

**National Health and Nutrition
Examination Survey 2003-2004**

**Documentation, Codebook,
and Frequencies**

Urinary Perchlorate

Laboratory

**Survey Years:
2003 to 2004**

**SAS Export File:
L04PER_C.XPT**



August 2008

NHANES 2003–2004 Data Documentation

Laboratory Assessment: Lab 4 – Urinary Perchlorate (L04PER_C)

First Published: August 2008

Last Revised: N/A

Component Description Perchlorate has been commonly used as an oxidant in solid fuel propellants for rockets and missiles since the 1950s. Lesser amounts of perchlorate are used in matches and fireworks. Perchlorate can also form naturally in the environment. Improved exposure assessment through biomonitoring enhances resolution for relating perchlorate exposure with health parameters. This data will provide important information for state and federal agencies debating appropriate regulatory limits for perchlorate in drinking water, and provide useful baseline information on the scope of perchlorate exposure in the U.S. population.

Eligible Sample Participants aged 6 years and older on a 1/3 sample were tested.

Description of Laboratory Methodology This method is a quantitative procedure for the measurement of perchlorate in human urine using ion chromatography coupled with electrospray tandem mass spectrometry. Chromatographic separation is achieved using an IonPac AS16 column with 100 mM sodium hydroxide as the eluant. The eluant from the column is ionized using an electrospray interface to generate and transmit negative ions into the mass spectrometer. Comparison of relative response factors (ratio of native analyte to stable isotope labeled internal standard) with known standard concentrations yields individual analyte concentrations. The method is applicable to the determination of perchlorate in 0.5 mL of urine over the range 0.05 to 100 ng/mL.

Laboratory Quality Control and Monitoring Specimens were processed, stored and shipped to Division of Laboratory Sciences, National Center for Environmental Health.

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

Data Processing and Editing

Mobile Examination Centers (MECs)

Laboratory team performance is monitored using several techniques. NCHS and contract consultants use 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 is observed for equipment operation, specimen collection and preparation; testing procedures and constructive feedback are given to each staff. Formal retraining sessions are conducted annually to ensure that required skill levels were maintained.

The NHANES QA/QC protocols meet the 1988 Clinical Laboratory Improvement Act mandates. Detailed QA/QC instructions are discussed in the NHANES LPM.

Analytical Laboratories

NHANES uses several methods to monitor the quality of the analyses performed by the contract laboratories. In the MEC, these methods include performing second examinations on previously examined participants and blind split samples collected on “dry run” sessions. In addition, contract laboratories randomly perform repeat testing on 2.0% of all specimens.

NCHS developed and distributed a quality control protocol for all the contract laboratories which outlined the Westgard rules used when running NHANES specimens. Progress reports containing any problems encountered during shipping or receipt of specimens, summary statistics for each control pool, QC graphs, instrument calibration, reagents, and any special considerations are submitted to NCHS and Westat quarterly. The reports are reviewed for trends or shifts in the data. The laboratories are required to explain any identified areas of concern.

All QC procedures recommended by the manufacturers were followed. Reported results for all assays meet the Division of Laboratory Science’s quality control and quality assurance performance criteria for accuracy and precision (similar to specifications outlined by Westgard (1981)).

Analytic Notes

Subsample weights

Measures of urinary perchlorate were measured in a one third subsample of persons 6 years and over. Special sample weights are required to analyze these data properly. Specific sample weights for this

subsample are included in this data file and should be used when analyzing these data.

Variance estimation

The analysis of NHANES 2003-2004 laboratory data must be conducted with the key survey design and basic demographic variables. The NHANES 2003-2004 Demographic Data File contains demographic and sample design variables. The recommended procedure for variance estimation requires use of stratum and PSU variables (SDMVSTRA and SDMVPSU, respectively) in the demographic data file.

Links to NHANES

This laboratory data file can be linked to the other NHANES 2003-2004 data files using the unique survey participant identifier SEQN.

Detection Limits

The detection limits for urinary perchlorate measures were constant during this two-year period.

Please refer to the Analytic Guidelines for further details on the use of sample weights and other analytic issues.

References None

Locator Fields

Title: L04per_c - Urinary Perchlorate

Contact Number: 1-866-441-NCHS

Years of Content: 2003–2004

First Published: August 2008

Revised: N/A

Access Constraints: None

Use Constraints: None

Geographic Coverage: National

Subject: Urinary Perchlorate

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 Perchlorate (L04PER_C)
Person Level Data**

August 2008



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

| | |
|---|--------------------------------|
| WTSC2YR | Target |
| | B(6 Yrs. to 150 Yrs.) |
| Hard Edits | SAS Label |
| | Environmental C 2 year weights |
| English Text: Environmental C 2 year weights | |
| English Instructions: | |

| Code or Value | Description | Count | Cumulative | Skip to Item |
|-------------------|-----------------|-------|------------|--------------|
| 0 to 456851.11941 | Range of Values | 2544 | 2544 | |
| . | Missing | 68 | 2612 | |

| | |
|--|----------------------------|
| URXUP8 | Target |
| | B(6 Yrs. to 150 Yrs.) |
| Hard Edits | SAS Label |
| | Perchlorate, urine (ng/mL) |
| English Text: Urinary Perchlorate | |
| English Instructions: | |

| Code or Value | Description | Count | Cumulative | Skip to Item |
|---------------|-----------------|-------|------------|--------------|
| 0.05 to 280 | Range of Values | 2522 | 2522 | |
| . | Missing | 90 | 2612 | |

| | | | | |
|--|--------------------|---|-------------------|---------------------|
| URXUP8CA | | Target | | |
| | | B(6 Yrs. to 150 Yrs.) | | |
| Hard Edits | | SAS Label | | |
| | | Urine perchlorate (ug per g creatinine) | | |
| English Text: Urinary Perchlorate creatinine adjusted | | | | |
| English Instructions: | | | | |
| Code or Value | Description | Count | Cumulative | Skip to Item |
| 0.26 to 180 | Range of Values | 2504 | 2504 | |
| . | Missing | 108 | 2612 | |