

# National Health and Nutrition Examination Survey

## 2015-2016 Data Documentation, Codebook, and Frequencies

### Volatile Organic Compound (VOC) Metabolites - Urine - Special Sample (UVOCS\_I)

Data File: UVOCS\_I.xpt

First Published: November 2018

Last Revised: NA

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## Component Description

Exposure to volatile organic compounds (VOCs) is ubiquitous. Chronic exposure to extremely high levels of some VOCs can lead to cancer and neurocognitive dysfunction. Urinary metabolites of VOCs can be detectable in urine for a longer period of time than the parent VOCs can be detected in blood.

Nearly 200 air toxicants have been associated with adverse health effects in occupational studies or laboratory studies, but have not been monitored in general population groups. Information on levels of exposure to these compounds, as measured by their metabolite levels in urine, is essential to determine the need for regulatory mechanisms to reduce the levels of hazardous air pollutants to which the general population is exposed.

## Eligible Sample

Examined participants aged 18 years and older from a one-third subsample were eligible. Additionally, to oversample adult smokers, those participants aged 18 years and older, not in the regular one-third subsample, who smoked at least 100 cigarettes in their entire lifetime (SMQ020=1) and now smoke cigarettes every day (SMQ040=1), were also included in this special subsample.

## Description of Laboratory Methodology

This method is a quantitative procedure for the measurement of VOC metabolites in human urine using ultra performance liquid chromatography coupled with electrospray tandem mass spectrometry (UPLC-ESI/MSMS) as described by Alwis et al (2012). Chromatographic separation is achieved using an Acquity UPLC® HSS T3 (Part no. 186003540, 1.8 µm x 2.1 mm x 150 mm, Waters Inc.) column with 15 mM ammonium acetate and acetonitrile as the mobile phases. The eluent 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.

Refer to the Laboratory Method Files section for a detailed description of the laboratory methods used.

There were no changes to the lab method, lab equipment, or lab site for this component in the NHANES 2015-2016 cycle.

## Laboratory Method Files

[Urinary VOC Metabolites Laboratory Procedure Manual](#) (November 2018)

## Laboratory Quality Assurance and Monitoring

Urine specimens are processed, stored, and shipped to the Division of Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta GA for analysis.

Detailed instructions on specimen collection and processing are discussed in the NHANES [Laboratory Procedures Manual \(LPM\)](#). Vials are stored under appropriate frozen ( $-20^{\circ}\text{C}$ ) conditions until they are shipped to National Center for Environmental Health for testing.

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

### Mobile Examination Centers (MECs)

Laboratory team performance is monitored using several techniques. NCHS and contract consultants use a structured competency assessment evaluation during visits to evaluate both the quality of the laboratory work and the quality-control procedures. Each laboratory staff member is observed for equipment operation, specimen collection and preparation; testing procedures and constructive feedback are given to each staff member. Formal retraining sessions are conducted annually to ensure that required skill levels were maintained.

### 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 during “dry run” sessions. In addition, contract laboratories randomly perform repeat testing on 2% of all specimens.

NCHS developed and distributed a quality control protocol for all CDC and contract laboratories, which outlined the use of Westgard rules (Westgard, et al. 1981) 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 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 Sciences’ quality control and quality assurance performance criteria for accuracy and precision, similar to the Westgard rules (Caudill et al., 2008).

## Data Processing and Editing

The data were reviewed. Incomplete data or improbable values were sent to the performing laboratory for confirmation.

## Analytic Notes

Refer to the [2015-2016 Laboratory Data Overview](#) for general information on NHANES laboratory data.

### Subsample Weights

VOC metabolites in urine were measured in a special smoking subsample of participants aged 18 years and older. 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.

### Demographic and Other Related Variables

The analysis of NHANES laboratory data must be conducted using the appropriate survey

design and demographic variables. The NHANES [2015-2016 Demographics File](#) contains demographic data, health indicators, and other related information collected during household interviews as well as the 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.

This laboratory data file can be linked to the other NHANES data files using the unique survey participant identifier (i.e., SEQN).

### **Detection limits**

The detection limits were constant for the analytes in the data set. Two variables are provided for each of these analytes. The variable named ending in "LC" (ex., URDAAMLC) indicates whether the result was below the limit of detection: the value "0" means that the result was at or above the limit of detection, "1" indicates that the result was below the limit of detection. For analytes with analytic results below the lower limit of detection (ex., URDAAMLC=1), an imputed fill value was placed in the analyte results field. This value is the lower limit of detection divided by the square root of 2 ( $LLOD/\sqrt{2}$ ). The other variable prefixed URX (ex., URXAAM) provides the analytic result for the analyte. All data are rounded to three significant figures or three decimal places, whichever is less precise.

The lower limit of detection (LLOD, in ng/mL) for urinary VOC metabolites:

VARIABLE NAME	SAS LABEL	LLOD
URXAAM	N-Acetyl-S-(2-carbamoyl-ethyl)-L-cysteine (ng/mL)	2.20
URXAMC	N-Acetyl-S-(N-methylcarbamoyl)-L-cysteine (ng/mL)	6.26
URXATC	2-Aminothiazoline-4-carboxylic acid (ng/mL)	15.0
URXBMA	N-Acetyl-S-(benzyl)-L-cysteine (ng/mL)	0.500
URXBPM	N-Acetyl-S-(n-propyl)-L-cysteine (ng/mL)	1.20
URXCEM	N-Acetyl-S-(2-carboxyethyl)-L-cysteine (ng/mL)	6.96
URXCYHA	N-Acetyl-S-(1-cyano-2-hydroxyethyl)-L-cysteine (ng/mL)	2.60
URXCYM	N-Acetyl-S-(2-cyanoethyl)-L-cysteine (ng/mL)	0.500
URX1DC	N-Acetyl-S-(1,2-dichlorovinyl)-L-cysteine (ng/mL)	12.6
URX2DC	N-Acetyl-S-(2,2-dichlorovinyl)-L-cysteine (ng/mL)	13.9
URXDHB	N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (ng/mL)	5.25
URXDPM	N-Acetyl-S-(dimethylphenyl)-L-cysteine (ng/mL)	0.500
URXGAM	N-Acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine (ng/mL)	9.40
URXHEM	N-Acetyl-S-(2-hydroxyethyl)-L-cysteine (ng/mL)	0.791
URXHPM	N-Acetyl-S-(3-hydroxypropyl)-L-cysteine (ng/mL)	13.0
URXHP2	N-Acetyl-S-(2-hydroxypropyl)-L-cysteine (ng/mL)	5.30
URXIPM1	N-Acetyl-S-(2-hydroxy-3-methyl-3-butenyl)-L-cysteine + N-Acetyl-S-(2-hydroxy-2-methyl-3-butenyl)-L-cysteine	1.43
URXIPM3	N-Acetyl-S-(4-hydroxy-2-methyl-2-butenyl)-L-cysteine (ng/mL)	1.20
URXMAD	Mandelic acid (ng/mL)	12.0
URX2MH	2-Methylhippuric acid (ng/mL)	5.00
URX34M	3- and 4-Methylhippuric acid (ng/mL)	8.00
URXMB1	N-Acetyl-S-(1-hydroxymethyl-2-propenyl)-L-cysteine (ng/mL)	0.700
URXMB2	N-Acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine (ng/mL)	0.700
URXMB3	N-Acetyl-S-(4-hydroxy-2-butenyl)-L-cysteine (ng/mL)	0.600
URXPHE	N-Acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine (ng/mL)	0.700
URXPHG	Phenylglyoxylic acid (ng/mL)	12.0
URXPMA	N-Acetyl-S-(phenyl)-L-cysteine (ng/mL)	0.600
URXPMM	N-Acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine (ng/mL)	3.00
URXTCV	N-Acetyl-S-(trichlorovinyl)-L-cysteine (ng/mL)	3.00

Please refer to the NHANES [Analytic Guidelines](#) and the on-line NHANES [Tutorial](#) for further details on the use of sample weights and other analytic issues.

## References

- Alwis KU, Blount BC, Britt AS, Patel D, Ashley DL. 2012. Simultaneous analysis of 28 urinary VOC metabolites using ultra high performance liquid chromatography coupled with electrospray ionization tandem mass spectrometry (UPLC-ESI/MSMS). *Anal Chim Acta* 750: 152-160.
- Caudill SP, Schleicher RL, Pirkle JL. Multi-rule quality control for the age-related eye disease study. *Stat Med* 2008;27: 4094-106.
- Westgard J.O., Barry P.L., Hunt M.R., Groth T. A multi-rule Shewhart chart for quality control in clinical chemistry. *Clin Chem* (1981) 27: 493-501.

## Codebook and Frequencies

### SEQN - Respondent Sequence Number

<b>Variable Name:</b>	SEQN
<b>SAS Label:</b>	Respondent Sequence Number
<b>English Text:</b>	Respondent Sequence Number.
<b>Target:</b>	Both males and females 18 YEARS - 150 YEARS

## WTFSM - Two Year Smoking Weights

**Variable Name:** WTFSM**SAS Label:** Two Year Smoking Weights**English Text:** Two Year Smoking Weights**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
5682.8332946 to 708016.13026	Range of Values	2389	2389	
0	No Lab Result	73	2462	
.	Missing	0	2462	

## URX1DC - N-acel-S-(1,2-dichlorovinyl)-L-cys(ng/mL)

**Variable Name:** URX1DC**SAS Label:** N-acel-S-(1,2-dichlorovinyl)-L-cys(ng/mL)**English Text:** N-acetyl-S-(1,2-dichlorovinyl)-L-cysteine (ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
8.9	8.9	2261	2261	
.	Missing	201	2462	



## URD1DCLC - N-acel-S-(1,2-dichlorovinl)-L-cys comt

**Variable Name:** URD1DCLC  
**SAS Label:** N-acel-S-(1,2-dichlorovinl)-L-cys comt  
**English Text:** N-acetyl-S-(1,2-dichlorovinyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	0	0	
1	Below lower detection limit	2261	2261	
.	Missing	201	2462	

## URX2DC - N-acel-S-(2,2-dichlorvinyl)-L-cys(ng/mL)

**Variable Name:** URX2DC**SAS Label:** N-acel-S-(2,2-dichlorvinyl)-L-cys(ng/mL)**English Text:** N-acetyl-S-(2,2-dichlorovinyl)-L-cysteine (ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
9.8	9.8	2202	2202	
.	Missing	260	2462	

## URD2DCLC - N-acel-S-(2,2-dichlorvinyl)-L-cys comt

**Variable Name:** URD2DCLC  
**SAS Label:** N-acel-S-(2,2-dichlorvinyl)-L-cys comt  
**English Text:** N-acetyl-S-(2,2-dichlorovinyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	0	0	
1	Below lower detection limit	2202	2202	
.	Missing	260	2462	

## URX2MH - 2-methylhippuric acid (ng/mL)

**Variable Name:** URX2MH  
**SAS Label:** 2-methylhippuric acid (ng/mL)  
**English Text:** 2-methylhippuric acid (ng/mL)  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
3.54 to 10300	Range of Values	2356	2356	
.	Missing	106	2462	

## URD2MHLC - 2-methylhippuric acid comment code

**Variable Name:** URD2MHLC  
**SAS Label:** 2-methylhippuric acid comment code  
**English Text:** 2-methylhippuric acid comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2214	2214	
1	Below lower detection limit	142	2356	
.	Missing	106	2462	

## URX34M - 3-methipurc acd &amp; 4-methipurc acd(ng/mL)

**Variable Name:** URX34M**SAS Label:** 3-methipurc acd & 4-methipurc acd(ng/mL)**English Text:** 3-methylhippuric acid & 4-methylhippuric acid(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
5.66 to 33800	Range of Values	2356	2356	
.	Missing	106	2462	

## URD34MLC - 3-methipurc acd &amp; 4-methipurc acid comt

**Variable Name:** URD34MLC**SAS Label:** 3-methipurc acd & 4-methipurc acid comt**English Text:** 3-methylhippuric acid & 4-methylhippuric acid comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2351	2351	
1	Below lower detection limit	5	2356	
.	Missing	106	2462	

## URXAAM - N-ace-S-(2-carbamoylethyl)-L-cys(ng/mL)

**Variable Name:** URXAAM**SAS Label:** N-ace-S-(2-carbamoylethyl)-L-cys(ng/mL)**English Text:** N-acetyl-S-(2-carbamoylethyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1.56 to 2160	Range of Values	2356	2356	
.	Missing	106	2462	



## URDAAMLC - N-ace-S-(2-carbamoylethyl)-L-cys comt

**Variable Name:** URDAAMLC**SAS Label:** N-ace-S-(2-carbamoylethyl)-L-cys comt**English Text:** N-acetyl-S-(2-carbamoylethyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2354	2354	
1	Below lower detection limit	2	2356	
.	Missing	106	2462	

## URXAMC - N-ace-S-(N-methylcarbamoyl)-L-cys(ng/mL)

**Variable Name:** URXAMC**SAS Label:** N-ace-S-(N-methylcarbamoyl)-L-cys(ng/mL)**English Text:** N-acetyl-S-(N-methylcarbamoyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
4.43 to 3350	Range of Values	2304	2304	
.	Missing	158	2462	

## URDAMCLC - N-ace-S-(N-methlcarbamoyl)-L-cys comt

**Variable Name:** URDAMCLC**SAS Label:** N-ace-S-(N-methlcarbamoyl)-L-cys comt**English Text:** N-acetyl-S-(N-methylcarbamoyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2300	2300	
1	Below lower detection limit	4	2304	
.	Missing	158	2462	

## URXATC - 2-amnothiazolne-4-carbxylic acid(ng/mL)

**Variable Name:** URXATC**SAS Label:** 2-amnothiazolne-4-carbxylic acid(ng/mL)**English Text:** 2-aminothiazoline-4-carboxylic acid(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
10.6 to 2590	Range of Values	2356	2356	
.	Missing	106	2462	

## URDATCLC - 2-amnothiazolne-4-carbxylic acid comt

**Variable Name:** URDATCLC  
**SAS Label:** 2-amnothiazolne-4-carbxylic acid comt  
**English Text:** 2-amnothiazolne-4-carbxylic acid comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2276	2276	
1	Below lower detection limit	80	2356	
.	Missing	106	2462	

## URXBMA - N-acetyl-S-(benzyl)-L-cysteine(ng/mL)

**Variable Name:** URXBMA**SAS Label:** N-acetyl-S-(benzyl)-L-cysteine(ng/mL)**English Text:** N-acetyl-S-(benzyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.354 to 1330	Range of Values	2355	2355	
.	Missing	107	2462	

## URDBMALC - N-acetyl-S-(benzyl)-L-cysteine comt

**Variable Name:** URDBMALC  
**SAS Label:** N-acetyl-S-(benzyl)-L-cysteine comt  
**English Text:** N-acetyl-S-(benzyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2349	2349	
1	Below lower detection limit	6	2355	
.	Missing	107	2462	

## URXBPM - N-acetyl-S-(n-propyl)-L-cysteine(ng/mL)

**Variable Name:** URXBPM  
**SAS Label:** N-acetyl-S-(n-propyl)-L-cysteine(ng/mL)  
**English Text:** N-acetyl-S-(n-propyl)-L-cysteine(ng/mL)  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.85 to 707	Range of Values	2302	2302	
.	Missing	160	2462	



## URDBPMLC - N-acetyl-S-(n-propyl)-L-cysteine comt

**Variable Name:** URDBPMLC  
**SAS Label:** N-acetyl-S-(n-propyl)-L-cysteine comt  
**English Text:** N-acetyl-S-(n-propyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	1855	1855	
1	Below lower detection limit	447	2302	
.	Missing	160	2462	

## URXCEM - N-acetyl-S-(2-carboxyethyl)-L-cys(ng/mL)

**Variable Name:** URXCEM  
**SAS Label:** N-acetyl-S-(2-carboxyethyl)-L-cys(ng/mL)  
**English Text:** N-acetyl-S-(2-carboxyethyl)-L-cysteine(ng/mL)  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
4.92 to 3670	Range of Values	2356	2356	
.	Missing	106	2462	

## URDCEMLC - N-acetyl-S-(2-carbxyethyl)-L-cys comt

**Variable Name:** URDCEMLC  
**SAS Label:** N-acetyl-S- (2-carbxyethyl)-L-cys comt  
**English Text:** N-acetyl-S- (2-carboxyethyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2349	2349	
1	Below lower detection limit	7	2356	
.	Missing	106	2462	

## URXCYHA - CYHA cysteine (ng/mL)

**Variable Name:** URXCYHA**SAS Label:** CYHA cysteine (ng/mL)**English Text:** N-Acetyl-S-(1-cyano-2-hydroxyethyl)-L-cysteine (CYHA) (ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1.84 to 510	Range of Values	2356	2356	
.	Missing	106	2462	

## URDCYALC - CYHA cysteine comment code

**Variable Name:** URDCYALC

**SAS Label:** CYHA cysteine comment code

**English Text:** N-Acetyl-S-(1-cyano-2-hydroxyethyl)-L-cysteine (CYHA) comment code

**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	857	857	
1	Below lower detection limit	1499	2356	
.	Missing	106	2462	

## URXCYM - N-acetyl-S-(2-cyanoethyl)-L-cyst(ng/mL)

**Variable Name:** URXCYM**SAS Label:** N-acetyl-S-(2-cyanoethyl)-L-cyst(ng/mL)**English Text:** N-acetyl-S-(2-cyanoethyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.354 to 2370	Range of Values	2356	2356	
.	Missing	106	2462	

## URDCYMLC - N-acetyl-S-(2-cyanoethyl)-L-cyst comt

**Variable Name:** URDCYMLC**SAS Label:** N-acetyl-S-(2-cyanoethyl)-L-cyst comt**English Text:** N-acetyl-S-(2-cyanoethyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2013	2013	
1	Below lower detection limit	343	2356	
.	Missing	106	2462	

## URXDHB - N-ace-S-(3,4-dihidxybutl)-L-cys(ng/mL)

**Variable Name:** URXDHB**SAS Label:** N-ace-S-(3,4-dihidxybutl)-L-cys(ng/mL)**English Text:** N-acetyl-S- (3,4-dihidroxybutyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
19.7 to 4330	Range of Values	2116	2116	
.	Missing	346	2462	



## URDDHBLC - N-ace-S-(3,4-dihidxybutl)-L-cys comt

**Variable Name:** URDDHBLC**SAS Label:** N-ace-S-(3,4-dihidxybutl)-L-cys comt**English Text:** N-acetyl-S- (3,4-dihidroxybutyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2116	2116	
1	Below lower detection limit	0	2116	
.	Missing	346	2462	

## URXDPM - N-ace-S-(dimethylphenyl)-L-cys(ng/mL)

**Variable Name:** URXDPM  
**SAS Label:** N-ace-S-(dimethylphenyl)-L-cys(ng/mL)  
**English Text:** N-acetyl-S-(dimethylphenyl)-L-cysteine(ng/mL)  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.354 to 6.38	Range of Values	2356	2356	
.	Missing	106	2462	

## URDDPMLC - N-ace-S-(dimethylphenyl)-L-cys comt

**Variable Name:** URDDPMLC**SAS Label:** N-ace-S-(dimethylphenyl)-L-cys comt**English Text:** N-acetyl-S-(dimethylphenyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	8	8	
1	Below lower detection limit	2348	2356	
.	Missing	106	2462	

## URXGAM - N-ac-S-(2-carbmo-2-hydxel)-L-cys(ng/mL)

**Variable Name:** URXGAM**SAS Label:** N-ac-S-(2-carbmo-2-hydxel)-L-cys(ng/mL)**English Text:** N-acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
6.65 to 169	Range of Values	2356	2356	
.	Missing	106	2462	

## URDGAMLC - N-ac-S-(2-carbmo-2-hydxel)-L-cys comt

**Variable Name:** URDGAMLC**SAS Label:** N-ac-S-(2-carbmo-2-hydxel)-L-cys comt**English Text:** N-acetyl-S-(2-carbamoyl-2-hydroxyethyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	1158	1158	
1	Below lower detection limit	1198	2356	
.	Missing	106	2462	

## URXHEM - N-ace-S-(2-hydroxyethyl)-L-cys(ng/mL)

**Variable Name:** URXHEM  
**SAS Label:** N-ace-S-(2-hydroxyethyl)-L-cys(ng/mL)  
**English Text:** N-acetyl-S-(2-hydroxyethyl)-L-cysteine(ng/mL)  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.559 to 81.9	Range of Values	2356	2356	
.	Missing	106	2462	

## URDHEMLC - N-ace-S-(2-hydroxyethyl)-L-cys comt

**Variable Name:** URDHEMLC**SAS Label:** N-ace-S-(2-hydroxyethyl)-L-cys comt**English Text:** N-acetyl-S-(2-hydroxyethyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	1339	1339	
1	Below lower detection limit	1017	2356	
.	Missing	106	2462	

## URXHP2 - N-ace-S-(2-hydroxypropyl)-L-cys(ng/mL)

**Variable Name:** URXHP2**SAS Label:** N-ace-S-(2-hydroxypropyl)-L-cys(ng/mL)**English Text:** N-acetyl-S- (2-hydroxypropyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
3.75 to 9830	Range of Values	2356	2356	
.	Missing	106	2462	



## URDHP2LC - N-ace-S-(2-hydroxypropyl)-L-cys comt

**Variable Name:** URDHP2LC  
**SAS Label:** N-ace-S-(2-hydroxypropyl)-L-cys comt  
**English Text:** N-acetyl-S- (2-hydroxypropyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2269	2269	
1	Below lower detection limit	87	2356	
.	Missing	106	2462	

## URXHPM - N-ace-S-(3-hydroxypropyl)-L-cys(ng/mL)

**Variable Name:** URXHPM**SAS Label:** N-ace-S-(3-hydroxypropyl)-L-cys(ng/mL)**English Text:** N-acetyl-S- (3-hydroxypropyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
9.2 to 12900	Range of Values	2211	2211	
.	Missing	251	2462	

## URDHPMLC - N-ace-S-(3-hydroxypropyl)-L-cys comt

**Variable Name:** URDHPMLC**SAS Label:** N-ace-S-(3-hydroxypropyl)-L-cys comt**English Text:** N-acetyl-S- (3-hydroxypropyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2209	2209	
1	Below lower detection limit	2	2211	
.	Missing	251	2462	

## URXIPM1 - IPM1 cysteine (ng/mL)

**Variable Name:** URXIPM1**SAS Label:** IPM1 cysteine (ng/mL)**English Text:** N-Acetyl-S-(2-hydroxy-3-methyl-3-butenyl)-L-cysteine + N-Acetyl-S-(2-hydroxy-2-methyl-3-butenyl)-L-cysteine (ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1.01 to 250	Range of Values	2356	2356	
.	Missing	106	2462	

## URDPM1LC - IPM1 cysteine comment code

**Variable Name:** URDPM1LC**SAS Label:** IPM1 cysteine comment code**English Text:** N-Acetyl-S-(2-hydroxy-3-methyl-3-butenyl)-L-cysteine + N-Acetyl-S-(2-hydroxy-2-methyl-3-butenyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2050	2050	
1	Below lower detection limit	306	2356	
.	Missing	106	2462	

## URXIPM3 - IPM3 cysteine (ng/mL)

**Variable Name:** URXIPM3**SAS Label:** IPM3 cysteine (ng/mL)**English Text:** N-Acetyl-S-(4-hydroxy-2-methyl-2-butenyl)-L-cysteine (ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.85 to 492	Range of Values	2356	2356	
.	Missing	106	2462	

## URDPM3LC - IPM3 cysteine comment code

**Variable Name:** URDPM3LC**SAS Label:** IPM3 cysteine comment code**English Text:** N-Acetyl-S-(4-hydroxy-2-methyl-2-butenyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2041	2041	
1	Below lower detection limit	315	2356	
.	Missing	106	2462	

## URXMAD - Mandelic acid(ng/mL)

**Variable Name:** URXMAD**SAS Label:** Mandelic acid(ng/mL)**English Text:** Mandelic acid(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
8.5 to 4390	Range of Values	2350	2350	
.	Missing	112	2462	



## URDMADLC - Mandelic acid comment code

**Variable Name:** URDMADLC  
**SAS Label:** Mandelic acid comment code  
**English Text:** Mandelic acid comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2334	2334	
1	Below lower detection limit	16	2350	
.	Missing	112	2462	

## URXMB1 - N-A-S-(1-hydrxmet)-2-Prpn)-L-cys(ng/mL)

**Variable Name:** URXMB1**SAS Label:** N-A-S-(1-hydrxmet)-2-Prpn)-L-cys(ng/mL)**English Text:** N-acetyl-S-(1-hydroxymethyl)-2-Propenyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.495 to 3.6	Range of Values	2340	2340	
.	Missing	122	2462	

## URDMB1LC - N-A-S-(1-hydrxmet)-2-Prpn)-L-cys comt

**Variable Name:** URDMB1LC**SAS Label:** N-A-S-(1-hydrxmet)-2-Prpn)-L-cys comt**English Text:** N-acetyl-S-(1-hydroxymethyl)-2-Propenyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	39	39	
1	Below lower detection limit	2301	2340	
.	Missing	122	2462	

## URXMB2 - N-Ac-S-(2-hydrxy-3-butenyl)-L-cys(ng/mL)

**Variable Name:** URXMB2**SAS Label:** N-Ac-S-(2-hydrxy-3-butenyl)-L-cys(ng/mL)**English Text:** N-acetyl-S- (2-hydroxy-3-butenyl)-L-cysteine (ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.495 to 94.9	Range of Values	2356	2356	
.	Missing	106	2462	

## URDMB2LC - N-Ac-S-(2-hydrxy-3-butenyl)-L-cys comt

**Variable Name:** URDMB2LC**SAS Label:** N-Ac-S-(2-hydrxy-3-butenyl)-L-cys comt**English Text:** N-acetyl-S-(2-hydroxy-3-butenyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	581	581	
1	Below lower detection limit	1775	2356	
.	Missing	106	2462	

## URXMB3 - N-A-S-(4-hydrxy-2-butenyl)-L-cys(ng/mL)

**Variable Name:** URXMB3**SAS Label:** N-A-S-(4-hydrxy-2-butenyl)-L-cys(ng/mL)**English Text:** N-acetyl-S- (4-hydroxy-2-butenyl)-L-cysteine (ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.424 to 407	Range of Values	2356	2356	
.	Missing	106	2462	

## URDMB3LC - N-A-S-(4-hydrxy-2-butenyl)-L-cys comt

**Variable Name:** URDMB3LC**SAS Label:** N-A-S-(4-hydrxy-2-butenyl)-L-cys comt**English Text:** N-acetyl-S- (4-hydroxy-2-butenyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2248	2248	
1	Below lower detection limit	108	2356	
.	Missing	106	2462	

## URXPHE - N-ace-S-(phenl-2-hydxyetl)-L-cys(ng/mL)

**Variable Name:** URXPHE**SAS Label:** N-ace-S-(phenl-2-hydxyetl)-L-cys(ng/mL)**English Text:** N-acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.495 to 107	Range of Values	2306	2306	
.	Missing	156	2462	



## URDPHELC - N-ace-S-(phenl-2-hydxyetl)-L-cys comt

**Variable Name:** URDPHELC**SAS Label:** N-ace-S-(phenl-2-hydxyetl)-L-cys comt**English Text:** N-acetyl-S-(phenyl-2-hydroxyethyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	1370	1370	
1	Below lower detection limit	936	2306	
.	Missing	156	2462	

## URXPHG - Phenylglyoxylic acid(ng/mL)

**Variable Name:** URXPHG**SAS Label:** Phenylglyoxylic acid(ng/mL)**English Text:** Phenylglyoxylic acid(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
8.5 to 5640	Range of Values	2353	2353	
.	Missing	109	2462	

## URDPHGLC - Phenylglyoxylic acid comment code

**Variable Name:** URDPHGLC  
**SAS Label:** Phenylglyoxylic acid comment code  
**English Text:** Phenylglyoxylic acid comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2341	2341	
1	Below lower detection limit	12	2353	
.	Missing	109	2462	

## URXPMA - N-acetyl-S-(phenyl)-L-cysteine(ng/mL)

**Variable Name:** URXPMA  
**SAS Label:** N-acetyl-S-(phenyl)-L-cysteine(ng/mL)  
**English Text:** N-acetyl-S-(phenyl)-L-cysteine(ng/mL)  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.424 to 28	Range of Values	2356	2356	
.	Missing	106	2462	

## URDPMALC - N-acetyl-S-(phenyl)-L-cysteine comt

**Variable Name:** URDPMALC  
**SAS Label:** N-acetyl-S-(phenyl)-L-cysteine comt  
**English Text:** N-acetyl-S-(phenyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	1158	1158	
1	Below lower detection limit	1198	2356	
.	Missing	106	2462	

## URXPMM - N-A-S-(3-hydrxprpl-1-metl)-L-cys(ng/mL)

**Variable Name:** URXPMM**SAS Label:** N-A-S-(3-hydrxprpl-1-metl)-L-cys(ng/mL)**English Text:** N-acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
18 to 30000	Range of Values	2356	2356	
.	Missing	106	2462	

## URDPMMLC - N-A-S-(3-hydrxprpl-1-metl)-L-cys comt

**Variable Name:** URDPMMLC**SAS Label:** N-A-S-(3-hydrxprpl-1-metl)-L-cys comt**English Text:** N-acetyl-S-(3-hydroxypropyl-1-methyl)-L-cysteine comment code**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	2356	2356	
1	Below lower detection limit	0	2356	
.	Missing	106	2462	

## URXTCV - N-acetyl-S-(trichlorovinyl)-L-cys(ng/mL)

**Variable Name:** URXTCV**SAS Label:** N-acetyl-S-(trichlorovinyl)-L-cys(ng/mL)**English Text:** N-acetyl-S-(trichlorovinyl)-L-cysteine(ng/mL)**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
2.12	2.12	2356	2356	
.	Missing	106	2462	



## URDTCVLC - N-acetyl-S-(trichlorovinyl)-L-cys comt

**Variable Name:** URDTCVLC  
**SAS Label:** N-acetyl-S-(trichlorovinyl)-L-cys comt  
**English Text:** N-acetyl-S-(trichlorovinyl)-L-cysteine comment code  
**Target:** Both males and females 18 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above the detection limit	0	0	
1	Below lower detection limit	2356	2356	
.	Missing	106	2462	