1988 to 1994

Most laboratory tests were performed for the entire six years of NHANES III. Exceptions are detailed below. Apolipoprotein AI and B tests were included during 1988-1991 only. Lipoprotein(a), Vitamin B12, and antibody tests for immunoglobulin E, rubella, varicella, and toxoplasmosis were conducted during 1991-1994. For the 1991-1994 period, the OGTT procedure was modified to add tests for C-peptide and insulin on specimens from the second venipuncture. For statistical analyses of these laboratory test results, the appropriate Phase 1 or Phase 2 sample weight should be used.

Incomplete Data Release

At the time of this data release, some laboratory test results were not available. Tests for which results were unavailable included vitamin D, immunoglobulin E, diphtheria antitoxin, measles antibody, homocysteine, periodontal pathogens, thyroxine, thyroid stimulating hormone, antithyroglobulin antibody, antimicrosomal antibody, and methylmalonic acid. Cotinine test results for 1988-1991 have been included in this laboratory data file. Cotinine testing is still being carried out for 1991-1994, and the laboratory test results will be released at a future date. Results from urine pregnancy tests are included in the NHANES III Examination Data File, rather than in the Laboratory Data File.

Serologic testing for human immunodeficiency virus (HIV) antibody and urine testing for drugs of abuse were performed anonymously. The drugs of abuse for which examinees were tested were cocaine, marijuana, opiates, phencyclidine, and amphetamines. To maintain anonymity, the examinee's serum and urine were labeled with a random identifying number, and limited demographic data were linked to that number. The new identifier was not linked to the original sample identifier. Therefore, these data cannot be linked to other NHANES III data. The HIV test was performed from 1988 through 1994; the urine drug testing was done from 1991 through 1994. Because of the limited analytic potential of the HIV and drug data, this file is not included in this data release.

Data Preparation and Processing

For laboratory tests with a lower detection limit, results below the lower detection limit were replaced with a value equal to the detection limit divided by the square root of two. This value was created to help the user distinguish a nondetectable laboratory test result from a measured laboratory test result. Appendix 2 documents the detection limit for each laboratory test.

The SI unit (le Systeme International d Unites) is an outgrowth of the metric system that has been used throughout most of the world. In addition to providing a uniform international system of units of measurement, a uniform style is prescribed. Laboratory test results not originally reported in SI units were converted to SI units if applicable. Conversion factors, the format of the NHANES and SI results, and NHANES and SI units of measure are in Appendix 3. In converting NHANES III data to SI units, the goal was to preserve the level of detail reported by the laboratories in the original

laboratory test result. Therefore, the number of significant digits in the laboratory test results data may be different from that in published references.

The Laboratory Data File contains laboratory test results for glucose (G1P), triglycerides (TGP), cholesterol (TCP), and iron (FEP) measured by contract laboratories using reference analytic methods. For these methods, consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996). However, the biochemistry profile also included measurements of these analytes. In general, for most analyses, the appropriate variables to use are G1P, TGP, TCP and FEP. The values from the biochemistry profile (SGP, CHP, TRP, SFP) should not be used routinely.

The definition of a reference method by the National Committee for Clinical Laboratory Standards (NCCLS) is "a thoroughly investigated method in which exact and clear descriptions of the necessary conditions and procedures are given for the accurate determination of one or more property values; the documented accuracy and precision of the method are commensurate with the method's use for assessing the accuracy of other methods for measuring the same property values or for assigning reference method values to reference materials" (NCCLS, 1991).

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
DEMOGRAPHIC DATA		
HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)		
Sample person identification number	SEQN	1-5
Family sequence number	DMPFSEQ	6-10
Examination/interview Status	DMPSTAT	11
Race-ethnicity	DMARETHN	12
Race	DMARACER	13
Ethnicity	DMAETHNR	14
Sex	HSSEX	15
Age at interview (Screener)	HSAGEIR	16-17
Age at interview - unit (Screener)	HSAGEU	18
Age in months at interview (screener)	HSAITMOR	19-22
Family size (persons in family)	HSFSIZER	23-24
Household size (persons in dwelling)	HSHSIZER	25-26
County code	DMPCNTYR	27-29
FIPS code for State	DMPFIPSR	30-31
Rural/urban code based on USDA code	DMPMETRO	32
Census region, weighting(Texas in south)	DMPCREGN	33
Poverty Income Ratio (unimputed income)	DMPPIR	34-39
SURVEY DESIGN DATA		
Phase of NHANES III survey	SDPPHASE	40

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Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Total NHANES III pseudo-PSU	SDPPSU6	41
Total NHANES III pseudo-stratum	SDPSTRA6	42-43
Pseudo-PSU for phase 1	SDPPSU1	44
Pseudo-stratum for phase 1	SDPSTRA1	45-46
Pseudo-PSU for phase 2	SDPPSU2	47
Pseudo-stratum for phase 2	SDPSTRA2	48-49
SAMPLING WEIGHTS - TOTAL NHANES III (1988-94)		
Total interviewed sample final weight	WTPFQX6	50-58
Total MEC-examined sample final weight	WTPFEX6	59-67
Total M+H examined sample final weight	WTPFHX6	68-76
Total allergy subsample final weight	WTPFALG6	77-85
Total CNS subsample final weight	WTPFCNS6	86-94
Total morning subsample final wgt	WTPFSD6	95-103
Total afternoon/eve subsample final wgt	WTPFMD6	104-112
Total M+H morning subsample final wgt	WTPFHSD6	113-121
Total M+H afternoon subsample final wgt	WTPFHMD6	122-130
SAMPLING WEIGHTS - NHANES III PHASE 1 (1988-91)		
Phase 1 interviewed sample final wgt	WTPFQX1	131-139
Phase 1 MEC examined sample final wgt	WTPFEX1	140-148
Phase 1 M+H examined sample final wgt	WTPFHX1	149-157
Phase 1 allergy subsample final wgt	WTPFALG1	158-166
Phase 1 CNS subsample final wgt	WTPFCNS1	167-175
Phase 1 morning sess subsample final wgt	WTPFSD1	176-184
Phase 1 aft/eve subsample final wgt	WTPFMD1	185-193
Phase 1 morning M+H subsample final wgt	WTPFHSD1	194-202
Phase 1 aft/eve M+H subsample final wgt	WTPFHMD1	203-211
SAMPLING WEIGHTS - NHANES III PHASE 2 (1991-94)		
Phase 2 interviewed sample final wgt	WTPFQX2	212-220
Phase 2 MEC examined sample final wgt	WTPFEX2	221-229

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Phase 2 M+H examined sample final wgt	WTPFHX2	230-238
Phase 2 allergy subsample final wgt	WTPFALG2	239-247
Phase 2 CNS subsample final wgt	WTPFCNS2	248-256
Phase 2 morning sess subsample final wgt	WTPFSD2	257-265
Phase 2 aft/eve subsample final wgt	WTPFMD2	266-274
Phase 2 morning M+H subsample final wgt	WTPFHSD2	275-283
Phase 2 aft/eve M+H subsample final wgt	WTPFHMD2	284-292
FAY'S BRR REPLICATE INTERVIEW WEIGHTS - TOTAL NHANES III (1988-94)		
Replicate 1 final interview weight	WTPQRP1	293-301
Replicate 2 final interview weight	WTPQRP2	302-310
Replicate 3 final interview weight	WTPQRP3	311-319
Replicate 4 final interview weight	WTPQRP4	320-328
Replicate 5 final interview weight	WTPQRP5	329-337
Replicate 6 final interview weight	WTPQRP6	338-346
Replicate 7 final interview weight	WTPQRP7	347-355
Replicate 8 final interview weight	WTPQRP8	356-364
Replicate 9 final interview weight	WTPQRP9	365-373
Replicate 10 final interview weight	WTPQRP10	374-382
Replicate 11 final interview weight	WTPQRP11	383-391
Replicate 12 final interview weight	WTPQRP12	392-400
Replicate 13 final interview weight	WTPQRP13	401-409
Replicate 14 final interview weight	WTPQRP14	410-418
Replicate 15 final interview weight	WTPQRP15	419-427
Replicate 16 final interview weight	WTPQRP16	428-436
Replicate 17 final interview weight	WTPQRP17	437-445
Replicate 18 final interview weight	WTPQRP18	446-454
Replicate 19 final interview weight	WTPQRP19	455-463
Replicate 20 final interview weight	WTPQRP20	464-472
Replicate 21 final interview weight	WTPQRP21	473-481
Replicate 22 final interview weight	WTPQRP22	482-490
Replicate 23 final interview weight	WTPQRP23	491-499
Replicate 24 final interview weight	WTPQRP24	500-508
Replicate 25 final interview weight	WTPQRP25	509-517
Replicate 26 final interview weight	WTPQRP26	518-526
Replicate 27 final interview weight	WTPQRP27	527-535

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Description	Variable Name	Positions
Replicate 28 final interview weight	WTPQRP28	536-544
Replicate 29 final interview weight	WTPQRP29	545-553
Replicate 30 final interview weight	WTPQRP30	554-562
Replicate 31 final interview weight	WTPQRP31	563-571
Replicate 32 final interview weight	WTPQRP32	572-580
Replicate 33 final interview weight	WTPQRP33	581-589
Replicate 34 final interview weight	WTPQRP34	590-598
Replicate 35 final interview weight	WTPQRP35	599-607
Replicate 36 final interview weight	WTPQRP36	608-616
Replicate 37 final interview weight	WTPQRP37	617-625
Replicate 38 final interview weight	WTPQRP38	626-634
Replicate 39 final interview weight	WTPQRP39	635-643
Replicate 40 final interview weight	WTPQRP40	644-652
Replicate 41 final interview weight	WTPQRP41	653-661
Replicate 42 final interview weight	WTPQRP42	662-670
Replicate 43 final interview weight	WTPQRP43	671-679
Replicate 44 final interview weight	WTPQRP44	680-688
Replicate 45 final interview weight	WTPQRP45	689-697
Replicate 46 final interview weight	WTPQRP46	698-706
Replicate 47 final interview weight	WTPQRP47	707-715
Replicate 48 final interview weight	WTPQRP48	716-724
Replicate 49 final interview weight	WTPQRP49	725-733
Replicate 50 final interview weight	WTPQRP50	734-742
Replicate 51 final interview weight	WTPQRP51	743-751
Replicate 52 final interview weight	WTPQRP52	752-760
FAY'S BRR REPLICATE EXAMINATION WEIGHTS - TOTAL NHANES III (1988-94)		
Replicate 1 final exam weight	WTPXRP1	761-769
Replicate 2 final exam weight	WTPXRP2	770-778
Replicate 3 final exam weight	WTPXRP3	779-787
Replicate 4 final exam weight	WTPXRP4	788-796
Replicate 5 final exam weight	WTPXRP5	797-805
Replicate 6 final exam weight	WTPXRP6	806-814
Replicate 7 final exam weight	WTPXRP7	815-823
Replicate 8 final exam weight	WTPXRP8	824-832
Replicate 9 final exam weight	WTPXRP9	833-841

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Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Replicate 10 final exam weight	WTPXRP10	842-850
Replicate 11 final exam weight	WTPXRP11	851-859
Replicate 12 final exam weight	WTPXRP12	860-868
Replicate 13 final exam weight	WTPXRP13	869-877
Replicate 14 final exam weight	WTPXRP14	878-886
Replicate 15 final exam weight	WTPXRP15	887-895
Replicate 16 final exam weight	WTPXRP16	896-904
Replicate 17 final exam weight	WTPXRP17	905-913
Replicate 18 final exam weight	WTPXRP18	914-922
Replicate 19 final exam weight	WTPXRP19	923-931
Replicate 20 final exam weight	WTPXRP20	932-940
Replicate 21 final exam weight	WTPXRP21	941-949
Replicate 22 final exam weight	WTPXRP22	950-958
Replicate 23 final exam weight	WTPXRP23	959-967
Replicate 24 final exam weight	WTPXRP24	968-976
Replicate 25 final exam weight	WTPXRP25	977-985
Replicate 26 final exam weight	WTPXRP26	986-994
Replicate 27 final exam weight	WTPXRP27	995-1003
Replicate 28 final exam weight	WTPXRP28	1004-1012
Replicate 29 final exam weight	WTPXRP29	1013-1021
Replicate 30 final exam weight	WTPXRP30	1022-1030
Replicate 31 final exam weight	WTPXRP31	1031-1039
Replicate 32 final exam weight	WTPXRP32	1040-1048
Replicate 33 final exam weight	WTPXRP33	1049-1057
Replicate 34 final exam weight	WTPXRP34	1058-1066
Replicate 35 final exam weight	WTPXRP35	1067-1075
Replicate 36 final exam weight	WTPXRP36	1076-1084
Replicate 37 final exam weight	WTPXRP37	1085-1093
Replicate 38 final exam weight	WTPXRP38	1094-1102
Replicate 39 final exam weight	WTPXRP39	1103-1111
Replicate 40 final exam weight	WTPXRP40	1112-1120
Replicate 41 final exam weight	WTPXRP41	1121-1129
Replicate 42 final exam weight	WTPXRP42	1130-1138
Replicate 43 final exam weight	WTPXRP43	1139-1147
Replicate 44 final exam weight	WTPXRP44	1148-1156
Replicate 45 final exam weight	WTPXRP45	1157-1165
Replicate 46 final exam weight	WTPXRP46	1166-1174
Replicate 47 final exam weight	WTPXRP47	1175-1183

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Replicate 48 final exam weight	WTPXRP48	1184-1192
Replicate 49 final exam weight	WTPXRP49	1193-1201
Replicate 50 final exam weight	WTPXRP50	1202-1210
Replicate 51 final exam weight	WTPXRP51	1211-1219
Replicate 52 final exam weight	WTPXRP52	1220-1228
HOUSEHOLD YOUTH QUESTIONNAIRE (HYQ)		
Age in months at youth interview	HYAITMO	1229-1232
MEC EXAMINATION		
Language used by SP in MEC	MXPLANG	1233
Session for MEC examination	MXPSESSR	1234
Day of week of MEC exam	MXPTIDW	1235
Age in months at MEC exam	MXPAXTMR	1236-1239
HOME EXAMINATION		
Day of week of home exam	HXPTIDW	1240
Age in months at home exam	HXPAXTMR	1241-1244
Session for home examination	HXPSESSR	1245
PHLEBOTOMY SCREENING QUESTIONNAIRE		
Language	PHPLANG	1246
Do you have hemophilia?	PHPHEMO	1247
Recent chemo/within the past four weeks	PHPCHM2	1248
Are you currently taking insulin?	PHPINSU	1249
Time participant last ate	PHPSNTI	1250-1254
Day participant last ate	PHPSNDA	1255
Have you had anything to drink?	PHPDRIN	1256
Time participant last drank	PHPDRTI	1257-1261
Day participant last drank	PHPDRDA	1262

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Length of calculated fast (in hours)	PHPFAST	1263-1267
Time of venipuncture	PHPBEST	1268-1272
HEMATOLOGY		
White blood cell count	WCP	1273-1277
White blood cell count: SI	WCPSI	1278-1282
Lymphocyte percent (Coulter)	LMPPCNT	1283-1287
Mononuclear percent (Coulter)	MOPPCNT	1288-1292
Granulocyte percent (Coulter)	GRPPCNT	1293-1297
Lymphocyte number (Coulter)	LMP	1298-1302
Mononuclear number (Coulter)	MOP	1303-1306
Granulocyte number (Coulter)	GRP	1307-1311
Red blood cell count	RCP	1312-1315
Red blood cell count: SI	RCPSI	1316-1319
Hemoglobin (g/dL)	HGP	1320-1324
Hemoglobin: SI (g/L)	HGPSI	1325-1329
Hematocrit (%)	HTP	1330-1334
Hematocrit: SI (L/L=1)	HTPSI	1335-1339
Mean cell volume: SI (fL)	MVPSI	1340-1344
Mean cell hemoglobin: SI (pg)	MCPSI	1345-1349
Mean cell hemoglobin concentration	MHP	1350-1354
Mean cell hemoglobin concentration: SI	MHPSI	1355-1359
Red cell distribution width (%)	RWP	1360-1364
Red cell distribution width:SI(fraction)	RWPSI	1365-1370
Platelet count	PLP	1371-1375
Platelet count: SI	PLPSI	1376-1380
Platelet distribution width (%)	DWP	1381-1385
Mean platelet volume: SI (fL)	PVPSI	1386-1390
Segment neutrophil(percent of 100 cells)	GRPDIF	1391-1393
Lymphocytes (percent of 100 cells)	LMPDIF	1394-1396
Monocytes (percent of 100 cells)	MOPDIF	1397-1398
Eosinophils (percent of 100 cells)	EOP	1399-1400
Basophils (percent of 100 cells)	BOP	1401-1402
Blasts (percent of 100 cells)	BLP	1403
Promyelocytes (percent of 100 cells)	PRP	1404
Metamyelocytes (percent of 100 cells)	MEP	1405

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Myelocytes (percent of 100 cells)	MLP	1406
Bands (percent of 100 cells)	BAP	1407-1408
Atyp lymphocytes (percent of 100 cells)	LAP	1409-1410
Anisocytosis (variation of cell size)	ANP	1411
Basophilic stippling	BSP	1412
Hypochromia (stain intensity of cell)	HZP	1413
Poikilocytosis (cell shape variation)	PKP	1414
Polychromatophilia(bluish color of cell)	POP	1415
Macrocytosis (large cell prevalence)	MRP	1416
Microcytosis (small cell prevalence)	MIP	1417
Sickle cells	SIP	1418
Spherocytosis	SHP	1419
Target cells	TTP	1420
Toxic granulation	TXP	1421
Vacuolated cells	VUP	1422
GENERAL BIOCHEMISTRY TESTS		
Lead (ug/dL)	PBP	1423-1426
Lead: SI (umol/L)	PBPSI	1427-1431
Erythrocyte protoporphyrin (ug/dL)	EPP	1432-1435
Erythrocyte protoporphyrin: SI (umol/L)	EPPSI	1436-1440
Serum iron (ug/dL)	FEP	1441-1443
Serum iron: SI (umol/L)	FEPSI	1444-1448
Serum TIBC (ug/dL)	TIP	1449-1452
Serum TIBC: SI (umol/L)	TIPSI	1453-1458
Serum transferrin saturation (%)	PXP	1459-1462
Serum ferritin (ng/mL)	FRP	1463-1466
Serum ferritin: SI (ug/L)	FRPSI	1467-1470
Serum folate (ng/mL)	FOP	1471-1475
Serum folate: SI (nmol/L)	FOPSI	1476-1480
RBC folate (ng/mL)	RBP	1481-1484
RBC folate: SI (nmol/L)	RBPSI	1485-1490
Serum vitamin B12 (pg/mL)	VBP	1491-1496
Serum vitamin B12: SI (pmol/L)	VBPSI	1497-1504
Serum vitamin C (mg/dL)	VCP	1505-1508
Serum vitamin C: SI (mmol/L)	VCPSI	1509-1514

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Serum normalized calcium: SI (mmol/L)	ICPSI	1515-1518
Serum total calcium: SI (mmol/L)	CAPSI	1519-1522
Serum selenium (ng/mL)	SEP	1523-1526
Serum selenium: SI (nmol/L)	SEPSI	1527-1530
Serum vitamin A (ug/dL)	VAP	1531-1533
Serum vitamin A: SI (umol/L)	VAPSI	1534-1537
Serum vitamin E (ug/dL)	VEP	1538-1542
Serum vitamin E: SI (umol/L)	VEPSI	1543-1548
Serum alpha carotene (ug/dL)	ACP	1549-1551
Serum alpha carotene: SI (umol/L)	ACPSI	1552-1555
Serum beta carotene (ug/dL)	BCP	1556-1559
Serum beta carotene: SI (umol/L)	BCPSI	1560-1564
Serum beta cryptoxanthin (ug/dL)	BXP	1565-1567
Serum beta cryptoxanthin: SI (umol/L)	BXPSI	1568-1571
Serum lutein/zeaxanthin (ug/dL)	LUP	1572-1574
Serum lutein/zeaxanthin: SI (umol/L)	LUPSI	1575-1578
Serum lycopene (ug/dL)	LYP	1579-1581
Serum lycopene: SI (umol/L)	LYPSI	1582-1585
Serum sum retinyl esters (ug/dL)	REP	1586-1588
Serum sum retinyl esters: SI (umol/L)	REPSI	1589-1592
Serum cotinine (ng/mL)	COP	1593-1597
Serum cholesterol (mg/dL)	TCP	1598-1600
Serum cholesterol: SI (mmol/L)	TCPSI	1601-1605
Serum triglycerides (mg/dL)	TGP	1606-1609
Serum triglycerides: SI (mmol/L)	TGPSI	1610-1614
Serum LDL cholesterol (mg/dL)	LCP	1615-1617
Serum LDL cholesterol: SI (mmol/L)	LCPSI	1618-1621
Serum HDL cholesterol (mg/dL)	HDP	1622-1624
Serum HDL cholesterol: SI (mmol/L)	HDPSI	1625-1628
Serum apolipoprotein AI (mg/dL)	AAP	1629-1631
Serum apolipoprotein AI: SI (g/L)	AAPSI	1632-1635
Serum apolipoprotein B (mg/dL)	ABP	1636-1638
Serum apolipoprotein B: SI (g/L)	ABPSI	1639-1642
Serum lipoprotein(a) (mg/dL)	LPP	1643-1645
Serum lipoprotein(a): SI (g/L)	LPPSI	1646-1649
Serum FSH: SI (IU/L)	FHPSI	1650-1654
Serum luteinizing hormone: SI (IU/L)	LHPSI	1655-1658
Plasma fibrinogen (mg/dL)	FBP	1659-1662

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Plasma fibrinogen: SI (g/L)	FBPSI	1663-1666
Serum C-reactive protein (mg/dL)	CRP	1667-1671
ANTIBODY TESTS		
Serum tetanus antibody (U/mL)	TEP	1672-1677
Serum hepatitis A antibody	AHP	1678
Serum hepatitis B core antibody	HBP	1679
Serum hepatitis B surface antibody	SSP	1680-1681
Serum hepatitis B surface antigen	SAP	1682
Serum hepatitis C antibody	HCP	1683
Serum hepatitis D antibody	DHP	1684
Serum herpes I antibody	H1P	1685
Serum herpes II antibody	H2P	1686
Serum rubella antibody	RUP	1687-1691
Serum rubella antibody (IU)	RUPUNIT	1692-1695
Serum varicella antibody	VRP	1696-1700
Serum toxoplasmosis antibody	TOP	1701-1703
Serum rheumatoid factor antibody	RFP	1704-1708
Serum latex antibody (IU/mL)	L1P	1709-1713
Serum helicobacter pylori antibody	HPP	1714
BIOCHEMISTRY PROFILE		
Serum sodium: SI (mmol/L)	NAPSI	1715-1719
Serum potassium: SI (mmol/L)	SKPSI	1720-1723
Serum chloride: SI (mmol/L)	CLPSI	1724-1728
Serum bicarbonate: SI (mmol/L)	C3PSI	1729-1730
Serum total calcium (mg/dL)	SCP	1731-1734
Serum total calcium: SI (mmol/L)	SCPSI	1735-1739
Serum phosphorus (mg/dL)	PSP	1740-1743
Serum phosphorus: SI (mmol/L)	PSPSI	1744-1748
Serum uric acid (mg/dL)	UAP	1749-1752
Serum uric acid: SI (umol/L)	UAPSI	1753-1757
Serum glucose (mg/dL)	SGP	1758-1760
Serum glucose: SI (mmol/L)	SGPSI	1761-1765

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Serum blood urea nitrogen (mg/dL)	BUP	1766-1768
Serum blood urea nitrogen: SI (mmol/L)	BUPSI	1769-1773
Serum total bilirubin (mg/dL)	TBP	1774-1777
Serum total bilirubin: SI (umol/L)	TBPSI	1778-1783
Serum creatinine (mg/dL)	CEP	1784-1787
Serum creatinine: SI (umol/L)	CEPSI	1788-1793
Serum iron (ug/dL)	SFP	1794-1796
Serum iron: SI (umol/L)	SFPSI	1797-1800
Serum cholesterol (mg/dL)	CHP	1801-1804
Serum cholesterol: SI (mmol/L)	CHPSI	1805-1810
Serum triglycerides (mg/dL)	TRP	1811-1814
Serum triglycerides: SI (mmol/L)	TRPSI	1815-1820
Aspartate aminotransferase: SI(U/L)	ASPSI	1821-1823
Alanine aminotransferase: SI (U/L)	ATPSI	1824-1826
Gamma glutamyl transferase: SI(U/L)	GGPSI	1827-1830
Serum lactate dehydrogenase: SI (U/L)	LDPSI	1831-1834
Serum alkaline phosphatase: SI (U/L)	APPSI	1835-1838
Serum total protein (g/dL)	TPP	1839-1842
Serum total protein: SI (g/L)	TPPSI	1843-1845
Serum albumin (g/dL)	AMP	1846-1848
Serum albumin: SI (g/L)	AMPSI	1849-1851
Serum globulin (g/dL)	GBP	1852-1854
Serum globulin: SI (g/L)	GBPSI	1855-1857
Serum osmolality: SI (mmol/Kg)	OSPSI	1858-1860
DIABETES TESTING PROFILE		
Glycated hemoglobin: (%)	GHP	1861-1864
Glycated hemoglobin: test method	GHPMETH	1865
Plasma glucose (mg/dL)	G1P	1866-1870
Plasma glucose: SI (mmol/L)	G1PSI	1871-1876
Incomplete glucose test (OGTT) code	G1PCODE	1877-1878
Minutes between drink and second draw	G1PTIM1	1879-1881
Minutes between first and second draw	G1PTIM2	1882-1884
Second plasma glucose (mg/dL)	G2P	1885-1889
Second plasma glucose: SI (mmol/L)	G2PSI	1890-1895
Serum C-peptide (pmol/mL)	C1P	1896-1900

NHANES III Laboratory Data File Index
Whole Blood, Serum, Plasma, and Urine Data

Description	Variable Name	Positions
Serum C-peptide: SI (nmol/L)	C1PSI	1901-1905
Second serum C-peptide (pmol/mL)	C2P	1906-1911
Second serum C-peptide: SI (nmol/L)	C2PSI	1912-1917
Serum insulin (uU/mL)	I1P	1918-1923
Serum insulin: SI (pmol/L)	I1PSI	1924-1930
Serum insulin: test kit	I1P2PFLG	1931
Second serum insulin (uU/mL)	I2P	1932-1937
Second serum insulin: SI (pmol/L)	I2PSI	1938-1944
URINE TESTS		
Urinary cadmium (ng/mL)	UDP	1945-1949
Urinary cadmium: SI (nmol/L)	UDPSI	1950-1955
Urinary creatinine (mg/dL)	URP	1956-1960
Urinary creatinine: SI (mmol/L)	URPSI	1961-1964
Urinary albumin (ug/mL)	UBP	1965-1970
Urinary iodine (ug/dL)	UIP	1971-1977

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

FILENAME=LAB VERSION 1.1 N=29314

DEMOGRAPHIC DATA

HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)

Positions / SAS name	Counts	Item description and code	Notes
1-5		Sample person identification number	
SEQN	29314	00003-53623	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)

Positions / SAS name	Counts	Item description and code	Notes
6-10		Family sequence number	See note
DMPFSEQ	29314	00001-20076	
11		Examination/interview status	See note
DMPSTAT	28857	2 Interviewed, MEC-examined	
	457	3 Interviewed, home-examined	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)

Positions SAS name	Counts	Item description and code		Notes
12		Race-ethnicity		See note
DMARETHN	10507	1	Non-Hispanic white	
	8756	2	Non-Hispanic black	
	8786	3	Mexican-American	
	1265	4	Other	
13		Race		See note
DMARACER	19180	1	White	
	9091	2	Black	
	1037	3	Other	
	6	8	Mexican-American of unknown race	
14		Ethnicity		See note
DMAETHNR	8786	1	Mexican-American	
	788	2	Other Hispanic	
	19740	3	Not Hispanic	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)

Positions SAS name	Counts	Item description and code		Notes
15		Sex		
HSSEX	13980	1	Male	
	15334	2	Female	
16-17		Age at interview (Screener)		See note
HSAGEIR	29165	01-89		
	149	90	90+	
18		Age at interview-unit (Screener)		
HSAGEU	29314	2	Years	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)

Positions SAS name	Counts	Item description and code		Notes
19-22		Age in months (Screener)		See note
HSAITMOR	29157	0012-1079		
	147	1080	1080+ months	
	10	9999	Don't know	
23-24		Family size		See note
HSFSIZER	3076	01		
	5411	02		
	5006	03		
	5950	04		
	4313	05		
	2312	06		
	1236	07		
	821	08		
	428	09		
	761	10	10+	
25-26		Household size		See note
HSHSIZER	2478	01		
	5473	02		
	5040	03		
	6041	04		
	4337	05		
	2393	06		
	1301	07		
	893	08		
	459	09		
	899	10	10+	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)

Positions SAS name	Counts	Item description and code	Notes
27-29 DMPCNTYR		County FIPS codes for United States counties with populations >= 500,000	See note
	13799	001-439	
	15515	Blank	
30-31 DMPFIPSR		State FIPS codes for United States counties with populations >= 500,000	See note
	359	04	
	4531	06	
	1090	12	
	900	17	
	242	25	
	676	26	
	312	29	
	1662	36	
	625	39	
	724	42	
	276	44	
	2044	48	
	358	53	
	15515	Blank	
32 DMPMETRO		Urbanization classification based on USDA Rural/Urban continuum codes.	See note
	14615	1 Central counties of metro areas of 1 million population or more, OR, Fringe counties of metro areas of 1 million population or more	
	14699	2 All other areas	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

HOUSEHOLD SCREENER QUESTIONNAIRE (HSQ)

Positions SAS name	Counts	Item description and code		Notes
33		Census region		See note
DMPCREGN	3740	1	Northeast	
	5498	2	Midwest	
	12639	3	South	
	7437	4	West	
34-39		Poverty Income Ratio		See note
DMPPIR	82	00.000	No reported income	
	26503	000.02-11.889		
	2729	888888	Blank but applicable	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

SURVEY DESIGN DATA

Positions SAS name	Counts	Item description and code		Notes
40		Phase of NHANES III survey		See note
SDPPHASE	14833	1	1988-1991	
	14481	2	1991-1994	
41		Total NHANES III Pseudo-PSU		See note
SDPPSU6	14630	1		
	14684	2		
42-43		Total NHANES III Pseudo-stratum		See note
SDPSTRA6	29314	01-49		
44		Phase 1 Pseudo-PSU		See note
SDPPSU1	7633	1		
	7200	2		
	14481	Blank		
45-46		Phase 1 Pseudo-stratum		See note
SDPSTRA1	14833	01-23		
	14481	Blank		
47		Phase 2 Pseudo-PSU		See note
SDPPSU2	7080	1		
	7401	2		
	14833	Blank		
48-49		Phase 2 Pseudo-stratum		See note
SDPSTRA2	14481	01-23		
	14833	Blank		

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

SAMPLING WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
50-58 WTPFQX6		Total NHANES III interviewed sample final weight	See note
	29314	000215.53-0132278.9	
59-67 WTPFEX6		Total NHANES III MEC-examined sample final weight	See note
	457	000000.00	
	28857	000213.45-140778.72	
68-76 WTPFHX6		Total NHANES III MEC and home-examined final weight	See note
	29314	000214.25-139744.91	
77-85 WTPFALG6		Total NHANES III allergy subsample final weight	See note
	23	000000.00	
	12106	000213.45-288897.91	
	17185	Blank	
86-94 WTPFCNS6		Total NHANES III central nervous system (CNS) subsample final weight	See note
	12	000000.00	
	5662	001316.46-295826.48	
	23640	Blank	
95-103 WTPFSD6		Total NHANES III morning session MEC-examined subsample final weight	See note
	920	000000.00	
	9127	000450.95-292590.96	
	19267	Blank	
104-112 WTPFMD6		Total NHANES III afternoon/evening session MEC-examined subsample final weight	See note
	697	000000.00	
	9497	000495.13-256201.99	
	19120	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

SAMPLING WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
113-121 WTPFHSD6		Total NHANES III morning session MEC and home-examined subsample final weight	See note
	791	000000.00	
	9254	000446.49-291479.91	
	19269	Blank	
122-130 WTPFHMD6		Total NHANES III afternoon/evening session MEC and home-examined subsample final weight	See note
	562	000000.00	
	9630	000503.56-256245.36	
	19122	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

SAMPLING WEIGHTS - NHANES III PHASE 1 (1988-91)

Positions SAS name	Counts	Item description and code	Notes
131-139 WTPFQX1		Phase 1 interviewed sample final weight	See note
	14833	000461.29-264557.81	
	14481	Blank	
140-148 WTPFEX1		Phase 1 MEC-examined sample final weight	See note
	229	000000.00	
	14604	000527.01-281557.44	
	14481	Blank	
149-157 WTPFHX1		Phase 1 MEC and home-examined sample final weight	See note
	14833	000513.14-279489.83	
	14481	Blank	
158-166 WTPFALG1		Phase 1 allergy subsample final weight	See note
	14	000000.00	
	6097	000821.62-577795.82	
	23203	Blank	
167-175 WTPFCNS1		Phase 1 central nervous system (CNS) subsample final weight	See note
	8	000000.00	
	2751	002699.84-591652.96	
	26555	Blank	
176-184 WTPFSD1		Phase 1 morning session MEC-examined subsample fnal weight	See note
	451	000000.00	
	4462	001111.36-585181.93	
	24401	Blank	
185-193 WTPFMD1		Phase 1 afternoon/evening session MEC-examined subsample final weight	See note
	322	000000.00	
	4726	001104.11-506697.07	
	24266	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

SAMPLING WEIGHTS - NHANES III PHASE 1 (1988-91)

Positions SAS name	Counts	Item description and code	Notes
194-202 WTPFHSD1		Phase 1 morning session MEC and home-examined subsample final weight	See note
	373	000000.00	
	4540	0001091.8-582959.83	
	24401	Blank	
203-211 WTPFHMD1		Phase 1 afternoon/evening session MEC and home-examined subsample final weight	See note
	264	000000.00	
	4784	001085.73-507417.05	
	24266	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DEMOGRAPHIC DATA

SAMPLING WEIGHTS - NHANES III PHASE 2 (1991-94)

Positions SAS name	Counts	Item description and code	Notes
212-220 WTPFQX2		Phase 2 interviewed sample final weight	See note
	14481	000431.06-243267.38	
	14833	Blank	
221-229 WTPFEX2		Phase 2 MEC-examined sample final weight	See note
	228	000000.00	
	14253	000426.91-262887.56	
	14833	Blank	
230-238 WTPFHX2		Phase 2 MEC and home-examined sample final weight	See note
	14481	0000428.5-262188.52	
	14833	Blank	
239-247 WTPFALG2		Phase 2 allergy subsample final weight	See note
	9	000000.00	
	6009	000426.91-552445.57	
	23296	Blank	
248-256 WTPFCNS2		Phase 2 central nervous system (CNS) subsample final weight	See note
	4	000000.00	
	2911	002632.92-518040.33	
	26399	Blank	
257-265 WTPFSD2		Phase 2 morning session MEC-examined subsample fnal weight	See note
	469	000000.00	
	4665	0000901.9-550430.69	
	24180	Blank	
266-274 WTPFMD2		Phase 2 afternoon/evening session MEC-examined subsample final weight	See note
	375	000000.00	
	4771	000990.26-512403.98	
	24168	Blank	

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SAMPLING WEIGHTS - NHANES III PHASE 2 (1991-94)

Positions SAS name	Counts	Item description and code	Notes
275-283 WTPFHSD2		Phase 2 morning session MEC and home-examined subsample final weight	See note
	418	000000.00	
	4714	000892.98-552545.64	
	24182	Blank	
284-292 WTPFHMD2		Phase 2 afternoon/evening session MEC and home-examined subsample final weight	See note
	298	000000.00	
	4846	001007.13-512490.71	
	24170	Blank	

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FAY'S BRR REPLICATE INTERVIEW WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
293-301 WTPQRP1	29314	Replicate 1 final interview weight 000053.27-148435.02	See note
302-310 WTPQRP2	29314	Replicate 2 final interview weight 000067.13-143746.82	See note
311-319 WTPQRP3	29314	Replicate 3 final interview weight 000047.49-152075.62	See note
320-328 WTPQRP4	29314	Replicate 4 final interview weight 000062.62-137241.93	See note
329-337 WTPQRP5	29314	Replicate 5 final interview weight 000048.42-147700.94	See note
338-346 WTPQRP6	29314	Replicate 6 final interview weight 0000053.1-146803.63	See note
347-355 WTPQRP7	29314	Replicate 7 final interview weight 000058.18-145261.07	See note
356-364 WTPQRP8	29314	Replicate 8 final interview weight 000048.23-161126.44	See note
365-373 WTPQRP9	29314	Replicate 9 final interview weight 000053.27-147301.59	See note
374-382 WTPQRP10	29314	Replicate 10 final interview weight 000073.37-0148125.5	See note
383-391 WTPQRP11	29314	Replicate 11 final interview weight 000058.31-146940.58	See note
392-400 WTPQRP12	29314	Replicate 12 final interview weight 000053.67-153958.72	See note
401-409 WTPQRP13	29314	Replicate 13 final interview weight 000067.93-147395.78	See note

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FAY'S BRR REPLICATE INTERVIEW WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
410-418 WTPQRP14	29314	Replicate 14 final interview weight 000065.08-138456.05	See note
419-427 WTPQRP15	29314	Replicate 15 final interview weight 000062.35-140673.55	See note
428-436 WTPQRP16	29314	Replicate 16 final interview weight 000040.28-147603.74	See note
437-445 WTPQRP17	29314	Replicate 17 final interview weight 000045.36-154057.83	See note
446-454 WTPQRP18	29314	Replicate 18 final interview weight 000070.42-138896.98	See note
455-463 WTPQRP19	29314	Replicate 19 final interview weight 000050.96-139447.18	See note
464-472 WTPQRP20	29314	Replicate 20 final interview weight 000045.79-156365.73	See note
473-481 WTPQRP21	29314	Replicate 21 final interview weight 000049.79-146241.31	See note
482-490 WTPQRP22	29314	Replicate 22 final interview weight 000047.25-0154848.6	See note
491-499 WTPQRP23	29314	Replicate 23 final interview weight 000037.18-148309.04	See note
500-508 WTPQRP24	29314	Replicate 24 final interview weight 000057.42-141344.14	See note
509-517 WTPQRP25	29314	Replicate 25 final interview weight 000044.13-145105.09	See note
518-526 WTPQRP26	29314	Replicate 26 final interview weight 0000066.1-146773.53	See note

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FAY'S BRR REPLICATE INTERVIEW WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
527-535 WTPQRP27	29314	Replicate 27 final interview weight 000044.88-142455.25	See note
536-544 WTPQRP28	29314	Replicate 28 final interview weight 000000046-148272.41	See note
545-553 WTPQRP29	29314	Replicate 29 final interview weight 000079.38-153624.57	See note
554-562 WTPQRP30	29314	Replicate 30 final interview weight 000058.09-151140.25	See note
563-571 WTPQRP31	29314	Replicate 31 final interview weight 000051.39-159963.39	See note
572-580 WTPQRP32	29314	Replicate 32 final interview weight 000066.17-132356.37	See note
581-589 WTPQRP33	29314	Replicate 33 final interview weight 0000057.8-136762.37	See note
590-598 WTPQRP34	29314	Replicate 34 final interview weight 000062.28-140628.16	See note
599-607 WTPQRP35	29314	Replicate 35 final interview weight 000063.73-154630.49	See note
608-616 WTPQRP36	29314	Replicate 36 final interview weight 000067.29-153648.69	See note
617-625 WTPQRP37	29314	Replicate 37 final interview weight 000043.47-135065.98	See note
626-634 WTPQRP38	29314	Replicate 38 final interview weight 000054.55-152122.87	See note
635-643 WTPQRP39	29314	Replicate 39 final interview weight 000050.55-152941.69	See note

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FAY'S BRR REPLICATE INTERVIEW WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
644-652 WTPQRP40	29314	Replicate 40 final interview weight 000054.45-146815.92	See note
653-661 WTPQRP41	29314	Replicate 41 final interview weight 000059.62-141514.78	See note
662-670 WTPQRP42	29314	Replicate 42 final interview weight 000068.97-0140162.4	See note
671-679 WTPQRP43	29314	Replicate 43 final interview weight 000044.04-150981.83	See note
680-688 WTPQRP44	29314	Replicate 44 final interview weight 000040.36-144080.03	See note
689-697 WTPQRP45	29314	Replicate 45 final interview weight 000054.74-0142465.6	See note
698-706 WTPQRP46	29314	Replicate 46 final interview weight 000078.43-137838.21	See note
707-715 WTPQRP47	29314	Replicate 47 final interview weight 000052.71-145055.34	See note
716-724 WTPQRP48	29314	Replicate 48 final interview weight 000046.91-148787.77	See note
725-733 WTPQRP49	29314	Replicate 49 final interview weight 0000072.4-148375.43	See note
734-742 WTPQRP50	29314	Replicate 50 final interview weight 000070.53-159394.39	See note
743-751 WTPQRP51	29314	Replicate 51 final interview weight 000054.73-0144964.3	See note
752-760 WTPQRP52	29314	Replicate 52 final interview weight 000072.04-149087.24	See note

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FAY'S BRR REPLICATE EXAMINATION WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
761-769		Replicate 1 final exam weight	See note
WTPXRP1	457	000000.00	
	28857	000054.73-164698.81	
770-778		Replicate 2 final exam weight	See note
WTPXRP2	457	000000.00	
	28857	0000067.3-164887.24	
779-787		Replicate 3 final exam weight	See note
WTPXRP3	457	000000.00	
	28857	0000048.2-0161201.8	
788-796		Replicate 4 final exam weight	See note
WTPXRP4	457	000000.00	
	28857	000067.24-149561.18	
797-805		Replicate 5 final exam weight	See note
WTPXRP5	457	000000.00	
	28857	000055.97-146312.81	
806-814		Replicate 6 final exam weight	See note
WTPXRP6	457	000000.00	
	28857	000051.48-156250.53	
815-823		Replicate 7 final exam weight	See note
WTPXRP7	457	000000.00	
	28857	000060.06-0157694.3	
824-832		Replicate 8 final exam weight	See note
WTPXRP8	457	000000.00	
	28857	0000053.1-169111.97	
833-841		Replicate 9 final exam weight	See note
WTPXRP9	457	000000.00	
	28857	000052.31-156939.22	
842-850		Replicate 10 final exam weight	See note
WTPXRP10	457	000000.00	
	28857	000072.13-0165805.2	

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FAY'S BRR REPLICATE EXAMINATION WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
851-859		Replicate 11 final exam weight	See note
WTPXRP11	457	000000.00	
	28857	000053.54-154918.93	
860-868		Replicate 12 final exam weight	See note
WTPXRP12	457	000000.00	
	28857	000055.35-164023.88	
869-877		Replicate 13 final exam weight	See note
WTPXRP13	457	000000.00	
	28857	0000067.9-147355.32	
878-886		Replicate 14 final exam weight	See note
WTPXRP14	457	000000.00	
	28857	000067.04-154034.72	
887-895		Replicate 15 final exam weight	See note
WTPXRP15	457	000000.00	
	28857	000062.21-156384.73	
896-904		Replicate 16 final exam weight	See note
WTPXRP16	457	000000.00	
	28857	000000040-157994.12	
905-913		Replicate 17 final exam weight	See note
WTPXRP17	457	000000.00	
	28857	000048.34-160889.46	
914-922		Replicate 18 final exam weight	See note
WTPXRP18	457	000000.00	
	28857	0000075.2-153937.93	
923-931		Replicate 19 final exam weight	See note
WTPXRP19	457	000000.00	
	28857	000056.83-149483.14	
932-940		Replicate 20 final exam weight	See note
WTPXRP20	457	000000.00	
	28857	0000045.1-165457.71	

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FAY'S BRR REPLICATE EXAMINATION WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
941-949		Replicate 21 final exam weight	See note
WTPXRP21	457	000000.00	
	28857	000055.15-152305.97	
950-958		Replicate 22 final exam weight	See note
WTPXRP22	457	000000.00	
	28857	000045.53-159746.13	
959-967		Replicate 23 final exam weight	See note
WTPXRP23	457	000000.00	
	28857	000037.51-158016.62	
968-976		Replicate 24 final exam weight	See note
WTPXRP24	457	000000.00	
	28857	000054.91-153043.54	
977-985		Replicate 25 final exam weight	See note
WTPXRP25	457	000000.00	
	28857	000043.77-155179.51	
986-994		Replicate 26 final exam weight	See note
WTPXRP26	457	000000.00	
	28857	000071.23-168273.22	
995-1003		Replicate 27 final exam weight	See note
WTPXRP27	457	000000.00	
	28857	000043.82-153212.25	
1004-1012		Replicate 28 final exam weight	See note
WTPXRP28	457	000000.00	
	28857	000045.61-147920.01	
1013-1021		Replicate 29 final exam weight	See note
WTPXRP29	457	000000.00	
	28857	000083.17-159279.49	
1022-1030		Replicate 30 final exam weight	See note
WTPXRP30	457	000000.00	
	28857	000059.05-162389.35	

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FAY'S BRR REPLICATE EXAMINATION WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
1031-1039		Replicate 31 final exam weight	See note
WTPXRP31	457	000000.00	
	28857	000052.61-163894.16	
1040-1048		Replicate 32 final exam weight	See note
WTPXRP32	457	000000.00	
	28857	000067.05-0149876.8	
1049-1057		Replicate 33 final exam weight	See note
WTPXRP33	457	000000.00	
	28857	000055.58-153417.47	
1058-1066		Replicate 34 final exam weight	See note
WTPXRP34	457	000000.00	
	28857	000063.45-156981.83	
1067-1075		Replicate 35 final exam weight	See note
WTPXRP35	457	000000.00	
	28857	000064.47-157897.09	
1076-1084		Replicate 36 final exam weight	See note
WTPXRP36	457	000000.00	
	28857	000067.68-171875.06	
1085-1093		Replicate 37 final exam weight	See note
WTPXRP37	457	000000.00	
	28857	000045.36-153137.39	
1094-1102		Replicate 38 final exam weight	See note
WTPXRP38	457	000000.00	
	28857	000055.94-159979.02	
1103-1111		Replicate 39 final exam weight	See note
WTPXRP39	457	000000.00	
	28857	000057.47-151920.72	
1112-1120		Replicate 40 final exam weight	See note
WTPXRP40	457	000000.00	
	28857	000057.86-157191.41	

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FAY'S BRR REPLICATE EXAMINATION WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
1121-1129		Replicate 41 final exam weight	See note
WTPXRP41	457	000000.00	
	28857	0000061.4-000146023	
1130-1138		Replicate 42 final exam weight	See note
WTPXRP42	457	000000.00	
	28857	000069.57-154624.02	
1139-1147		Replicate 43 final exam weight	See note
WTPXRP43	457	000000.00	
	28857	000044.35-159439.04	
1148-1156		Replicate 44 final exam weight	See note
WTPXRP44	457	000000.00	
	28857	000044.16-155951.73	
1157-1165		Replicate 45 final exam weight	See note
WTPXRP45	457	000000.00	
	28857	000059.87-147941.67	
1166-1174		Replicate 46 final exam weight	See note
WTPXRP46	457	000000.00	
	28857	000074.92-150980.02	
1175-1183		Replicate 47 final exam weight	See note
WTPXRP47	457	000000.00	
	28857	000050.64-151763.92	
1184-1192		Replicate 48 final exam weight	See note
WTPXRP48	457	000000.00	
	28857	0000045.8-156115.62	
1193-1201		Replicate 49 final exam weight	See note
WTPXRP49	457	000000.00	
	28857	000082.17-159609.54	
1202-1210		Replicate 50 final exam weight	See note
WTPXRP50	457	000000.00	
	28857	000071.97-168153.71	

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FAY'S BRR REPLICATE EXAMINATION WEIGHTS - TOTAL NHANES III (1988-94)

Positions SAS name	Counts	Item description and code	Notes
1211-1219		Replicate 51 final exam weight	See note
WTPXRP51	457	000000.00	
	28857	000054.04-158632.23	
1220-1228		Replicate 52 final exam weight	See note
WTPXRP52	457	000000.00	
	28857	000073.26-158493.21	

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HOUSEHOLD YOUTH QUESTIONNAIRE (HYQ)

Positions SAS name	Counts	Item description and code	Notes
1229-1232		Age in months at household youth interview	See note
HYAITMO	11138	0012-0204	
	14	8888 Blank but applicable	
	18162	Blank	

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MEC EXAMINATION

Positions SAS name	Counts	Item description and code		Notes
1233		Language used by sample person in MEC		See note
MXPLANG	23936	1	English	
	3906	2	Spanish	
	3	3	Other	
	1469	Blank		
1234		Examination session for MEC examinees		See note
MXPSESSR	13643	1	Morning	
	9419	2	Afternoon	
	5795	3	Evening	
	457	Blank		
1235		Day of week of MEC exam		
MXPTIDW	2884	1	Sunday	
	2618	2	Monday	
	2503	3	Tuesday	
	2914	4	Wednesday	
	5466	5	Thursday	
	5082	6	Friday	
	7390	7	Saturday	
	457	Blank		

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MEC EXAMINATION

Positions SAS name	Counts	Item description and code	Notes
1236-1239		Age in months at MEC exam	See note
MXPAXTMR	28751	0012-1079	
	106	1080 1080+ months	
	457	Blank	

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HOME EXAMINATION

Positions SAS name	Counts	Item description and code	Notes
1240		Day of week of home exam	
HXPTIDW	22	1 Sunday	
	111	2 Monday	
	6	3 Tuesday	
	16	4 Wednesday	
	123	5 Thursday	
	119	6 Friday	
	60	7 Saturday	
	28857	Blank	
1241-1244		Age in months at home exam	See note
HXPAXTMR	410	0252-1079	
	47	1080 1080+ months	
	28857	Blank	
1245		Examination session for home examinees	See note
HXPSESSR	203	1 Morning	
	212	2 Afternoon	
	38	3 Evening	
	4	8 Blank but applicable	
	28857	Blank	

PHLEBOTOMY SCREENING QUESTIONNAIRE

Positions / SAS name	Counts	Item description and code		Notes
1246		Language		See note
PHPLANG	25009	1	English	
	2736	2	Spanish	
	1569	8	Blank but applicable	
1247		Do you have hemophilia? This is a hereditary blood-clotting disorder		See note
PHPHEMO	9	1	Yes, subsequent fields blank	
	27736	2	No	
	1569	8	Blank but applicable	
1248		Within the past four weeks have you received any cancer chemotherapy treatment?		See note
PHPCHM2	19	1	Yes, subsequent fields blank	
	27717	2	No	
	1569	8	Blank but applicable	
	9	Blank		
1249		Are you currently taking insulin?		See note
PHPINSU	418	1	Yes	
	27298	2	No	
	1570	8	Blank but applicable	
	28	Blank		
1250-1254		Including your last meal and any snacks, at what time did you last have anything at all to eat?		
PHPSNTI	27701	00:00-23:59		
	1585	88888	Blank but applicable	
	28	Blank		
1255		Day participant last ate		
PHPSNDA	12604	1	Yesterday	
	15081	2	Today	
	16	3	Before yesterday	
	1585	8	Blank but applicable	
	28	Blank		

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PHLEBOTOMY SCREENING QUESTIONNAIRE

Positions SAS name	Counts	Item description and code	Notes
1256 PHPDRIN		Have you had anything to drink, other than water, after the time you last ate?	
	3947	1 Yes	
	23754	2 No, subsequent drink fields blank	
	1585	8 Blank but applicable	
	28	Blank	
1257-1261 PHPDRTI		At what time did you last have anything at all to drink other than water?	
	3947	00:00-23:57	
	1585	88888 Blank but applicable	
	23782	Blank	
1262 PHPDRDA		Day participant last drank	
	1094	1 Yesterday	
	2853	2 Today	
	1585	8 Blank but applicable	
	23782	Blank	
1263-1267 PHPFAST		Computed number of hours since last ate or drank	See note
	27700	00000-39.13	
	1586	88888 Blank but applicable	
	28	Blank	
1268-1272 PHPBEST		Time of venipuncture	See note
	27703	07:32-22:02	
	1583	88888 Blank but applicable	
	28	Blank	

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HEMATOLOGY

Positions SAS name	Counts	Item description and code	Notes
1273-1277		White blood cell count	See note
WCP	26372	01.75-71.35	
	2914	88888 Blank but applicable	
	28	Blank	
1278-1282		White blood cell count: SI	
WCPSI	26372	01.75-71.35	
	2914	88888 Blank but applicable	
	28	Blank	
1283-1287		Lymphocyte percent (Coulter)	
LMPPCNT	26370	003.2-083.2	
	2916	88888 Blank but applicable	
	28	Blank	
1288-1292		Mononuclear percent (Coulter)	
MOPPCNT	25924	00000-37.55	
	3362	88888 Blank but applicable	
	28	Blank	
1293-1297		Granulocyte percent (Coulter)	
GRPPCNT	25925	010.9-093.9	
	3361	88888 Blank but applicable	
	28	Blank	
1298-1302		Lymphocyte number (Coulter)	See note
LMP	26370	00.35-048.1	
	2916	88888 Blank but applicable	
	28	Blank	
1303-1306		Mononuclear number (Coulter)	See note
MOP	25924	0000-06.4	
	3362	8888 Blank but applicable	
	28	Blank	
1307-1311		Granulocyte number (Coulter)	See note
GRP	25925	000.2-023.4	
	3361	88888 Blank but applicable	
	28	Blank	

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HEMATOLOGY

Positions	SAS name	Counts	Item description and code	Notes
1312-1315	RCP	26370	Red blood cell count 1.69-6.84	See note
		2916	8888 Blank but applicable	
		28	Blank	
1316-1319	RCPSI	26370	Red blood cell count: SI 1.69-6.84	
		2916	8888 Blank but applicable	
		28	Blank	
1320-1324	HGP	26372	Hemoglobin (g/dL) 04.95-019.6	See note
		2914	88888 Blank but applicable	
		28	Blank	
1325-1329	HGPSI	26372	Hemoglobin: SI (g/L) 049.5-00196	
		2914	88888 Blank but applicable	
		28	Blank	
1330-1334	HTP	26370	Hematocrit (%) 016.6-057.6	See note
		2916	88888 Blank but applicable	
		28	Blank	
1335-1339	HTPSI	26370	Hematocrit: SI (L/L=1) 0.166-0.576	
		2916	88888 Blank but applicable	
		28	Blank	
1340-1344	MVPSI	26371	Mean cell volume: SI (fL) 051.2-122.8	See note
		2915	88888 Blank but applicable	
		28	Blank	
1345-1349	MCPSI	26369	Mean cell hemoglobin: SI (pg) 013.6-053.6	See note
		2917	88888 Blank but applicable	
		28	Blank	

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HEMATOLOGY

Positions SAS name	Counts	Item description and code	Notes
1350-1354 MHP		Mean cell hemoglobin concentration (g/dL)	See note
	26369	25.95-52.35	
	2917	88888 Blank but applicable	
	28	Blank	
1355-1359 MHPSI		Mean cell hemoglobin concentration: SI (g/L)	
	26369	259.5-523.5	
	2917	88888 Blank but applicable	
	28	Blank	
1360-1364 RWP		Red cell distribution width (%)	
	26372	007.8-31.95	
	2914	88888 Blank but applicable	
	28	Blank	
1365-1370 RWPSI		Red cell distribution width: SI (fraction)	
	26372	00.078-0.3195	
	2914	888888 Blank but applicable	
	28	Blank	
1371-1375 PLP		Platelet count	See note
	26367	014.5-00981	
	2919	88888 Blank but applicable	
	28	Blank	
1376-1380 PLPSI		Platelet count: SI	
	26367	014.5-00981	
	2919	88888 Blank but applicable	
	28	Blank	
1381-1385 DWP		Platelet distribution width (%)	
	26200	005.8-24.65	
	3086	88888 Blank but applicable	
	28	Blank	

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HEMATOLOGY

Positions SAS name	Counts	Item description and code	Notes
1386-1390		Mean platelet volume: SI (fL)	
PVPSI	26373	00003-00043	
	2913	88888 Blank but applicable	
	28	Blank	
1391-1393		Segmented neutrophils (percent of 100 cells)	See note
GRPDIF	8150	007-090	
	2276	888 Blank but applicable	
	18888	Blank	
1394-1396		Lymphocytes (percent of 100 cells)	See note
LMPDIF	8150	004-088	
	2276	888 Blank but applicable	
	18888	Blank	
1397-1398		Monocytes (percent of 100 cells)	See note
MOPDIF	8150	00-23	
	2276	88 Blank but applicable	
	18888	Blank	
1399-1400		Eosinophils (percent of 100 cells)	See note
EOP	8150	00-51	
	2276	88 Blank but applicable	
	18888	Blank	
1401-1402		Basophils (percent of 100 cells)	See note
BOP	8150	00-22	
	2276	88 Blank but applicable	
	18888	Blank	
1403		Blasts (percent of 100 cells)	See note
BLP	8150	0	
	2276	8 Blank but applicable	
	18888	Blank	
1404		Promyelocytes (percent of 100 cells)	See note
PRP	8150	0	
	2276	8 Blank but applicable	
	18888	Blank	

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HEMATOLOGY

Positions / SAS name	Counts	Item description and code	Notes
1405		Metamyelocytes (percent of 100 cells)	See note
MEP	8150	0-2	
	2276	8 Blank but applicable	
	18888	Blank	
1406		Myelocytes (percent of 100 cells)	See note
MLP	8150	0-1	
	2276	8 Blank but applicable	
	18888	Blank	
1407-1408		Bands (percent of 100 cells)	See note
BAP	8150	00-22	
	2276	88 Blank but applicable	
	18888	Blank	
1409-1410		Atypical lymphocytes (percent of 100 cells)	See note
LAP	8150	00-28	
	2276	88 Blank but applicable	
	18888	Blank	
1411		Anisocytosis (variation of cell size)	See note
ANP	6120	0 Normal	
	2030	1-4 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1412		Basophilic stippling	See note
BSP	8047	0 Normal	
	103	1-3 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1413		Hypochromia (stain intensity of cell)	See note
HZP	6891	0 Normal	
	1259	1-4 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	

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HEMATOLOGY

Positions SAS name	Counts	Item description and code	Notes
1414		Poikilocytosis (cell shape variation)	See note
PKP	7067	0 Normal	
	1083	1-4 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1415		Polychromatophilia (bluish color of cell)	See note
POP	7231	0 Normal	
	919	1-3 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1416		Macrocytosis (large cell prevalence)	See note
MRP	7569	0 Normal	
	581	1-3 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1417		Microcytosis (small cell prevalence)	See note
MIP	6873	0 Normal	
	1277	1-4 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1418		Sickle cells	See note
SIP	8135	0 Normal	
	15	1-3 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1419		Spherocytosis	See note
SHP	7479	0 Normal	
	671	1-4 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	
1420		Target cells	See note
TTP	7620	0 Normal	
	530	1-4 Gradation to abnormal	
	2276	8 Blank but applicable	
	18888	Blank	

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HEMATOLOGY

Positions SAS name	Counts	Item description and code		Notes
1421		Toxic granulation		See note
TXP	7839	0	Normal	
	311	1-4	Gradation to abnormal	
	2276	8	Blank but applicable	
	18888	Blank		
1422		Vacuolated cells		See note
VUP	8150	0	Normal	
	2276	8	Blank but applicable	
	18888	Blank		

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GENERAL BIOCHEMISTRY TESTS

Positions SAS name	Counts	Item description and code	Notes
1423-1426		Lead (ug/dL)	
PBP	2342	00.7 Below level of detection	
	24476	0001-71.8	
	2468	8888 Blank but applicable	
	28	Blank	
1427-1431		Lead: SI (umol/L)	
PBPSI	2342	0.034 Below level of detection	
	24476	0.048-3.465	
	2468	88888 Blank but applicable	
	28	Blank	
1432-1435		Protoporphyrin (ug/dL RBC)	
EPP	26706	0003-1008	
	2580	8888 Blank but applicable	
	28	Blank	
1436-1440		Protoporphyrin: SI (umol/L RBC)	
EPPSI	26706	00.05-17.94	
	2580	88888 Blank but applicable	
	28	Blank	
1441-1443		Serum iron (ug/dL)	See note
FEP	26479	004-338	
	2807	888 Blank but applicable	
	28	Blank	
1444-1448		Serum iron: SI (umol/L)	
FEPSI	26479	00.72-60.54	
	2807	88888 Blank but applicable	
	28	Blank	
1449-1452		Serum TIBC (ug/dL)	
TIP	25802	0069-0866	
	3484	8888 Blank but applicable	
	28	Blank	
1453-1458		Serum TIBC: SI (umol/L)	
TIPSI	25802	012.36-0155.1	
	3484	888888 Blank but applicable	
	28	Blank	

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GENERAL BIOCHEMISTRY TESTS

Positions SAS name	Counts	Item description and code	Notes
1459-1462		Serum transferrin saturation (%)	See note
PXP	25770	00.8-98.5	
	3516	8888 Blank but applicable	
	28	Blank	
1463-1466		Serum ferritin (ng/mL)	
FRP	13	0002 Below level of detection	
	26380	0003-3059	
	2893	8888 Blank but applicable	
	28	Blank	
1467-1470		Serum ferritin: SI (ug/L)	
FRPSI	13	0002 Below level of detection	
	26380	0003-3059	
	2893	8888 Blank but applicable	
	28	Blank	
1471-1475		Serum folate (ng/mL)	See note
FOP	1	000.1 Below level of detection	
	23704	000.4-00199	
	1937	88888 Blank but applicable	
	3672	Blank	
1476-1480		Serum folate: SI (nmol/L)	
FOPSI	1	000.2 Below level of detection	
	23704	000.9-450.9	
	1937	88888 Blank but applicable	
	3672	Blank	
1481-1484		RBC folate (ng/mL)	See note
RBP	23404	0007-1755	
	2238	8888 Blank but applicable	
	3672	Blank	
1485-1490		RBC folate: SI (nmol/L)	
RBPSI	23404	0015.9-3976.8	
	2238	888888 Blank but applicable	
	3672	Blank	

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GENERAL BIOCHEMISTRY TESTS

Positions / SAS name	Counts	Item description and code	Notes
1491-1496		Serum vitamin B12 (pg/mL)	
VBP	12024	000033-099999	
	722	888888 Blank but applicable	
	16568	Blank	
1497-1504		Serum vitamin B12: SI (pmol/L)	
VBPSI			
	12024	00024.35-73779.26	
	722	88888888 Blank but applicable	
	16568	Blank	
1505-1508		Serum vitamin C (mg/dL)	See note
VCP	20636	0000-4.72	
	2408	8888 Blank but applicable	
	6270	Blank	
1509-1514		Serum vitamin C: SI (mmol/L)	
VCPSI	20636	000000-000268	
	2408	888888 Blank but applicable	
	6270	Blank	
1515-1518		Serum normalized calcium: SI (mmol/L)	See note
ICPSI	16737	0.81-1.95	
	3022	8888 Blank but applicable	
	9555	Blank	
1519-1522		Serum total calcium: SI (mmol/L)	
CAPSI	4	1.06 Below level of detection	
	18490	1.57-3.29	
	1265	8888 Blank but applicable	
	9555	Blank	
1523-1526		Serum selenium (ng/mL)	See note
SEP	18597	0039-0622	
	1619	8888 Blank but applicable	
	9098	Blank	
1527-1530		Serum selenium: SI (nmol/L)	
SEPSI	18597	00.5-07.9	
	1619	8888 Blank but applicable	
	9098	Blank	

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GENERAL BIOCHEMISTRY TESTS

Positions SAS name	Counts	Item description and code	Notes
1531-1533		Serum vitamin A (ug/dL)	
VAP	23274	002-259	
	2368	888 Blank but applicable	
	3672	Blank	
1534-1537		Serum vitamin A: SI (umol/L)	
VAPSI	23274	0.07-9.04	
	2368	8888 Blank but applicable	
	3672	Blank	
1538-1542		Serum vitamin E (ug/dL)	See note
VEP	23274	00028-09999	
	2368	88888 Blank but applicable	
	3672	Blank	
1543-1548		Serum vitamin E: SI (umol/L)	
VEPSI	23274	000.65-232.18	
	2368	888888 Blank but applicable	
	3672	Blank	
1549-1551		Serum alpha carotene (ug/dL)	
ACP	23274	000-202	
	2368	888 Blank but applicable	
	3672	Blank	
1552-1555		Serum alpha carotene: SI (umol/L)	
ACPSI	23274	0000-3.76	
	2368	8888 Blank but applicable	
	3672	Blank	
1556-1559		Serum beta carotene (ug/dL)	See note
BCP	5	0000 Below level of detection	
	23269	0001-0674	
	2368	8888 Blank but applicable	
	3672	Blank	
1560-1564		Serum beta carotene: SI (umol/L)	
BCPSI	5	00.00 Below level of detection	
	23269	00.02-12.56	
	2368	88888 Blank but applicable	
	3672	Blank	

GENERAL BIOCHEMISTRY TESTS

Positions SAS name	Counts	Item description and code	Notes
1565-1567		Serum beta cryptoxanthin (ug/dL)	
BXP	23272	000-144	
	2370	888 Blank but applicable	
	3672	Blank	
1568-1571		Serum beta cryptoxanthin: SI (umol/L)	
BXPSI	23272	0000-02.6	
	2370	8888 Blank but applicable	
	3672	Blank	
1572-1574		Serum lutein/zeaxanthin (ug/dL)	See note
LUP	3	000 Below level of detection	
	23271	001-478	
	2368	888 Blank but applicable	
	3672	Blank	
1575-1578		Serum lutein/zeaxanthin: SI (umol/L)	
LUPSI	3	0.00 Below level of detection	
	23271	0.02-08.4	
	2368	8888 Blank but applicable	
	3672	Blank	
1579-1581		Serum lycopene (ug/dL)	See note
LYP	25	000 Below level of detection	
	23249	001-124	
	2368	888 Blank but applicable	
	3672	Blank	
1582-1585		Serum lycopene: SI (umol/L)	
LYPSI	25	0.00 Below level of detection	
	23249	0.02-2.31	
	2368	8888 Blank but applicable	
	3672	Blank	
1586-1588		Serum sum retinyl esters (ug/dL)	
REP	23274	000-269	
	2368	888 Blank but applicable	
	3672	Blank	

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GENERAL BIOCHEMISTRY TESTS

Positions SAS name	Counts	Item description and code	Notes
1589-1592		Serum sum retinyl esters: SI (umol/L)	
REPSI	23274	0000-9.39	
	2368	8888 Blank but applicable	
	3672	Blank	
1593-1597		Serum cotinine (ng/mL)	See note
COP	29314	Blank	
*Note: See LAB2 file for Updated Serum Cotinine Data			
1598-1600		Serum cholesterol (mg/dL)	
TCP	23561	059-702	
	2081	888 Blank but applicable	
	3672	Blank	
1601-1605		Serum cholesterol: SI (mmol/L)	
TCPSI	23561	01.53-18.15	
	2081	88888 Blank but applicable	
	3672	Blank	
1606-1609		Serum triglycerides (mg/dL)	See note
TGP	23515	0013-3616	
	2127	8888 Blank but applicable	
	3672	Blank	
1610-1614		Serum triglycerides: SI (mmol/L)	
TGPSI	23515	00.15-40.82	
	2127	88888 Blank but applicable	
	3672	Blank	
1615-1617		Serum LDL cholesterol (mg/dL)	See note
LCP	7891	020-380	
	2254	888 Blank but applicable	
	19169	Blank	
1618-1621		Serum LDL cholesterol: SI (mmol/L)	
LCPSI	7891	0.52-9.83	
	2254	8888 Blank but applicable	
	19169	Blank	

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GENERAL BIOCHEMISTRY TESTS

Positions / SAS name	Counts	Item description and code	Notes
1622-1624		Serum HDL cholesterol (mg/dL)	
HDP	23409	008-196	
	2233	888 Blank but applicable	
	3672	Blank	
1625-1628		Serum HDL cholesterol: SI (mmol/L)	
HDPSI	23409	0.21-5.07	
	2233	8888 Blank but applicable	
	3672	Blank	
1629-1631		Serum apolipoprotein AI (mg/dL)	See note
AAP	11432	059-300	
	1464	888 Blank but applicable	
	16418	Blank	
1632-1635		Serum apolipoprotein AI: SI (g/L)	
AAPSI	11432	0.59-0003	
	1464	8888 Blank but applicable	
	16418	Blank	
1636-1638		Serum apolipoprotein B (mg/dL)	See note
ABP	11483	040-260	
	1413	888 Blank but applicable	
	16418	Blank	
1639-1642		Serum apolipoprotein B: SI (g/L)	
ABPSI	11483	00.4-02.6	
	1413	8888 Blank but applicable	
	16418	Blank	
1643-1645		Serum lipoprotein (a) (mg/dL)	
LPP	12018	000-276	
	728	888 Blank but applicable	
	16568	Blank	
1646-1649		Serum lipoprotein (a): SI (g/L)	
LPPSI	12018	0000-2.76	
	728	8888 Blank but applicable	
	16568	Blank	

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GENERAL BIOCHEMISTRY TESTS

Positions SAS name	Counts	Item description and code	Notes
1650-1654 FHPSI		Serum follicle stimulating hormone: SI (IU/L)	
	6	000.1 Below level of detection	
	3116	000.2-00170	
	253	88888 Blank but applicable	
	25939	Blank	
1655-1658 LHPSI		Serum luteinizing hormone: SI (IU/L)	
	2	00.1 Below level of detection	
	3118	00.2-67.1	
	255	8888 Blank but applicable	
	25939	Blank	
1659-1662 FBP		Plasma fibrinogen (mg/dL)	
	9350	0019-0957	
	810	8888 Blank but applicable	
	19154	Blank	
1663-1666 FBPSI		Plasma fibrinogen: SI (g/L)	
	9350	0.19-9.57	
	810	8888 Blank but applicable	
	19154	Blank	
1667-1671 CRP		Serum C-reactive protein (mg/dL)	
	16218	00.21 Below level of detection	
	6249	000.3-025.2	
	3175	88888 Blank but applicable	
	3672	Blank	

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ANTIBODY TESTS

Positions SAS name	Counts	Item description and code		Notes
1672-1677		Serum tetanus antibody (U/mL)		
TEP	19336	000000-074.67		
	5849	888888	Blank but applicable	
	4129	Blank		
1678		Serum hepatitis A antibody		
AHP		(anti-HAV)		
	9872	1	Positive	
	11376	2	Negative	
	12	3	Borderline	
	1784	8	Blank but applicable	
	6270	Blank		
1679		Serum hepatitis B core antibody		See note
HBP		(anti-HBc)		
	1368	1	Positive	
	19886	2	Negative	
	11	3	Borderline	
	1779	8	Blank but applicable	
	6270	Blank		
1680-1681		Serum hepatitis B surface antibody		See note
SSP		(anti-HBs)		
	593	01	Positive	
	160	02	Negative	
	108	03	Borderline	
	340	11	> 10 mIU	
	155	22	< 10 mIU	
	1856	88	Blank but applicable	
	26102	Blank		
1682		Serum hepatitis B surface antigen		See note
SAP		(HBsAg)		
	82	1	Positive	
	1292	2	Negative	
	1	3	Borderline	
	1837	8	Blank but applicable	
	26102	Blank		

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ANTIBODY TESTS

Positions SAS name	Counts	Item description and code	Notes
1683		Serum hepatitis C antibody	
HCP		(anti-HCV)	
	402	1 Positive	
	20796	2 Negative	
	43	4 Indeterminate	
	1803	8 Blank but applicable	
	6270	Blank	
1684		Serum hepatitis D antibody	See note
DHP		(anti-HDV)	
	3	1 Positive	
	76	2 Negative	
	4	8 Blank but applicable	
	29231	Blank	
1685		Serum herpes I antibody	
H1P	9843	1 Positive	
	3205	2 Negative	
	50	3 Indeterminate	
	3184	8 Blank but applicable	
	13032	Blank	
1686		Serum herpes II antibody	
H2P	3532	1 Positive	
	9476	2 Negative	
	86	3 Indeterminate	
	3188	8 Blank but applicable	
	13032	Blank	
1687-1691		Serum rubella antibody	See note
RUP	21288	00000-72.91	
	2213	88888 Blank but applicable	
	5813	Blank	
1692-1695		Serum rubella antibody (IU)	See note
RUPUNIT	21288	0000-1224	
	2213	8888 Blank but applicable	
	5813	Blank	

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ANTIBODY TESTS

Positions SAS name	Counts	Item description and code	Notes
1696-1700		Serum varicella antibody	See note
VRP	21288	00000-29.64	
	2213	88888 Blank but applicable	
	5813	Blank	
1701-1703		Serum toxoplasmosis antibody	See note
TOP	17658	000-240	
	2558	888 Blank but applicable	
	9098	Blank	
1704-1708		Serum rheumatoid factor antibody	
RFP	5271	00000-40960	
	437	88888 Blank but applicable	
	23606	Blank	
1709-1713		Serum latex antibody (IU/mL)	See note
L1P	5524	00000-47.48	
	23790	Blank	
1714		Serum helicobacter pylori antibody	See note
HPP	848	1 Positive	
	1733	2 Negative	
	125	3 Equivocal	
	26608	Blank	

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BIOCHEMISTRY PROFILE

Positions SAS name	Counts	Item description and code	Notes
1715-1719		Serum sodium: SI (mmol/L)	
NAPSI	18723	123.4-177.5	
	1493	88888 Blank but applicable	
	9098	Blank	
1720-1723		Serum potassium: SI (mmol/L)	
SKPSI	18723	2.51-6.94	
	1493	8888 Blank but applicable	
	9098	Blank	
1724-1728		Serum chloride: SI (mmol/L)	
CLPSI	18723	076.2-121.6	
	1493	88888 Blank but applicable	
	9098	Blank	
1729-1730		Serum bicarbonate: SI (mmol/L)	
C3PSI	18721	04-53	
	1495	88 Blank but applicable	
	9098	Blank	
1731-1734		Serum total calcium (mg/dL)	
SCP	18722	06.6-15.4	
	1494	8888 Blank but applicable	
	9098	Blank	
1735-1739		Serum total calcium: SI (mmol/L)	
SCPSI	18722	01.65-03.85	
	1494	88888 Blank but applicable	
	9098	Blank	
1740-1743		Serum phosphorus (mg/dL)	
PSP	18723	01.5-10.5	
	1493	8888 Blank but applicable	
	9098	Blank	
1744-1748		Serum phosphorus: SI (mmol/L)	
PSPSI	18723	0.484-03.39	
	1493	88888 Blank but applicable	
	9098	Blank	

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BIOCHEMISTRY PROFILE

Positions SAS name	Counts	Item description and code	Notes
1749-1752		Serum uric acid (mg/dL)	
UAP	18723	00.2-15.9	
	1493	8888 Blank but applicable	
	9098	Blank	
1753-1757		Serum uric acid: SI (umol/L)	
UAPSI	18723	011.9-945.7	
	1493	88888 Blank but applicable	
	9098	Blank	
1758-1760		Serum glucose (mg/dL)	See note
SGP	18719	037-571	
	1497	888 Blank but applicable	
	9098	Blank	
1761-1765		Serum glucose: SI (mmol/L)	
SGPSI	18719	02.05-031.7	
	1497	88888 Blank but applicable	
	9098	Blank	
1766-1768		Serum blood urea nitrogen (mg/dL)	
BUP	18723	002-104	
	1493	888 Blank but applicable	
	9098	Blank	
1769-1773		Serum blood urea nitrogen: SI (mmol/L)	
BUPSI	18723	00.71-37.13	
	1493	88888 Blank but applicable	
	9098	Blank	
1774-1777		Serum total bilirubin (mg/dL)	
TBP	18723	0000-10.4	
	1493	8888 Blank but applicable	
	9098	Blank	
1778-1783		Serum total bilirubin: SI (umol/L)	
TBPSI	18723	000000-177.84	
	1493	888888 Blank but applicable	
	9098	Blank	

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BIOCHEMISTRY PROFILE

Positions SAS name	Counts	Item description and code	Notes
1784-1787		Serum creatinine (mg/dL)	
CEP	18722	00.3-13.9	
	1494	8888 Blank but applicable	
	9098	Blank	
1788-1793		Serum creatinine: SI (umol/L)	
CEPSI	18722	0026.5-1228.8	
	1494	888888 Blank but applicable	
	9098	Blank	
1794-1796		Serum iron (ug/dL)	See note
SFP	14056	000-464	
	1493	888 Blank but applicable	
	13765	Blank	
1797-1800		Serum iron: SI (umol/L)	
SFPSI	14056	0000-83.1	
	1493	8888 Blank but applicable	
	13765	Blank	
1801-1804		Serum cholesterol (mg/dL)	See note
CHP	18721	0039-0748	
	1495	8888 Blank but applicable	
	9098	Blank	
1805-1810		Serum cholesterol: SI (mmol/L)	
CHPSI	18721	01.009-19.343	
	1495	888888 Blank but applicable	
	9098	Blank	
1811-1814		Serum triglycerides (mg/dL)	See note
TRP	14056	0003-3900	
	1493	8888 Blank but applicable	
	13765	Blank	
1815-1820		Serum triglycerides: SI (mmol/L)	
TRPSI	14056	00.034-44.031	
	1493	888888 Blank but applicable	
	13765	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

BIOCHEMISTRY PROFILE

Positions / SAS name	Counts	Item description and code	Notes
1821-1823		Serum aspartate aminotransferase: SI	
ASPSI		(U/L)	
	18723	006-517	
	1493	888 Blank but applicable	
	9098	Blank	
1824-1826		Serum alanine aminotransferase: SI	
ATPSI		(U/L)	
	18723	001-486	
	1493	888 Blank but applicable	
	9098	Blank	
1827-1830		Serum gamma glutamyl transferase: SI	See note
GGPSI		(U/L)	
	14549	0001-1342	
	1495	8888 Blank but applicable	
	13270	Blank	
1831-1834		Serum lactate dehydrogenase: SI	
LDPSI		(U/L)	
	18721	0029-0970	
	1495	8888 Blank but applicable	
	9098	Blank	
1835-1838		Serum alkaline phosphatase: SI (U/L)	
APPSI	18721	0017-0952	
	1495	8888 Blank but applicable	
	9098	Blank	
1839-1842		Serum total protein (g/dL)	
TPP	18723	04.6-10.4	
	1493	8888 Blank but applicable	
	9098	Blank	
1843-1845		Serum total protein: SI (g/L)	
TPPSI	18723	046-104	
	1493	888 Blank but applicable	
	9098	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

BIOCHEMISTRY PROFILE

Positions SAS name	Counts	Item description and code	Notes
1846-1848		Serum albumin (g/dL)	
AMP	18723	0.9-6.1	
	1493	888 Blank but applicable	
	9098	Blank	
1849-1851		Serum albumin: SI (g/L)	
AMPSI	18723	009-061	
	1493	888 Blank but applicable	
	9098	Blank	
1852-1854		Serum globulin (g/dL)	See note
GBP	14056	1.5-6.6	
	1493	888 Blank but applicable	
	13765	Blank	
1855-1857		Serum globulin: SI (g/L)	
GBPSI	14056	015-066	
	1493	888 Blank but applicable	
	13765	Blank	
1858-1860		Serum osmolality: SI (mmol/Kg)	See note
OSPSI	14056	241-352	
	1493	888 Blank but applicable	
	13765	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DIABETES TESTING PROFILE

Positions / SAS name	Counts	Item description and code	Notes
1861-1864		Glycated hemoglobin: (%)	See note
GHP	23476	02.8-16.2	
	2166	8888 Blank but applicable	
	3672	Blank	
1865		Glycated hemoglobin: test method	See note
GHPMETH	13892	1 Diamat method (instrument 1)	
	4811	2 Diamat method (instrument 2)	
	2549	3 Diamat method (instrument 3)	
	2224	4 Affinity method	
	2166	8 Blank but applicable	
	3672	Blank	
1866-1870		Plasma glucose - first venipuncture (mg/dL)	See note
G1P	15877	035.4-642.6	
	674	88888 Blank but applicable	
	12763	Blank	
1871-1876		Plasma glucose - first venipuncture: SI (mmol/L)	
G1PSI	15877	01.965-35.671	
	674	888888 Blank but applicable	
	12763	Blank	
1877-1878		Incomplete glucose test (OGTT) code	See note
G1PCODE	2	20 Hemophiliac	
	11	21 Chemotherapy within 4 weeks	
	301	22 Diabetic on insulin	
	98	23 Refused venipuncture	
	42	24 Ill/faint during test	
	142	25 Venipuncture unsuccessful	
	12	26 Physician canceled test	
	187	27 Refused glucose challenge	
	368	99 All remaining reasons	
	28151	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DIABETES TESTING PROFILE

Positions SAS name	Counts	Item description and code	Notes
1879-1881 G1PTIM1		Minutes between glucose challenge and second venipuncture	See note
	6640	086-178	
	855	888 Blank but applicable	
	21819	Blank	
1882-1884 G1PTIM2		Minutes between first and second venipuncture	See note
	6637	094-184	
	858	888 Blank but applicable	
	21819	Blank	
1885-1889 G2P		Plasma glucose - second venipuncture (mg/dL)	See note
	6652	033.7-755.1	
	843	88888 Blank but applicable	
	21819	Blank	
1890-1895 G2PSI		Plasma glucose - second venipuncture: SI (mmol/L)	
	6652	01.871-41.916	
	843	888888 Blank but applicable	
	21819	Blank	
1896-1900 C1P		Serum C-peptide - first venipuncture (pmol/mL)	See note
	63	0.021 Below level of detection	
	15730	00.03-12.77	
	758	88888 Blank but applicable	
	12763	Blank	
1901-1905 C1PSI		Serum C-peptide - first venipuncture: SI (nmol/L)	
	63	0.021 Below level of detection	
	15730	00.03-12.77	
	758	88888 Blank but applicable	
	12763	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DIABETES TESTING PROFILE

Positions SAS name	Counts	Item description and code	Notes
1906-1911 C2P		Serum C-peptide - second venipuncture (pmol/mL)	See note
	1	00.021 Below level of detection	
	3365	00.075-15.363	
	381	888888 Blank but applicable	
	25567	Blank	
1912-1917 C2PSI		Serum C-peptide - second venipuncture: SI (nmol/L)	
	1	00.021 Below level of detection	
	3365	00.075-15.363	
	381	888888 Blank but applicable	
	25567	Blank	
1918-1923 I1P		Serum insulin - first venipuncture (uU/mL)	See note
	65	001.76 Below level of detection	
	15689	002.51-002367	
	797	888888 Blank but applicable	
	12763	Blank	
1924-1930 I1PSI		Serum insulin - first venipuncture: SI (pmol/L)	
	65	0010.56 Below level of detection	
	15689	0015.06-0014202	
	797	8888888 Blank but applicable	
	12763	Blank	
1931 I1P2PFLG		Serum insulin - first venipuncture: test kit	See note
	2693	1 Kit 1	
	1906	2 Kit 2	
	11156	3 Kit 3	
	796	8 Blank but applicable	
	12763	Blank	
1932-1937 I2P		Serum insulin - second venipuncture (uU/mL)	See note
	3378	0002.7-823.01	
	369	888888 Blank but applicable	
	25567	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

DIABETES TESTING PROFILE

Positions SAS name	Counts	Item description and code	Notes
1938-1944 I2PSI		Serum insulin - second venipuncture: SI (pmol/L)	
	3378	00016.2-4938.06	
	369	8888888 Blank but applicable	
	25567	Blank	

NHANES III Laboratory Data File
Whole Blood, Serum, Plasma, and Urine Data

URINE TESTS

Positions SAS name	Counts	Item description and code	Notes
1945-1949 UDP		Urinary cadmium (ng/mL)	
	22321	00.01-16.65	
	749	88888 Blank but applicable	
	6244	Blank	
1950-1955 UDPSI		Urinary cadmium: SI (nmol/L)	
	22321	000.09-148.14	
	749	888888 Blank but applicable	
	6244	Blank	
1956-1960 URP		Urinary creatinine (mg/dL)	See note
	83	007.9 Below level of detection	
	22162	011.3-682.1	
	825	88888 Blank but applicable	
	6244	Blank	
1961-1964 URPSI		Urinary creatinine: SI (mmol/L)	
	83	00.7 Below level of detection	
	22162	0001-60.3	
	825	8888 Blank but applicable	
	6244	Blank	
1965-1970 UBP		Urinary albumin (ug/mL)	
	386	0000.4 Below level of detection	
	21859	0000.5-015700	
	825	888888 Blank but applicable	
	6244	Blank	
1971-1977 UIP		Urinary iodine (ug/dL)	
	5	00000.1 Below level of detection	
	22085	00000.5-0019750	

980	8888888	Blank but applicable
6244	Blank	

DEMOGRAPHIC DATA: NOTES

Screener Questionnaire

DMPFSEQ: Family sequence number

This variable can be used to determine all family members who participated in the survey. Sample persons who have identical family sequence numbers (i.e. match on all 5 digits) are members of the same family.

DMPSTAT: Examination/interview status

This variable identifies the interview or examination status of all persons selected for the NHANES III sample. Interviewed persons completed preselected questions in specific sections of the Household Adult or Youth Questionnaires. Mobile examination center (MEC)-examined persons were interviewed and successfully completed at least one examination component in the MEC. Home-examined persons were interviewed and successfully completed at least one home examination component. The home examination was an option for frail older adults, infants 2-11 months of age, and other adults who were unable to come to the MEC.

DMARETHN: Race-ethnicity

This key analytic variable, based on the NHANES III survey design, was derived from many sources of data and is based on reported race and ethnicity. The other category includes all Hispanics, regardless of race, who were not Mexican-American and also includes all non-Hispanics from racial groups other than white or black.

DMARACER: Race

This variable was obtained from two primary sources: the Screener and the Family Questionnaires. Prior to the selection of the sample, race (Black, White, Other) was self-reported or reported by proxy in the Screener Questionnaire. During the administration of the Family Questionnaire, race was self-reported or reported by the respondent of the Family Questionnaire from five categories (Aleut, Eskimo, American Indian, Asian or Pacific Islander, Black, White, Other). Responses from the two sources were adjudicated, as necessary, to create a three level variable (Black, White, Other).

DMAETHNR: Ethnicity

This variable was obtained from two primary sources: the Screener and the Family Questionnaires. As part of both interviews, hand cards were used to determine Mexican/Mexican-American or Other Latin American/Spanish ancestry or national origin. Responses of non-Hispanic ancestry or national origin were categorized as other. Responses from the two interviews were adjudicated, as necessary, and this three level variable was created.

HSAGEIR: Age (Screener Questionnaire)

Age was calculated using the birth date which was obtained from the Screener Questionnaire. The variable HSAGEU provides the age unit (months or years) for HSAGEIR. Ages of 90 years or greater were recoded into a single category of 90+ years to help protect the confidentiality of survey participants.

HSAITMOR: Age in months (Screener Questionnaire)

Age in months was calculated by computing number of months between the Screener Questionnaire date and date of birth. This variable was created for analyses where exact age at the interview may be needed. HSAITMOR differs slightly from the age in years (HSAGEIR), the variable most often used for analyses. Ages of 1080 months and older (90 years and older) were recoded into a single category of 1080+ months to protect the confidentiality of survey participants.

HSFSIZER: Family Size

Family size represents the total number of related persons living in a household (single dwelling unit). All household members were rostered by family during the Screener interview. Household members who were related to the family reference person (knowledgeable household member 17 years or older who owned or rented the dwelling unit) by blood or marriage were considered part of the family. Adopted children, foster- and god-children were also included, if they were living in the dwelling unit. However, family members who were away at college, or living independently were not included. Other household members who were unrelated to the reference person were considered members of separate families. Families with 10 members or more were recoded into a single response category of 10+ persons to help protect confidentiality. See note for Household Size (HSHSIZER).

HSHSIZER: Household Size

Household size represents the total number of persons living in a single dwelling unit, both related and unrelated. All permanent household members were rostered according to their family as part the Screener interview. This was done in order to obtain a complete list of all persons living or staying in the dwelling unit, and to distinguish household and family members. Households with 10 members or more were recoded into a single response category of 10+ persons to help protect confidentiality. See note for Family Size (HFHSIZER).

DMPCNTYR: County FIPS codes for United States counties with populations of 500,000 and more

These county FIPS codes identify large counties with populations of 500,000 and more that were sampled in the survey. Counties with

population less than 500,000 are not included to prevent identification of these locations. See Appendix 1 for listing of codes.

DMPFIPSR: State FIPS codes for United States counties with populations of 500,000 and more

These state FIPS codes identify counties with populations of 500,000+ that were sampled in the survey. Counties with population less than 500,000 are not included to prevent identification of these locations. See Appendix 1 for listing of codes.

DMPMETRO: Urbanization classification based on USDA Rural-Urban continuum codes

These classifications are based on the USDA Rural-Urban codes (Butler and Beale, 1993) that describe metro and nonmetro counties by degree of urbanization and nearness to metro areas. The USDA codes were recoded into two categories to prevent identification of counties that were sampled in the survey.

DMPCREGN: Census region

The United States was divided into four broad geographic regions as defined by the Bureau of Census. Because all states were not included in the selected sample, regional estimates may not be representative for a given region.

DMPPIR: Poverty income ratio (or poverty index)

The poverty income ratio (PIR) was computed as a ratio of two components. The numerator was the midpoint of the observed family income category in the Family Questionnaire variable:HFF19R. The denominator was the poverty threshold, the age of the family reference person, and the calender year in which the family was interviewed.

Poverty threshold values (in dollars) are produced annually by the Census Bureau (Series P-60). These threshold values are based on calendar years and adjusted for changes caused by inflation between calendar years. Reports for each of the calendar years in the survey (1988-94) were used in the calculation of PIR. For the years 1991 and 1994, data from preliminary reports were used. The poverty income ratio allows income data to be analyzed in a comparable manner across the six years of the survey and with previous NHANES.

Persons who reported having had no income and were assigned a zero value for PIR. A substantial proportion of persons refused to report their income or income category during the Family Questionnaire. Due to the income nonresponse the potential for bias in PIR may be high. Users are cautioned to examine potential nonresponse bias for PIR and other income variables.

Survey Design Data

SDPPHASE: Phase of NHANES III survey

For operational purposes, 81 primary sampling units were divided into 89 survey locations (or stands) and randomly allocated to two three-year phases. Phase 1 data were collected from October 1988 through October 1991 and Phase 2 data were collected from October 1991 through October 1994.

SDPSTRA6, SDPSTRA1, SDPSTRA2, and SDPPSU6, SDPPSU1, SDPPSU2: Pseudo strata codes and pseudo PSU pair codes

Because NHANES III was based upon a complex sample design, the assumptions of many statistical tests and routinely available statistical programs are not met. For this reason, when estimates of the variances of statistics are computed, the technique of estimation must be based upon complex sampling theory. In order to provide users with the capability of estimating the complex sample variances, 49 pseudo strata and a pair of Primary Sampling Unit (PSU) codes per stratum were designed.

A software package, "SUDAAN- Software for the Statistical Analysis of Correlated Data" (Shah, 1995), was developed by the Research Triangle Institute to analyze complex sample design data like NHANES. SUDAAN uses strata and PSU codes to conduct analysis with two PSU per stratum design. Therefore, definition of pseudo strata and PSU provided in this data file should be used to compute complex sample variances in analyses. Other software available for estimation of complex sample variance may also be used. For further discussion of methods of variance estimation in NHANES III, see additional information on this subject in Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

Sampling Weights

WTPFQX6, WTPFQX1, WTPFQX2: Total NHANES III and phase-specific final interview weights

These sampling weights should be used only for items collected during the household interviews. To compute final interview weights, final basic weights were first adjusted for nonresponse to household interview, then post-stratified to the unpublished Current Population Survey 1990 (Phase 1) and 1993 (Phase 2) population control estimates of the U.S. population adjusted for undercount. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFEX6, WTPFEX1, WTPFEX2: Total NHANES III and phase-specific final MEC examination weights

These MEC sampling weights should be used for analysis of measurements or interview items collected in the MEC. Persons who were not examined in the MEC have a sampling weight of zero and should be excluded from analyses. To compute final MEC examination weights, final interview weights were first adjusted for nonresponse to MEC examinations, then post-stratified to the unpublished Current Population Survey 1990 (Phase 1) and 1993 (Phase 2) population control estimates of the U.S. population adjusted for undercount. For details, see Weighting and Estimation Methodology(U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFHX6, WTPFHX1, WTPFHX2: Total NHANES III and phase-specific MEC+home examination weights

These MEC+home sampling weights should be used for analysis of the examination items where measurements or interview items were collected in the MEC and home. Persons who were not examined in the MEC or home have a sampling weight of zero and should be excluded from analyses. To compute final MEC+home examination weights, final interview weights were first adjusted for nonresponse to MEC and home examinations, then post-stratified to unpublished Current Population Survey 1990 (Phase 1) and 1993 (Phase 2) population control estimates of the U.S. population adjusted for undercount. No separate sampling weights were computed for home examinees. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFALG6, WTPFALG1, WTPFALG2: Total NHANES III and phase-specific allergy examination subsample weights

These subsample weights are for analysis of allergy measurements. Allergy skin reactivity tests were administered to all MEC-examined persons aged 6-19 years and a random half-sample of the adults aged 20-59 years. Eligible MEC-examined persons who did not complete the allergy tests have a sampling weight of zero and should be excluded from the analyses. Final MEC examination weights were first adjusted for selection of the half-sample among adults (20-59 years), and post-stratified to the unpublished Current Population Survey 1990 (Phase 1) and 1993 (Phase 2) population control estimates of the U.S. population adjusted for undercount in the final step. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFCNS6, WTPFCNS1, WTPFCNS2: Total NHANES III and phase-specific central nervous system (CNS) examination subsample final weights

These subsample weights are for analysis of measurements from the Central Nervous System (CNS) test. The CNS examination was administered to a random half-sample of the adults aged 20-69 years. Eligible MEC-examined persons who did not complete CNS testing have a sampling weight of zero and should be excluded from the analyses. Final MEC examination weights were first adjusted for selection of half sample among adults (20-59 years), and post-stratified to unpublished Current

Population Survey 1990 (Phase 1) and 1993 (Phase 2) population control estimates of the U.S. population adjusted for undercount in the final step. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFSD6, WTPFSD1, WTPFSD2: Total NHANES III and phase-specific morning session MEC examination subsample final weights

These subsample weights are for special analyses where fasting time may be an important factor. They were computed for persons aged 12 years and older who were scheduled and examined in the MEC morning session. Sampled households in the survey were randomly assigned to one of two groups -- morning session ("standard") or afternoon/evening session ("modified") assignments. All sample persons from a household received the same session assignment and were requested to schedule examinations for the assigned session. Fasting instructions varied by age and session assignment (Plan and Operation of The Third National Health and Nutrition Examination Survey, 1988-94 , U.S. DHHS, 1996). It should be noted that actual fasting time may have differed from the instructed fasting time and can be obtained from the variable PHPFAST in the NHANES III Laboratory Data File. To compute these weights, final MEC examination weights were first adjusted for the random half selection, then adjusted for the non-response to assigned session, and finally, post-stratified to the unpublished Current Population Survey 1990 and 1993 Population control estimates of the U.S. population adjusted for undercount. Eligible MEC-examined persons who were assigned to the morning session and examined in another session have a sampling weight of zero and should be excluded in analyses. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFMD6, WTPFMD1, WTPFMD2: Total NHANES III and phase-specific afternoon/evening session MEC examination subsample final weights

These subsample weights are for special analyses where fasting time might be an important factor. They were computed for MEC examined persons aged 12 years and older who were scheduled and examined in the afternoon or evening sessions. Sampled households in the survey were randomly assigned to one of two groups -- morning session ("standard") or afternoon/evening session ("modified") assignments. All sample persons from a household received the same session assignment and were requested to schedule examinations for the assigned session. Fasting instruction varied by age and session assignments (Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94, U.S. DHHS, 1996). It should be noted that actual fasting time may have differed from the instructed fasting time and can be obtained from the variable PHPFAST in the NHANES III Laboratory Data File.) compute these weights, final MEC examination weights were first adjusted for the random half selection, then adjusted for the nonresponse to assigned session, and finally, post-stratified to the unpublished Current Population Survey 1990 and 1993 population control estimates of the U.S. population adjusted for undercount. Eligible MEC examined persons who were

assigned to the afternoon or evening sessions and examined in another session have a sampling weight of zero and should be excluded in analyses. For details, see Weighting and Estimation Methodology (U.S.DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFHSD6, WTPFHSD1, WTPFHSD2: Total NHANES III and phase-specific morning session MEC+home examination subsample final post stratified weights

These subsample weights are for special analyses where fasting time may be an important factor. They were computed for MEC+home examined persons aged 12 years and older who were scheduled and examined in the morning session. Sampled households in the survey were randomly assigned to one of two groups -- morning session ("standard") or afternoon/evening session ("modified") assignments. All sample persons from a household received the same session assignment and were requested to schedule examinations for the assigned session. Fasting instruction varied by age and session assignments (Plan and Operations of the Third National Health and Nutrition Examination Survey, 1988-94, U.S. DHHS, 1996). It should be noted that actual fasting time may have differed from the instructed fasting time and can be obtained from the variable PHPFAST in the NHANES III Laboratory Data File. To compute these weights, final MEC+home examination weights were first adjusted for the random half selection, then adjusted for the nonresponse to assigned session, and finally, post-stratified to the unpublished Current Population Survey 1990 and 1993 population control estimates of the U.S. population adjusted for undercount. Eligible MEC+home examined persons who were assigned to the morning session and examined in another session have a sampling weight of zero and should be excluded in analyses. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPFHMD6, WTPFHMD1, WTPFHMD2: Total NHANES III and phase-specific afternoon/evening MEC+home examination subsample final weights

These subsample weights are for special analyses where fasting time may be an important factor. They were computed for MEC+home examined persons aged 12 years and older who were scheduled and examined in the afternoon or evening sessions. Sampled households in the survey were randomly assigned to one of two groups -- morning session ("standard") or afternoon/evening session ("modified") assignments. All sample persons from a household received the same session assignment and were requested to schedule examinations for the assigned session. Fasting instruction varied by age and session assignments (Plan and Operation of the Third National Health and Nutrition Examination Survey, U.S. DHHS, 1996). It should be noted that actual fasting time may have differed from the instructed fasting time. The actual fasting time can be obtained from the variable PHPFAST in the NHANES III Laboratory Data File. To compute these weights, final MEC+home examination weights were first adjusted for the random half selection, then adjusted for the nonresponse to assigned session, and finally, post-stratified to the unpublished Current Population Survey 1990 and 1993 population control estimates of the U.S. population adjusted for undercount. Eligible MEC+home examined persons who were

assigned to the afternoon or evening sessions and examined in another session have a sampling weight of zero and should be excluded in analyses. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPQRP1--WTPQRP52: Fay's BRR Replicate interview sample

To allow for alternative methods to estimate variance, 52 replicate weights were computed using repeated sampling method where WESVAR or other software that use repeated samples, can be used for estimating variance. Fay's method (see Fay, 1990; Judkins, 1990) was used to draw half samples and adjust sampling weights in each of the random half samples. Sampling weights in one half sample were multiplied by the factor k=1.7 and in the other half sample by k=0.3 using the Fay's method. After this adjustment, sampling weights were further adjusted for non-response and post-stratified using the same procedure as the final full sample interview weights. These weights should be used only for estimating variance of items from the household adult and youth interviews. For details, see Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

WTPXRP1--WTPXRP52: Fay's BRR Replicate weights for MEC- examined sample

To allow for alternative methods to estimate variance, 52 replicate weights were computed using repeated sampling method where WESVAR or other BRR type software can be used to estimate variance. Fay's method (see Fay, 1990; Judkins, 1990) was used to draw half samples and adjust sampling weights in each of the random half samples. Sampling weights in one half sample were multiplied by the factor k=1.7 and in the other half sample by k=0.3 using Fay's method. After this adjustment, weights were further adjusted for nonresponse and were post-stratified using the same procedure as the full sample final weights. These weights should be used only for estimating variance of outcome measurements or interview items from the MEC Examination. For details, see additional information on this subject in Weighting and Estimation Methodology (U.S. DHHS, 1996) and NHANES III Analytic and Reporting Guidelines (U.S. DHHS, 1996).

Household Youth Questionnaire

HYAITMO: Age in months (Household Youth Interview)

Age in months was calculated by computing number of months between Household Youth Interview date and the date of birth. It was created for special analyses where exact age at the interview may be needed. This computed age may be different from the self-reported age in HSAGEIR and HSAGEU, or HSAITMOR. For most analyses, age reported in HSAGEIR (and HSAGEU) should be used.

MEC Examination

MXPLANG: Language of MEC examination

This variables designates the language of conduct for the MEC examination. questionnaires were designed to be implemented in a bilingual (English/Spanish) format so that respondents could to be interviewed in their preferred language. When it was necessary to conduct an interview in a another language, a translator assisted the interviewer in administering the questionnaires. These interviews were coded as other.

MXPSESSR: Examination session for MEC examinees

This variable designates the period during the day that the examination occurred. To increase response rates and allow flexibility, examinations were scheduled in three sessions: morning, afternoon and evening. On occasion, more than one session was attended in order to complete the full examination. In such a situation, the session was coded as the one when most of the examinations were completed.

MXPAXTMR: Age in months at MEC examination

Age in total months was created for special analyses where exact age at the examination may be needed (e.g., computation of growth charts). It was calculated by computing number of months between examination date and the date of birth. Some examinees may have had a birthday between household interview and examination so that this computed age at examination may differ slightly from the age reported in HSAGEIR (and HSAGEU), or HSAITMOR. For most analyses age reported in HSAGEIR (and HSAGEU) should be used. Ages of 1080 months and older (90 years and older) were recoded into a single category of 1080+ months to protect the confidentiality of survey participants.

Home Examination

HXPAXTMR: Age in months at home examination

Age in total months was created for special analyses where exact age at the examination may be needed (e.g., computation of growth charts). It was calculated by computing number of months between examination date and the date of birth. Some examinees may have had a birthday between household interview and examination so that this computed age at examination may differ slightly from the age reported in HSAGEIR (and HSAGEU), or HSAITMOR. For most analyses age reported in HSAGEIR (and HSAGEU) should be used. Ages of 1080 months and older (90 years and older) were recoded into a single category of 1080+ months to protect the confidentiality of survey participants.

HXPSESSR: Examination session for home examinees

This variable designates the period during the day that the examination occurred. To increase response rates and allow flexibility, examinations were scheduled in three sessions: morning, afternoon and evening. On occasion, more than one session was attended in order to complete the full examination. In such a situation, the session was coded as the one when most of the examinations were completed.

References

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Appendix 1. State and county FIPS codes for areas with populations of 500,000 or more.

DMPFIPSR	State	DMPCNTYR	County
4	Arizona	13	Maricopa
6	California	1	Alameda
6	California	19	Fresno
6	California	37	Los Angeles
6	California	59	Orange
6	California	71	San Bernardino
6	California	73	San Diego
6	California	85	Santa Clara
6	California	111	Ventura
12	Florida	25	Dade
12	Florida	31	Duval
12	Florida	99	Palm Beach
17	Illinois	31	Cook
25	Massachusetts	17	Middlesex
26	Michigan	125	Oakland
26	Michigan	163	Wayne
29	Missouri	189	St Louis
36	New York	29	Erie
36	New York	47	Kings
36	New York	59	Nassau
36	New York	61	New York
36	New York	81	Queens
36	New York	119	Westchester
39	Ohio	35	Cuyahoga
39	Ohio	61	Hamilton
42	Pennsylvania	3	Allegheny
42	Pennsylvania	45	Delaware
42	Pennsylvania	101	Philadelphia
44	Rhode Island	7	Providence
48	Texas	29	Bexar
48	Texas	113	Dallas
48	Texas	141	El Paso
48	Texas	201	Harris
48	Texas	439	Tarrant
53	Washington	33	King

LABORATORY DATA: NOTES

AAP: Serum apolipoprotein AI

Apolipoprotein AI and apolipoprotein B results were measured only during 1988-1991. Three different methods were used at different times to measure apolipoprotein AI and apolipoprotein B. These were radial immunodiffusion (RID), rate immunonephelometry (INA), and the World Health Organization -International Federation of Clinical Chemistry (WHO-IFCC) method (Bachorik, 1994; Marcovina, 1991; Albers, 1989). Results using the RID and INA methods were adjusted to the WHO-IFCC method.

ABP: Serum apolipoprotein B

See note for AAP.

ANP: Anisocytosis

Microscopic examination (manual differential) of the peripheral blood spread on a glass slide utilized a stained blood film to perform a differential leukocyte count, evaluate red cell morphology, and estimate number of platelets. Manual differential variables include segmented neutrophils, lymphocytes, monocytes, eosinophils, basophils, blasts, promyelocytes, metamyelocytes, myelocytes, bands, atypical lymphocytes, anisocytosis, basophilic stippling, hypochromia, poikilocytosis, polychromatophilia, macrocytosis, microcytosis, sickle cells, spherocytosis, target cells, toxic granulation, and vacuolated cells (GRPDIF, LMPDIF, MOPDIF, EOP, BAP, BOP, BLP, PRP, MEP, MLP, BAP, LAP, ANP, BSP, HZP, PKP, POP, MRP, MIP, SIP, SHP, TTP, TXP, and VUP).

In NHANES III, a manual differential was performed on a special subsample of examinees aged one year and older. This manual differential was used for internal quality control purposes and to confirm abnormal hematology results.This subsample was defined as a random 10-percent sample of all examined persons plus all examinees who had a predetermined high or low value for one or more of the following hematologic assessments: white blood cell count (WBC), red blood cell count (RBC), hemoglobin, hematocrit, mean cell volume (MCV), mean cell hemoglobin (MCH), mean cell hemoglobin concentration (MCHC), red blood cell distribution width (RDW), platelet count, mean platelet volume (MPV), lymphocyte percentage, mononuclear percentage, or granulocyte percentage. A table of predetermined high and low values for WBC, RBC, hemoglobin, hematocrit, MCV, MCH, MCHC, RDW, platelet count, MPV, lymphocyte percentage, mononuclear percentage, and granulocyte percentage is located in the Manual for Medical Technicians (U.S. DHHS, pp. 5-54 and 5-55, 1996).

BAP: Band cells

See note for ANP.

BCP: Serum beta carotene

The lower limit of detection (LOD) for beta carotene was 0.67 ug/dL. Using the LOD coding formula (detection limit divided by the square root of two), the calculated value to indicate that the serum beta carotene results were below the level of detection would be 0.48. After rounding, the value of 0 (zero) was placed in the results field to indicate that the serum beta carotene was below 0.67 ug/dL.

BLP: Blast cells

See note for ANP.

BOP: Basophil cells

See note for ANP.

BSP: Basophilic stippling

See note for ANP.

C1P: Serum C-peptide (first venipuncture)

The specimen for this assay was obtained at the time of the initial venipuncture. This result is available for all six years of the survey.

Examinees aged 40-74 years who used insulin were excluded from the OGTT. A first venipuncture was obtained, but the glucose challenge and second venipuncture were canceled. In these instances, the variables G1P, C1P and I1P have a value, but the results G2P, C2P and I2P from the second venipuncture are blank-filled to indicate a medical exclusion.

C2P: Serum C-peptide (second venipuncture)

Post-glucose challenge levels of C-peptide and insulin for examinees who had an OGTT were measured only during 1991-1994.

CEP: Serum Creatinine

<u>Correction for Serum Creatinine for NHANES III is highly recommended:</u>

Serum creatinine is not standardized in many laboratories. The National Kidney Disease Education Program is attempting to have all laboratories standardize serum creatinine to reference methods (Myers, GL, et al. Recommendations for Improving Serum Creatinine Measurement: A Report from the Laboratory Working Group of the National Kidney Disease Education Program. Clin. Chem. 2006; 5-18). Equations for estimating glomerular filtration rate (GFR) from standardized creatinine have been published (Stevens LA, et al. N Engl J Med. 2006 Jun 8;354(23):2473-83). Serum creatinine assays on 190 stored specimens from NHANES III were used to determine if serum creatinine needed to be adjusted when compared to a method traceable to a “gold” standard reference method.

The Cleveland Clinic Foundation (CCF) laboratory analyzed the serum creatinine specimens using a Roche coupled enzymatic assay (creatininase, creatinase, sarcosine oxidase, kits # 1775677 and 1775766) performed on a Roche P Module instrument. The Roche method calibrators were traceable to an isotope dilution mass spectrometric method for serum creatinine using standard references methods (NIST SRM 967) and confirmed by analysis of CAP LN-24 linearity set based on NIST assigned values. Serum creatinine by the Roche method was then compared to the original NHANES III measurements which used the Jaffe kinetic alkaline picrate method performed on a Roche Hitachi 737 analyzer. There were significant differences in results between these two measurements. The comparison of values revealed the mean (SD) serum creatinine at NHANES, CCF, and their difference were 1.177 (0.315), 0.947 (0.302), and 0.231(0.066) mg/dL, respectively (paired t-test, $p<0.0001$). The Deming regression (adjusting for errors in measurement) for the correction is Standard Creatinine (Y) = 0.960*NHANES Creatinine (X) – 0.184 (r = 0.978).

CHP: Serum cholesterol

This value was obtained from the standard battery of biochemical assessments. Use of the laboratory test result from the reference method (TCP), rather than the CHP value, is generally recommended.For most analyses of serum cholesterol, the appropriate variable to use will be TCP. The value from the biochemistry profile (CHP) should not be used routinely. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996) for the details.

COP: Serum cotinine

Only cotinine results from 1988-1991 are included in this field.

DHP: Serum hepatitis D antibody

Hepatitis B virus testing scheme: From 1988-1991, all sera were tested for the core antibody to hepatitis B virus (anti-HBc). If this test was positive, the sera were tested for the hepatitis B surface antigen (HBsAg) and hepatitis B surface antibody (anti-HBs). If the HbsAg test was positive and the anti-HBs test was <10 mIU, then the antibody to hepatitis D virus (anti-HDV) test was performed. If the HbsAg test was negative and the anti-HBs test was <10 mIU, then the anti-HBc test was repeated for confirmation.

In June 1993, all sera were tested for both anti-HBc and anti-HBs. Sera testing positive for anti-HBc were tested further for HBsAg, and positive HBsAg samples were tested for anti-HDV.

EOP: Eosinophil cells

See note for ANP.

FEP: Serum iron

Laboratory methods differed between NHANES III and previous surveys. Therefore, results may not be comparable between surveys. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996).

FOP: Serum folate

Laboratory methods differed between NHANES III and previous surveys. Therefore, results may not be comparable between surveys. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996).

G1P: Plasma glucose (first venipuncture)

Plasma glucose was measured using the reference method on examinees aged 20 years and older. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996) for details.

During NHANES III, OGTT testing was conducted on MEC examinees aged 40-74 years. A random assignment was made prior to conducting the OGGT to determine who should receive a morning examination (NCHS, 1994; U.S. DHHS, 1996). As a result, approximately half of the OGGT examinees received the morning OGTT after an overnight fast. This subsample most closely conformed to the World Health Organization (WHO) criteria for OGTT testing to identify diabetes (WHO, 1995). Therefore, this morning subsample is the NHANES III subsample that should be used to estimate the prevalence of diabetes and impaired glucose tolerance. People who reported a medical history of diabetes but who were not using insulin therapy were asked to conform to the fasting instructions for their examination session and were eligible for an OGTT if the age criteria were satisfied. The morning sample weights (WTPFHSD6) for total NHANES III weights for the morning OGTT subsample should be used when weighting these data to generate national estimates. Data from the afternoon and evening OGTTs do not conform to the WHO protocol for diagnosing diabetes or IGT and should not be used for these purposes.

If an examinee was given an OGTT during an examination session other than the session assigned, that examinee's sample weight for the assigned session will be zero. For example, if an examinee was selected for a morning OGTT but was tested in the afternoon, the examinee's morning sample weight for the OGTT will be zero.

G1PCODE: Reasons for an incomplete glucose tolerance test

The reason for which an examinee aged 40-74 years did not complete the OGTT was entered in this field. This field either will contain an incomplete OGTT code or will be blank. Examinees who responded affirmatively to the hemophilia question (code 20) or who received chemotherapy within the past four weeks (code 21) were excluded from venipuncture. Examinees who reported on their examination day that they used insulin therapy (code 22) were excluded from the OGTT. Codes 23-27 were recoded from comments and notations on the questionnaires and may not include complete data on these reasons.

G1PTIM1: Interval between glucose drink and second venipuncture in minutes

If an examinee was aged 40-74 years and received the OGTT, the time that the glucose drink was consumed and the time of the second venipuncture were recorded. This variable contains the calculated time difference between the glucose drink consumption and the second venipuncture.

G1PTIM2: Interval between first and second venipuncture in minutes

If an examinee was aged 40-74 years and received the OGTT, two timed venipunctures were performed. This variable contains the calculated time difference between the first and second venipunctures.

G2P: Plasma glucose (second venipuncture)

See notes for C1P and G1P.

GBP: Serum globulin

Globulin results were added to the protocol after NHANES III began. This result field was blank-filled for examinees who were examined prior to the start of testing.

GGPSI: Serum gamma glutamyl transferase

Gamma glutamyl transferase results were added to the protocol after NHANES III began. This result field was blank-filled for examinees who were examined prior to the start of testing.

GHP: Glycated hemoglobin (HbA1c)

Glycohemoglobin measurements for NHANES III were performed by the Diabetes Diagnostic Laboratory at the University of Missouri -- Columbia using the Diamat Analyzer System (Bio-Rad Laboratories, Hercules, CA). This ion-exchange HPLC system measures HbA1c (a specific glycohemoglobin) and has demonstrated excellent, long-term precision (interassay CV's 2.0). It was standardized to the reference method that was used for the Diabetes Control and Complications Trial (DCCT). Variant hemoglobins, including hemoglobin C, D, F, and elevated HbF, can interfere with HbA1c measurement by the Diamat HPLC. Hemoglobin S in its heterozygous state does not interfere with this assay. Although interferences usually can be detected by an abnormal Diamat chromatogram, HbA1c results for these specimens were not considered valid. Therefore, samples containing hemoglobin variants or elevated HbF or samples that produce chromatograms indicating hemoglobin degradation were analyzed by an alternate method that used affinity chromatography to separate glycohemoglobin. Affinity chromatographic methods were not affected by the presence of hemoglobin variants and were less sensitive to hemoglobin degradation due to improper sample handling. The affinity method used also was standardized to the DCCT reference method. Reasons for using the affinity method for an examinee's test included an extra peak on the chromatogram, hemoglobin C, elevated hemoglobin F, or other abnormal hemoglobin.

GHPMETH: Glycated hemoglobin method

See note for GHP.

GRP: Granulocyte number

Consult the Manual for Medical Technicians for the Coulter granulocyte number, lymphocyte number, mononuclear number, white blood cell count, red blood cell count, and platelet count units (U.S. DHHS, 1996).

GRPDIF: Segmented neutrophil cells

See note for ANP.

HBP: Serum hepatitis B core antibody

See note for DHP.

HGP: Hemoglobin

In NHANES I, NHANES II, and HHANES, determinations of red and white blood cell counts were made using a semiautomated cell counter Coulter model FN). Determinations of hemoglobin concentration (Hb) were made using a Coulter hemoglobinometer, and determinations of packed cell volume (PCV) were made using the microhematocrit centrifuge method. The hematologic indices MCH, MCHC, and MCV were calculated as follows:

MCH = Hb/RBC
MCHC= Hb/PCV
MCV = PCV/RBC

In NHANES III, these hematologic parameters were determined by using a fully automated Coulter S+JR hematology analyzer.These analyzers measured the mean (red) cell volume (MCV) directly, utilizing a process of continuous integration of pulse heights divided by the pulse number; PCV values were calculated through the multiplication of MCV and RBC.

Although it has been shown that identified errors in the microhematocrit method caused by plasma trapping and red cell dehydration approximately compensate each other (Bull, 1990), packing errors can occur in macrocytic anemia and can be considerable in sickle cell anemia, spherocytosis, and thalassemias (NCCLS, 1993). Therefore, individual values for MCV, PCV ("hematocrit"), and MCHC from NHANES III cannot be compared directly to values from the previous NHANES.

HPP: Serum Helicobacter pylori antibody

H. pylori antibody testing was performed on surplus sera from children and adolescents aged 6-19 years. This result field was blank-filled for examinees aged 6-19 years for whom surplus specimens were not available for testing. Due to variability in the laboratory test(Pylori Stat, Whittaker Bioproducts, Inc.), 50 percent of the assays were repeated randomly. There was a seven-percent error rate in which the first result (HPP) did not match the repeat result (HPQ). The original result was kept if the controls on the ELISA plate were within the acceptable range. Testing on adults will be performed at a later date using the same assay.

HTP: Hematocrit

See note for HGP.

HZP: Hypochromia

See note for ANP.

I1P: Serum insulin (first venipuncture)

This is the adjusted insulin value for examinees. Most of the Insulin values in NHANES III (1988-1991) were adjusted because the manufacturer of the laboratory testing kits changed during that period. An indicator of the kit number is located in the I1P2PFLG field (i.e., 1 = Kit 1, 2 = Kit 2, and 3 = Kit 3). All insulin values from Kit 1 and Kit 2 assays were adjusted linearly to match the Kit 3 numbers. Further information on this adjustment procedure is available in the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996).

The equations used to adjust the data were:

Kit 3 = 0.787 (Kit 1) + 0.832 Equation 1
Kit 3 = 0.597 (Kit 2) + 1.746 Equation 2

The following steps were used to make the adjustment:

1. Equation 1 was applied to group 1 (Kit 1) data
2. Equation 2 was applied to group 2 (Kit 2) data
3. Group 3 data (Kit 3) were left unchanged.

The time periods for the insulin kits were as follows:

Group	Assay Period	Assay Method
1	10/88-01/05/90	Kit 1
2	01/06/90-09/06/90	Kit 2
3	11/01/90-end of study	Kit 3

See note for C1P.

I1P2PFLG: Insulin adjustment flag

This field shows which kit was used for the original insulin measurement.

I2P: Serum insulin (second venipuncture)

See notes for C1P, C2P and I1P.

ICPSI: Serum normalized calcium

This variable contains the normalized calcium value derived from adjusting the measured ionized calcium for pH. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996) for details.

L1P: Serum latex antibody

Latex antibody testing was performed on surplus sera from persons ages 17-60 years who were examined in phase 1 (1988-91). This result field was blank-filled for examinees ages 17-60 years for whom surplus specimens were not available for testing.

LAP: Atypical lymphocyte cells

See note for ANP.

LCP: Serum LDL cholesterol calculation

The value for LDL was calculated by the Friedewald equation as follows:

LDL = total cholesterol - high density cholesterol - triglyceride/5.

Because the equation is not valid when serum triglyceride values exceed 400 mg/dL, the LDL is missing when serum triglyceride (TGP) exceeds 400 mg/dL.

Serum LDL was calculated on examinees who were instructed to fast (ages 12 and older) and who did fast at least nine hours, were examined in the morning, and were randomly assigned to the morning fasting sample (WTPFHSD6 > 0). Therefore, LDL would be blank if examinees were aged less than 12 years, fasted fewer than nine hours, were examined in an afternoon or evening session, or were not randomly assigned to the morning session. For the purpose of this calculation, the number of hours fasted was rounded to the nearest whole integer.

For more information regarding this equation, refer to the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996).

LMP: Lymphocyte number

See note for GRP.

LMPDIF: Lymphocyte cells

See note for ANP.

LUP: Serum lutein/zeaxanthin

The lower limit of detection (LOD) for lutein/zeaxanthin was 0.43 ug/dL. Using the LOD coding formula (detection limit divided by the square root of two), the calculated value indicating that the

serum lycopene results were below the level of detection would be 0.30. After rounding, the value of 0 (zero) was placed in the results field to indicate that the serum lutein/zeaxanthin was below 0.43 ug/dL.

LYP: Serum lycopene

The lower limit of detection (LOD) for lycopene was 0.63 ug/dL. Using the LOD coding formula (detection limit divided by the square root of two), the calculated value indicating that the serum lycopene results were below the level of detection would be 0.44. After rounding, the value of 0 (zero) was placed in the results field to indicate that the serum lycopene was below 0.63 ug/dL.

MCPSI: Mean cell hemoglobin

See note for HGP.

MEP: Metamyelocyte cells

See note for ANP.

MHP: Mean cell hemoglobin concentration

See note for HGP.

MIP: Microcytosis

See note for ANP.

MLP: Myelocyte cells

See note for ANP.

MOP: Mononuclear number

See note for GRP.

MOPDIF: Monocyte cells

See note for ANP.

MRP: Macrocytosis

See note for ANP.

MVPSI: Mean cell volume

See note for HGP.

OSPSI: Serum osmolality

Results for osmolality were added to the protocol after NHANES III began. This result field is blank-filled for examinees who were examined prior to the start of testing.

PHPBEST: Time of venipuncture

The time of venipuncture is expressed using the 24-hour clock system (military time) in which 01:00 corresponds to 1:00 a.m., 12:00 corresponds to 12 noon, 13:00 corresponds to 1:00 p.m., and 00:00 corresponds to 12 midnight.

PHPCHM2: Within the past four weeks have you received any cancer chemotherapy treatment?

All examinees who indicated at the time of venipuncture that they had received cancer chemotherapy treatment in the past two weeks (later this was changed to four weeks) were excluded from venipuncture. For these examinees, results fields for blood-based analyses are blank-filled.

PHPFAST: Calculated fasting time in hours

The fasting time was calculated using the time of venipuncture and the time the examinee last ate or drank (other than water). This was determined using the snack/drink time and the corresponding day variables. Fasting time is the elapsed interval between the time the examinee last ate or drank and the time of venipuncture.

The following variables were used to calculate this variable: PHPSNTI, PHPSNDA, PHPDRIN, PHPDRTI, PHPDRDA, and PHPBEST. If the examinee drank only water since he/she last ate (PHPDRIN = 2), then the time and day the examinee last ate (PHPSNTI and PHPSNDA) were subtracted from the time and day of the venipuncture (PHPBEST). The difference was the number of hours between the time the examinee last ate and the time of the venipuncture.

If the examinee drank anything other than water (PHPDRIN = 1), then the time and day the examinee last drank (PHPDRTI and PHPDRDA) were subtracted from the time and day of the venipuncture (PHPBEST). The difference was the number of hours between the time the examinee last drank and the time of the venipuncture.

PHPHEMO: Do you have hemophilia?

All examinees who indicated at the time of venipuncture that they had hemophilia, a hereditary blood-clotting disorder, were excluded from the venipuncture. Results for blood analyses were blank-filled.

PINSU: Are you currently taking insulin?

See note for G1P and G1PCODE.

PHPLANG: Language of the venipuncture screening questionnaire

Both English and Spanish versions of the venipuncture screening questionnaire were used. The language used depended on the preference of the examinee. Translators, either hired or friends/family members, were available for examinees who spoke neither Spanish nor English.

PKP: Poikilocytosis

See note for ANP.

PLP: Platelet count

See note for GRP.

POP: Polychromatophilia

See note for ANP.

PRP: Promyelocyte cells

See note for ANP.

PXP: Serum transferrin saturation

This value was calculated as (FEP/ TIP) * 100.

RBP: RBC folate

See note for FOP.

RCP: Red blood cell count

See notes for HGP and GRP.

RUP: Serum rubella antibody

Rubella antibody data are reported both as an optical density index and in International Units. The index was calculated by subtracting the absorbance of the control well from the absorbance of the antigen well (AG-NS) and dividing the difference by the cut-off value. The cut-off value was calculated as the mean AG-NS value of duplicate 10 IU standards. The equation used was: O.D. index = (AG-NS)/Cut-off value

An O.D. index greater than or equal to one indicates the presence of antibody.

RUPUNIT: Serum rubella antibody (IU)

Rubella antibody data are reported both as an optical density index and in International Units. International Units were calculated based on a standard curve using a regression analysis of duplicate AG-NS values of 10, 40, & 100 IU standards and their squares. An International Unit value greater than or equal to 10 indicates the presence of antibody.

SAP: Serum hepatitis B surface antigen

See note for HBP.

SEP: Serum selenium

Selenium values were measured on two Perkin-Elmer graphite furnace atomic absorption spectrophotometers (model 3030 and model 5100) during the six-year study. Based on a comparability study using linear models, the results generated using the Model 5100 instrument (from 12/07/90 to 1/13/95) were on average 4.3 percent higher than those from the Model 3030 instrument (used from 10/1/88 to 12/06/90).Since the Model 5100 represented more precise measurements, the model 3030 data were adjusted to make them comparable to the Model 5100. Perkin-Elmer Model 5100 Zeeman-corrected graphite furnace atomic absorption spectrophotometer testing began on 12/07/90. All selenium values measured prior to 12/07/90 were adjusted to the AA5100 values. The formula used was:

New value = 16.795 + 0.902 * original value.

SFP: Serum iron

This value was obtained from the standard battery of biochemical assessments. Use of the laboratory test result from the reference method (FEP), rather than the SFP value, is generally recommended. For most analyses of serum iron, the appropriate variable to use will be FEP. The value from the biochemistry profile (SFP) should not be used routinely. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996) for details. Laboratory test results for SFP were added to the protocol after NHANES III began. This result field was blank-filled for examinees who were examined prior to the start of testing.

SGP: Serum glucose

This value was obtained from the standard battery of biochemical assessments. Use of the laboratory test result for plasma glucose from the reference method (G1P), rather than the SGP value, is generally recommended. For most analyses, the appropriate variable to use will be G1P. The value from the biochemistry profile (SGP) should not be used routinely.Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996) for details.

SHP: Spherocytosis

See note for ANP.

SIP: Sickle cells

See note for ANP.

SSP: Serum hepatitis B surface antibody

See note for HBP.

TGP: Serum triglycerides

Serum triglyceride levels were measured regardless of the examinee's fasting status. Mean serum triglycerides and the distribution of serum triglycerides should be estimated only on examinees who did fast at least nine hours, were examined in the morning, and were randomly assigned to the morning fasting sample (WTPFHSD6 > 0). For the purpose of this calculation, the number of hours fasted was rounded to the nearest whole integer. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996) for details.

TOP: Serum toxoplasmosis antibody

The presence and quantity of antibody to Toxoplasma gondii in the test sample were determined by comparing the optical density of the test sample to a standard curve. A standard curve was constructed using optical density readings from positive control sera obtained from a kit; these readings were calibrated to WHO Toxo 60 serum and read as International Units (IU/mL). Those test samples exhibiting titer below 7 IU/mL indicated a non-significant level of antibody according to this technique; thus, they were considered to be negative, indicating no infection. Those test samples with results greater than 6 IU/mL were considered to be positive, indicating infection at some undetermined time.

TRP: Serum triglycerides

This value was obtained from the standard battery of biochemical assessments. Use of the laboratory test result from the reference method (TGP), rather than the TRP value, is generally recommended. For most analyses, the appropriate variable to use is TGP. The value from the biochemistry profile (TRP) should not be used routinely. Consult the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996) for details. Results for TRP were added to the protocol after NHANES III began. This result field was blank-filled for examinees who were examined prior to the start of testing.

TTP: Target cells

See note for ANP.

TXP: Toxic granulation

See note for ANP.

URP: Urinary creatinine

Although the laboratory method detection limit for urinary creatinine is 1 mg/dL, all values below 10 mg/dL were considered "statistically suspect" and were coded as "below level of detection".

VCP: Serum vitamin C

For NHANES III, serum concentrations of vitamin C were measured using a total vitamin C, fully reduced method using high-performance liquid chromatography with electrochemical detection (HPLC-EC) analysis. This method differed from the 2,4-dinitrophenyl hydrazine colorimetric method used in the NHANES II study. A comparison study of the two methods was carried out. Linear regression analysis, by an error in both variables' technique, was used to compare the results obtained by the two methods; values for slope, intercept, and correlation coefficient were 0.881, 0.036, and 0.927, respectively, for 138 singlet analyses.

Serum concentrations obtained by HPLC-EC were lower than those obtained by the 2,4-DNPH method.This difference was expected due to the increased specificity of the HPLC method. Unlike colorimetric methods, HPLC separates uric acid and other potential interferers from ascorbate, thereby increasing accuracy and specificity. The 2,4-DNPH method also measured endogenous diketogulonate, the product of the irreversible oxidation of dehydroascorbic acid. This species was not measured by most HPLC methods and generally was not included in total vitamin C measurements since it has no vitamin C activity. Because the laboratory method differed between NHANES III and NHANES II, the results from the two surveys are not comparable.

Blocks of vitamin C data are missing due to an inadvertent misdilution of the ascorbic acid-serum ratio.

VEP: Serum vitamin E

The vitamin E value of 9999 was confirmed.

VRP: Serum varicella antibody

Varicella antibody data were reported as an optical density index. See note RUP for the index calculation. The equation used was:

O.D. index = (AG-NS)/Cut-off value

The cut-off value was 0.1. An O.D. index equal to or greater than one indicates the presence of antibody.

VUP: Vacuolated cells

See note for ANP.

WCP: White blood cell count

See note for HGP and GRP.

Appendix 1. Blood and Urine Assessments by Specimen Type and Age Group

AGE GROUP		
1-3 years	4-5 years	6-11 years
	Whole blood	
CBC (1)(5)	CBC (1) (5)	CBC (1) (5)
Differential smear	Differential smear	Differential smear
Lead (5)	Lead (5)	Lead (5)
Protoporphyrin (5)	Protoporphyrin (5)	Protoporphyrin (5)
	RBC folate	RBC folate
	Glycated hemoglobin (5)	Glycated hemoglobin (5)
	Serum	
Iron (5)	Iron (5)	
TIBC (5)	TIBC (5)	Iron (5)
Ferritin (5)	Ferritin (5)	TIBC (5)
	Folate (5)	Ferritin (5)
	Apolipoprotein AI(4)(5)	Folate (5)
	Apolipoprotein B(4)(5)	Apolipoprotein AI(4)(5)
	Cholesterol (5)	Apolipoprotein B(4)(5)
	HDL/LDL (5)	Cholesterol (5)
	Triglycerides (5)	HDL/LDL (5)
	Lp(a)(2)(5)	Triglycerides (5)
	Cotinine (4)	Lp(a)(2)(5)
	C-reactive protein (5)	Cotinine (4)
	Vitamin A (5)	C-reactive protein (5)
	Carotenes (5)	Vitamin A (5)
		Carotenes (5)
	Retinyl esters (5)	Retinyl esters (5)
	Vitamin E (5)	Vitamin E (5)
	Vitamin B12 (2)	Vitamin B12 (2)
		Helicobacter pylori (4)
	Tetanus	Tetanus
		Vitamin C
		Hepatitis A

Appendix 1. Blood and Urine Assessments by Specimen Type and Age Group (continued)

AGE GROUP		
1-3 years	4-5 years	6-11 years
	Serum (continued)	Hepatitis B/delta
		Hepatitis C
		Hepatitis E
		Rubella (5)
		Varicella (5)
	Urine	
		Cadmium
		Creatinine
		Albumin
		Iodine

Appendix 1. Blood and Urine Assessments by Specimen Type and Age Group (continued)

AGE GROUP	
12-19 years	20 years and older
Whole blood	
CBC (1)(5)	CBC (1)(5)
Differential smear	Differential smear
Lead (5)	Lead (5)
Protoporphyrin (5)	Protoporphyrin (5)
	RBC folate
Glycated hemoglobin (5)	Glycated hemoglobin (5)
Serum	
Iron (5) TIBC	Iron (5)
(5) Ferritin	TIBC (5)
(5) Folate	Ferritin (5)
(5)	Folate (5)
Apolipoprotein AI(4)(5)	Apolipoprotein AI(4)(5)
Apolipoprotein B(4)(5)	Apolipoprotein B(4)(5)
Cholesterol (5)	Cholesterol (5)
HDL/LDL (5)	HDL/LDL (5)
Triglycerides (5)	Triglycerides (5)
Lp(a)(2)(5)	Lp(a)(2)(5)
Cotinine (4)	Cotinine (4)
C-reactive protein (5)	C-reactive protein (5)
Vitamin A (5) Carotenes	Rheumatoid factor (60+)
(5)	Vitamin A (5)
Retinyl esters (5)	Carotenes (5)
Vitamin E (5)	Retinyl esters (5)
Vitamin B12 (2)	Vitamin E (5)
Helicobacter pylori (4)	Vitamin B12 (2)
Tetanus	
Vitamin C	Tetanus
Hepatitis A	Vitamin C
Hepatitis B/delta	Hepatitis A
Hepatitis C	Hepatitis B/delta
Hepatitis E	Hepatitis C
Rubella (5)	Hepatitis E
Varicella (5)	Rubella (5)
	Varicella (5)

Appendix 1. Blood and Urine Assessments by Specimen Type and Age Group (continued)

AGE GROUP	
12-19 years	20 years and older
Serum	
Diphtheria	Diptheria
Herpes simplex I and II	Herpes simplex I and II
HIV I (ages 18+)(3)(5)	HIV I (ages 18+)(3)(5)
Toxoplasmosis (5) Vitamin D (OHD) Total/normalized calcium Selenium (5)	Toxoplasmosis (5) Vitamin D (OHD) Total/normalized calcium Selenium (5)
Thyroxine (T4)	Thyroxine (T4)
Thyroid-stimulating hormone	Thyroid-stimulating hormone
Antithyroglobulin antibodies	Antithyroglobulin antibodies
Antimicrosomal antibodies	Antimicrosomal antibodies
	FSH/LH (females aged 35-60 years)
	Insulin (6)
Biochemistry profile (5)	C-peptide (6)
Bicarbonate	Biochemistry profile (5)
Blood urea nitrogen	Bicarbonate
Total bilirubin	Blood urea nitrogen
Alkaline phosphatase	Total bilirubin
Cholesterol	Alkaline phosphatase
AST	Cholesterol
ALT	AST
LDH	ALT
GGT	LDH
Total protein	GGT
Albumin	Total protein
Creatinine	Albumin
Glucose	Creatinine
Calcium	Glucose
Chloride	Calcium
Uric acid	Chloride
Phosphorus	Uric acid
Sodium	Phosphorus
Potassium	Sodium
Triglycerides	Potassium
Globulin	Triglycerides
Iron	Globulin
Osmolality	Iron
	Osmolality

Appendix 1. Blood and Urine Assessments by Specimen Type and Age Group (continued)

AGE GROUP	
12-19 years	20 years and older
Plasma	
	Glucose (examinees aged 20-39 years and 75 years and older) OGTT (examinees aged 40-74 years) Fibrinogen (examinees aged 40 years and older)(5)
Urine	
Cadmium	Cadmium
Creatinine	Creatinine
Albumin	Albumin
Iodine	Iodine
Urine drug (ages 18 years and over)(2)(3) Cocaine Opiates Phencyclidine Amphetamines Marijuana	Urine drug (examinees aged 18 years and over)(2)(3) Cocaine Opiates Phencyclidine Amphetamines Marijuana Pregnancy test (females aged 20-59 years)
White Cells	
Storage/banking (5)	Storage/banking (5)

(1) Includes hematocrit, hemoglobin, red, white and platelet cell counts, mean cell volume, mean cell hemoglobin, mean cell hemoglobin concentration, red cell distribution width, platelet distribution width, mean platelet volume, and 3-cell differential
(2) Phase 2 only
(3) Anonymous
(4) Phase 1 only
(5) Home examination also
(6) In phase 2, also from second venipuncture for examinees aged 40-74 years

Appendix 2. Laboratory Test Detection Limits

Test	Detection limit
Albumin (urine)	0.5 ug/mL
Alpha carotene	0 ug/dL
Antimicrosomal antibody (AMA)	0.5 U/mL
Antithyroglobulin antibody (ATA)	1.0 U/mL
Beta carotene	0.67 ug/dL
Beta cryptoxanthin	0 ug/dL
C-peptide	0.03 pmol/mL
C-reactive protein	0.3 mg/dL
Cadmium (urine)	0.01 ng/mL
Cotinine Creatinine	0.05 ng/mL
(urine)	1 mg/dL
Erythrocyte protoporphyrin	2.5 ug/dL RBC
Ferritin	3 ng/mL
Folate (serum)	0.2 ng/mL
Follicle stimulating hormone (FSH)	0.15 IU/L
Glucose	2 mg/dL
Glycated hemoglobin	0 %
Hematology parameters	
Granulocyte	0 %
Granulocyte (1)	0 number
Hematocrit	0 %
Hemoglobin	0 g/dL
Lymphocyte	0 %
Lymphocyte (1)	0 number
Mean cell hemoglobin	0 pg
Mean cell hemoglobin concentration	0 g/dL
Monocyte	0 %
Monocyte (1)	0 number
Platelet count (1)	0
Platelet distribution width	0 %
Red blood cell count (RBC) (1)	0
Red blood cell distribution width	0 %
White blood cell count (WBC) (1)	0
Hepatitis profile	Qualitative tests
Herpes	Qualitative tests
High density lipoprotein (HDL)	10 mg/dL
Human immunodeficiency virus (HIV)	Qualitative tests
Insulin	2.5 uU/mL
Iodine (urine)	0.2 ug/dL
Iron	3.0 ug/dL
Lead	1 ug/dL
Lipoprotein(a)	0 mg/dL
Lutein/zeaxanthin	0.43 ug/dL

Appendix 2. Laboratory Test Detection Limits (continued)

Test	Detection limit
Luteinizing hormone (LH)	0.15 IU/L
Lycopene	0.63 ug/dL
Normalized calcium	0.5 mmol/L
RBC folate Retinyl	4.4 ng/mL
esters Rheumatoid	0 ug/dL
factor Rubella	Qualitative tests
Selenium	0 IU
Tetanus	8 ng/mL
Thyroid stimulating hormone (TSH)	0 U/mL
Thyroxine (T4)	0.01 mU/mL
Total iron binding capacity (TIBC)	1.0 ug/dL
Total cholesterol	9 ug/dL
Total calcium	10 mg/dL
Toxoplasmosis	1.5 mmol/L
Triglycerides	0 IU
Varicella	10 mg/dL
Vitamin B12	0
Vitamin E	20 pg/mL
Vitamin C	20 ug/dL
Vitamin A	0 mg/dL
Vitamin D	0.5 ug/dL
	5.0 ng/mL

(1) Units for white blood cell count, red blood cell count, platelet count, lymphocyte number, granulocyte number, and mononuclear number are referenced in the Manual for Medical Technicians p. 5-1 (U.S. DHHS, 1996).

Note: Lower detection limits for analytes included in the general "biochemistry profile" are found in the Laboratory Procedures Used for NHANES III (U.S. DHHS, 1996).

Appendix 3. NHANES III SI Table

Test (1)	NHANES Unit	NHANES Format	Conversion Factor	SI Unit	SI Format
Alanine aminotransferase(2)	N/A	N/A	N/A	U/L	XXX
Albumin (serum) (2)	g/dL	X.X	10	g/L	XX
Albumin (urine)	ug/mL	XXXXX.XX	N/A	N/A	N/A
Alkaline phosphatase (2)	N/A	N/A	N/A	U/L	XXX
Alpha carotene	ug/dL	XXX	0.01863	umol/L	X.XX
Antimicrosomal antibody	N/A	N/A	N/A	N/A	N/A
Antithyroglobulin antibody	N/A	N/A	N/A	N/A	N/A
Apolipoprotein AI	mg/dL	XXX	0.01	g/L	X.XX
Apolipoprotein B	mg/dL	XXX	0.01	g/L	X.XX
Aspartate amino-transferase (2)	N/A	N/A	N/A	U/L	XXX
Beta carotene	ug/dL	XXX	0.01863	umol/L	XX.XX
Beta cryptoxanthin	ug/dL	XXX	0.01809	umol/L	X.XX
Bicarbonate (2)	N/A	N/A	N/A	mmol/L	XX
Bilirubin (total)(2)	mg/dL	XXX.XX	XX.X	17.1	umol/L
Blood urea nitrogen (2)	mg/dL	XXX	0.357	mmol/L	XX.XX
C-peptide	pmol/mL	XX.XXX	1	nmol/L	XX.XXX
C-reactive protein	N/A	N/A	N/A	N/A	N/A
Cadmium (urine)	ng/mL	XX.XX	8.897	nmol/L	XXX.XX
Calcium (total)	N/A	N/A	N/A		mmol/L
Calcium (normalized)	N/A	X.XX	N/A	N/A	N/A
Calcium (2)	mmol/L	X.XX	0.25	mmol/L	X.XX
Chloride (2)	N/A	N/A	N/A	mmol/L	XXX.X
Cholesterol	mg/dL	XXX	0.02586	mmol/L	XX.XX
Cholesterol (HDL)	mg/dL	XXX	0.02586	mmol/L	X.XX
Cholesterol (LDL)	mg/dL	XXX	0.02586	mmol/L	X.XX
Cholesterol (2)	mg/dL	XXX	0.02586	mmol/L	XX.XXX
Cotinine	ng/mL	XXXX.XXX	N/A	N/A	N/A
Creatinine (2)	mg/dL	XX.X	88.4	umol/L	XXXX.X
Creatinine (urine)	mg/dL	XXX.X	0.0884	mmol/L	XX.X
Diphtheria	N/A	N/A	N/A	N/A	N/A
Ferritin	ng/mL	XXXX	1	ug/L	XXXX
Fibrinogen	mg/dL	XXX	0.01	g/L	X.XX
Folate	ng/mL	XXX.X	2.266	nmol/L	XXX.X
Folate (RBC)	ng/mL	XXXX	2.266	nmol/L	XXXX.X
Follicle-stimulating hormone	N/A	N/A	N/A	IU/L	XXX.X
GGT (2)	N/A	N/A	N/A	U/L	XXXX

Appendix 3. NHANES III SI Table

Test (1)	NHANES Unit	NHANES Format	Conversion Factor	SI Unit	SI Format
Globulin (2)	g/dL	X.X	10	g/L	XX
Glucose (2)	mg/dL	XXX	0.05551	mmol/L	XX.XX
Glucose (plasma)	mg/dL	XXX.X	0.05551	mmol/L	XX.XXX
Glycated hemoglobin	%	XX.X	N/A	N/A	N/A
Helicobacter pylori	N/A	N/A	N/A	N/A	N/A
Hematocrit	%	XX.XX	0.01	L/L=1	0.XXX
Hemoglobin	g/dL	XX.XX	10	g/L	XXX.X
Hepatitis A virus	N/A	N/A	N/A	N/A	N/A
Hepatitis B core antibody (anti-HBc)	N/A	N/A	N/A	N/A	N/A
Hepatitis B surface antigen (HbsAg)	N/A	N/A	N/A	N/A	N/A
Hepatitis C virus	N/A	N/A	N/A	N/A	N/A
Hepatitis D virus	N/A	N/A	N/A	N/A	N/A
Hepatitis B surface antibody (anti-HBs)	N/A	N/A	N/A	N/A	N/A
Herpes I & II	N/A	N/A	N/A	N/A	N/A
Homocysteine	N/A	N/A	N/A	umol/L	XX.X
Human immuno-deficiency virus	N/A	N/A	N/A	N/A	N/A
Insulin	uU/mL	XXX.XX	6.0	pmol/L	XXX.XX
Iodine (urine)	ug/dL	XXX.X	N/A	N/A	N/A
Iron	ug/dL	XXX	0.1791	umol/L	XX.XX
Iron (2)	ug/dL	XXX	0.1791	umol/L	XX.X
LDH (2)	N/A	N/A	N/A	U/L	XXX
Latex antibody	IU/mL	XXXX.XX	N/A	N/A	N/A
Lead	ug/dL	XX.X	0.04826	umol/L	X.XXX
Lipoprotein(a)	mg/dL	XXX	0.01	g/L	X.XX
Lutein/zeaxanthin	ug/dL	XXX	0.01758	umol/L	X.XX
Luteinizing hormone	N/A	N/A	N/A	IU/L	XX.X
Lycopene	ug/dL	XXX	0.01863	umol/L	X.XX
Mean cell hemoglobin	N/A	N/A	N/A	pg	XX.XX
Mean cell volume	N/A	N/A	N/A	fL	XXX.XX
Mean cell hemoglobin concentration	g/dL	XX.XX	10	g/L	XXX.X
Mean platelet volume	N/A	N/A	N/A		fL
	XX.XX	Methylmalonic acid		ug/dL	N/A
	0.085	umol/L	N/A		

Appendix 3. NHANES III SI Table (continued)

Test (1)	NHANES Unit	NHANES Format	Conversion Factor	SI Unit	SI Format
Osmolality (2)	N/A	N/A	N/A	mmol/kg	
Phosphorus (2)		XXX	XX.X	0.3229	mmol/L
Platelet count (3)		X.XXX	XXX.X	1	N/A
Potassium (2)		XXX.X	N/A	N/A	mmol/L
Protein (total)(2)		X.XX	XX.X	10	g/L
Protoporphyrin		XXX	XXXX	0.0178	umol/L
Red blood cell distribution width		XX.XX			
Red blood cell count (3)	%	XX.XX	0.01	fraction	X.XXXX
Retinyl esters	N/A	X.XX	1	N/A	X.XX
Rheumatoid factor	ug/dL	XXX	0.03491	umol/L	X.XX
Rubella	N/A	N/A	N/A	N/A	N/A
Selenium	N/A	N/A	N/A	N/A	N/A
Sodium (2)	ng/mL	XXX	0.0127	nmol/L	X.XX
Tetanus	N/A	N/A	N/A	mmol/L	XXX.X
Thyroid stimulating hormone	U/mL	N/A	N/A	N/A	N/A
Thyroxine	uU/mL	XXX.XX	1	mU/L	XXX.XX
Total iron binding capacity	ug/dL	XX.X	12.87	nmol/L	XXX.X
Toxoplasmosis	ug/dL	XXX	0.1791	umol/L	XXX.XX
Triglycerides	N/A	N/A	N/A	N/A	N/A
Triglycerides (2)	mg/dL	XXXX	0.01129	mmol/L	XX.XX
Uric acid (2)	mg/dL	XXXX	0.01129	mmol/L	XX.XXX
Varicella	mg/dL	XX.X	59.48	umol/L	XXX.X
Vitamin A	N/A	N/A		N/A	N/A
Vitamin B12		N/A	ug/dL XXX	0.03491	umol/L
Vitamin C		X.XX	pg/mL XXXXX	0.7378	pmol/L
Vitamin D		XXXXX.XX	mg/dL	X.XX	56.78
Vitamin E		mmol/L	XXX.XX ng/mL		XXX.X
White blood cell count (3)		2.496	nmol/L	XXX.X ug/dL	
		XXXX	0.02322	umol/L	XXX.XX
	N/A	XX.XX	1	N/A	XX.XX

(1) Results are based on a serum sample unless otherwise noted.
(2) Biochemistry profile
(3) Units for white blood cell count, red blood cell count, platelet count, lymphocyte number, granulocyte number, and mononuclear number are referenced in the Manual for Medical Technicians p. 5-1 (U.S. DHHS, 1996).

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