National Health and Nutrition Examination Survey 2003-2004

Documentation, Codebook, and Frequencies

MEC Laboratory Component: Urinary Albumin and Urinary Creatinine

Survey Years:
2003 to 2004

SAS Export File:
L16_C.XPT

January 2006

NHANES 2003–2004 Data Documentation

Laboratory Assessment: Lab 16 – Urinary Creatinine and Albumin

Years of Coverage: 2003–2004 **First Published:** January 2006 **Last Revised:** January 2006

Component Description

Urinary albumin and creatinine are measured. Related survey questionnaire data include information on analgesic product use and incontinence.

Eligible Sample

Participants aged 6 years and older.

Description of Laboratory Methodology

Urinary Creatinine

Creatinine analysis uses a Jaffé rate reaction, in which creatinine reacts with picrate in an alkaline solution to form a red creatinine-picrate complex. The reaction is measured with a CX3 analyzer. The rate of the color development is measured 25.6 sec after sample injection at 520 and 560 nm. The rate difference between the two wavelengths is proportional to the concentration of creatinine in the reaction cup. The procedures described below are the standard protocols of the Fairview University Medical Center (1–5).

Creatinine, the waste product derived from creatine, is released into the plasma at a relatively constant rate. The amount of creatinine per unit of muscle mass is constant; therefore, creatinine is the best indicator of impaired kidney function.

Urinary Albumin

A solid-phase fluorescent immunoassay for the measurement of human urinary albumin is described by Chavers et al. (6). The fluorescent immunoassay is a non-competitive, double-antibody method for the determination of human albumin in urine. Antibody to human albumin is covalently attached to derivatized polyacrylamide beads. The solid-phase antibody is reacted with a urine specimen, and the urine albumin-antigen complexes with the solid-phase antibody. This complex then reacts with fluorescein-labeled antibody. The unattached fluorescent antibody is then removed by washing during centrifugation. The fluorescence of the stable solid-phase antibody complex is determined with a fluorometer; the fluorescence is directly proportional to the amount of urine albumin present. The standard curve is 0.5–20 µg/mL of albumin.

Increased microalbuminuria is a sign of renal disease and may be predictive of nephropathy risk in patients with insulin-dependent diabetes. Results of the fluorescent immunoassay (FIA) are reproducible, and the test is accurate and sensitive for the detection of human urinary albumin excretion. It is especially useful for the measurement of low levels of urinary albumin not detectable by dipstick methods. The FIA assay resembles the radio-immunoassay (RIA) in technique and sensitivity without the potential health hazards associated with the handling of isotopes in the laboratory (6).

There were no changes to the equipment, lab method, or lab site from the previous 2 years.

A detailed description of the laboratory method used can be found on the NHANES website.

Laboratory Quality Control and Monitoring

The NHANES quality control and quality assurance protocols (QA/QC) meet the 1988 Clinical Laboratory Improvement Act mandates. Detailed quality control and quality assurance instructions are discussed in the NHANES Laboratory/Medical Technologists Procedures Manual (LPM). Read the LABDOC file for detailed QA/QC protocols.

A detailed description of the quality assurance and quality control procedures can be found on the NHANES website.

Data Processing and Editing

Urine specimens are processed, stored and shipped to University of Minnesota, Minneapolis, MN. Detailed specimen collection and processing instructions are discussed in the NHANES LPM. Read the LABDOC file for detailed data processing and editing protocols. The analytical methods are described in the Analytic methodology section.

Randomly collected or “spot” urine specimens were collected by clean-catch technique into sterile 250-mL polyethylene containers (from a large production lot, previously prescreened for trace element contamination). Although the collection of 24-hour urine specimens is scientifically desirable, it is simply not feasible for survey purposes; thus, the use of spot urine collections has been a necessity. Urine creatinine concentrations from these specimens have been used (instead of a 24-hour volume correction) to correct for the degree of dilution or concentration of some of the urine analytes, such as the phenols or microalbumin.

There was no top coding in this file. Detailed instructions on specimen collection and processing can be found on the NHANES website.

Analytic Notes

The analysis of NHANES 2003–2004 laboratory data must be conducted with the key survey design and basic demographic variables. The NHANES 2003–2004 Questionnaire Data Files contain demographic data, health indicators, and other related information collected during household interview and MEC examination. They also contain sample weights for these age groups. The phlebotomy file includes auxiliary information, such as the conditions precluding venipuncture. The household questionnaire and phlebotomy files may be linked to the laboratory data file using the unique survey participant identifier SEQN.

References

1. Creatinine Measurement Module Operating and Service Instructions, Beckman ASTRA. Brea (CA): Beckman Instruments, Inc., 1979.
2. Operating and Service Instructions, Beckman ASTRA. Brea (CA): Beckman Instruments, Inc., 1986.
3. Maintenance Guide, Beckman ASTRA. Brea (CA): Beckman Instruments, Inc., 1982.
4. Tietz NW, editor, Textbook of Clinical Chemistry. Philadelphia: WB Saunders Company, 1986;775–1392.
5. Kaplan LA, Pesce AJ, editors, Clinical Chemistry Theory, Analysis and Correlation. St. Louis: CV Mosby Company, 1984:416–1261.
6. Chavers BM, Simonson J, Michael AF. A solid-phase fluorescent immunoassay for the measurement of human urinary albumin. Kidney Int. 1984;25:576–578.

Locator Fields

Title: Urinary Creatinine and Albumin

Contact Number: 1-866-441-NCHS

Years of Content: 2003–2004

First Published: January 2006

Revised: January 2006

Access Constraints: None

Use Constraints: None

Geographic Coverage: National

Subject: Urinary Creatinine and Albumin

Record Source: NHANES 2003–2004

Survey Methodology: NHANES 2003–2004 is a stratified multistage probability sample of the civilian non-institutionalized population of the U.S.

Medium: NHANES Web site; SAS transport files

National Health and Nutrition Examination Survey
Codebook for Data Production (2003-2004)

Urinary Albumin and Urinary Creatinine (L16_C)
Person Level Data

April 2006

SEQN	Target
	B(6 Yrs. to 150 Yrs.)
Hard Edits	**SAS Label**
	Respondent sequence number
English Text: Respondent sequence number.	
English Instructions:	

URXUCR	Target
	B(6 Yrs. to 150 Yrs.)
Hard Edits	**SAS Label**
	Creatinine, urine (mg/dL)
English Text: Creatinine, urine (mg/dL)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
6 to 882	Range of Values	7739	7739	
.	Missing	243	7982	

URXUCRSI	Target
	B(6 Yrs. to 150 Yrs.)
Hard Edits	**SAS Label**
	Creatinine, urine (umol/L)
English Text: Creatinine, urine (umol/L)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
530 to 77969	Range of Values	7739	7739	
.	Missing	243	7982	

URXUMA	Target
	B(6 Yrs. to 150 Yrs.)
Hard Edits	**SAS Label**
	Albumin, urine (ug/mL)
English Text: Albumin, urine (ug/mL)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
0.3 to 9870	Range of Values	7738	7738	
0.2	Below Limit of Detection	1	7739	
.	Missing	243	7982	

URXUMASI	Target
	B(6 Yrs. to 150 Yrs.)
Hard Edits	**SAS Label**
	Albumin, urine (mg/L) SI
English Text: Albumin, urine (mg/L) SI	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
0.3 to 9870	Range of Values	7738	7738	
0.2	Below Limit of Detection	1	7739	
.	Missing	243	7982	