Document, Codebook, and Frequencies

Perchlorate, Nitrate, and Iodide in Tap Water (WPIN_D)

Laboratory

Survey Years: 2005 to 2006

SAS Transport File: WPIN_D.XPT

April, 2009
Perchlorate, Nitrate, and Iodide in Water (Home Tap Water): By assessing exposure to these three toxicologically-related analytes (perchlorate, nitrate and iodide) in one assay, the relative impact of each chemical on thyroid function can be estimated and thus provide useful information for assessing the potential association between exposure and health effects.

Eligible Sample
Participants aged 12 years and older on a one-half sample had water specimens tested.

Measurements of Perchlorate, Nitrate, and Iodide in Tap Water: This method is a quantitative procedure for the measurement of perchlorate, nitrate and iodide in tap water using ion chromatography coupled with electrospray tandem mass spectrometry.

Chromatographic separation is achieved using an IonPac AS20 column with 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) of unknowns with known standard concentrations yields individual analyte concentrations.

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 blind split samples collected on “dry run” sessions.

NCHS developed and distributed a quality control protocol for all the contract laboratories which outlined the Westgaard 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.

NCHS/Westat is currently reviewing these reports.

Data Processing and Editing

Automated data collection procedures for the survey were introduced in NHANES 2005–2006. In the MECs and analytical laboratories, data for the laboratory component are recorded directly onto a computerized data collection form. The system is centrally integrated, and it allows for ongoing monitoring of much of the data. Although the complete blood count and pregnancy analyses are performed in the MEC laboratory, most analyses are conducted elsewhere by approximately 28 laboratories across the United States.

Guidelines have been developed that provide standards for naming variables, filling missing values, and handling missing records. NCHS staff, assisted by contract staff, has developed data-editing specifications that check data sets for valid codes, ranges, and skip-pattern consistencies and examine the consistency of values between interrelated variables. Comments have been reviewed and recoded. NCHS staff verifies extremely high and low values whenever possible, and numerous consistency checks are performed. Nonetheless, users should examine the range and frequency of values before analyzing data.

Data Editing

The data editing specifications are as follows:
- Age and gender checks
- Total number of observations complete for each field
- No field overlap, truncated values, or atypical results
Direct data entry errors
Abnormal results confirmed by lab
Test algorithm performed
Checked comment codes to resolve missing results and missing records
All missing results and missing MEC-examined records are accounted
Duplicate records were verified and deleted

**Analytic Notes**

Measures of perchlorate, nitrate, and iodide in water were assessed in a subsample of participants aged 12 years and older. Use the special weights (WTSPC2YR) included in this data file when analyzing data. Please refer to the Analytic Guidelines for further details on the use of sample weights and other analytic issues.

The analysis of NHANES 2005-2006 laboratory data must be conducted with the key survey design and basic demographic variables. The recommended procedure for variance estimation requires use of stratum and PSU variables (SDMVSTRA and SDMVPSU, respectively), which are included in the demographic data file for each data release. The NHANES 2005-2006 Household Questionnaire and Demographic Data Files contain demographic data, health indicators, and other related information collected during household interviews. The phlebotomy file includes auxiliary information such as the conditions precluding venipuncture. The demographic, household questionnaire and phlebotomy files may be linked to the laboratory data file using the unique survey participant identifier SEQN.

**Detection limits**

The detection limit was constant for the analytes in the data set. In addition two variables are provided for each of these analytes. The variable named LBD___LC indicates whether the result was below the limit of detection. There are three values: “0”, “1”, and “2”. “0” means that the result was at or above the limit of detection. “1” indicates that the result was below the limit of detection. “2” means the result was above the limit of detection and exceeds calibrated range of assay. The other variable named LBX___ provides the analytic result for that analyte. In cases, where the result was below the limit of detection, the value for that variable is the detection limit divided by the square root of two.
References


Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.
Locator Fields

Title: Perchlorate, Nitrate, and Iodide in Tap Water
Contact Number: 1-866-441-NCHS
Years of Content: 2005-2006
First Published: April 2009
Revised: N/A
Access Constraints: None
Use Constraints: None
Geographic Coverage: National
Subject: Perchlorate, Nitrate, and Iodide in Water
Record Source: NHANES 2005-2006
Survey Methodology: NHANES 2005-2006 is a stratified multistage probability sample of the civilian non-institutionalized population of the U.S.
Medium: NHANES Web site; SAS transport files
### Target
- **SEQN**: Respondent sequence number.

### Hard Edits
- **SAS Label**: Respondent sequence number.

### WTSPC2YR
- **Target**: Two-year MEC weights of water perchlorate.

<table>
<thead>
<tr>
<th>Code or Value</th>
<th>Description</th>
<th>Count</th>
<th>Cumulative</th>
<th>Skip to Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 386575.00873</td>
<td>Range of Values</td>
<td>3435</td>
<td>3435</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Missing</td>
<td>0</td>
<td>3435</td>
<td></td>
</tr>
</tbody>
</table>

### LBXWIO
- **Target**: Iodide, water (ng/mL).

<table>
<thead>
<tr>
<th>Code or Value</th>
<th>Description</th>
<th>Count</th>
<th>Cumulative</th>
<th>Skip to Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.14 to 904</td>
<td>Range of Values</td>
<td>3262</td>
<td>3262</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Missing</td>
<td>173</td>
<td>3435</td>
<td></td>
</tr>
</tbody>
</table>
### LBDWIOLC

<table>
<thead>
<tr>
<th>Code or Value</th>
<th>Description</th>
<th>Count</th>
<th>Cumulative</th>
<th>Skip to Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>At or above the detection limit</td>
<td>3212</td>
<td>3212</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Below lower detection limit</td>
<td>50</td>
<td>3262</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Missing</td>
<td>173</td>
<td>3435</td>
<td></td>
</tr>
</tbody>
</table>

**English Text:** Iodide, water comment code

**English Instructions:**

### LBXWNO

<table>
<thead>
<tr>
<th>Code or Value</th>
<th>Description</th>
<th>Count</th>
<th>Cumulative</th>
<th>Skip to Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>494.97 to 80500</td>
<td>Range of Values</td>
<td>3261</td>
<td>3261</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Missing</td>
<td>174</td>
<td>3435</td>
<td></td>
</tr>
</tbody>
</table>

**English Text:** Nitrate, water (ng/mL)

**English Instructions:**
### Nitrate, water comment code

**English Instructions:**

<table>
<thead>
<tr>
<th>Code or Value</th>
<th>Description</th>
<th>Count</th>
<th>Cumulative</th>
<th>Skip to Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>At or above the detection limit</td>
<td>1781</td>
<td>1781</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Below lower detection limit</td>
<td>1480</td>
<td>3261</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Missing</td>
<td>174</td>
<td>3435</td>
<td></td>
</tr>
</tbody>
</table>

### Perchlorate, water (ng/mL)

**English Instructions:**

<table>
<thead>
<tr>
<th>Code or Value</th>
<th>Description</th>
<th>Count</th>
<th>Cumulative</th>
<th>Skip to Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.07 to 18.2</td>
<td>Range of Values</td>
<td>3262</td>
<td>3262</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Missing</td>
<td>173</td>
<td>3435</td>
<td></td>
</tr>
</tbody>
</table>
**English Text:** Perchlorate, water comment code

**English Instructions:**

<table>
<thead>
<tr>
<th>Code or Value</th>
<th>Description</th>
<th>Count</th>
<th>Cumulative</th>
<th>Skip to Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>At or above the detection limit</td>
<td>2792</td>
<td>2792</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Below lower detection limit</td>
<td>470</td>
<td>3262</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Missing</td>
<td>173</td>
<td>3435</td>
<td></td>
</tr>
</tbody>
</table>