National Health and Nutrition Examination Survey

2017-March 2020 Data Documentation, Codebook, and Frequencies

Volatile Organic Compounds and Trihalomethanes/MTBE - Blood (P_VOCWB)

Data File: P_VOCWB.xpt

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Component Description

The NHANES program suspended field operations in March 2020 due to the coronavirus disease 2019 (COVID-19) pandemic. As a result, data collection for the NHANES 2019-2020 cycle was not completed and the collected data are not nationally representative. Therefore, data collected from 2019 to March 2020 were combined with data from the NHANES 2017-2018 cycle to form a nationally representative sample of NHANES 2017-March 2020 pre-pandemic data. These data are available to the public. Please refer to the Analytic Notes section for more details on the use of the data.

Volatile Organic Compounds and Trihalomethanes/MTBE (Whole Blood)

Volatile organic compounds (VOCs) are a large group of chemicals that have been used as solvents, degreasers, and cleaning agents in industry and consumer products. Many of the VOCs were found to contaminate ground water and drinking water sources. Because of human health concerns, these VOCs have been banned or restricted from most uses.

The halogenated solvents are VOCs consisting of a hydrocarbon chain or one hydrocarbon substituted with one or more chlorine or bromine atoms. Most of these chemicals are used as degreasers and solvents in various products, such as paint. In the past, 1,1,1-trichloroethane was used as a dry-cleaning agent, insect fumigant, and solvent in consumer products. Methylene chloride, tetrachloroethene, and trichloroethene are other VOCs that were widely used in the past.

Benzene, ethylbenzene, and xylene collectively referred to as BTEXS, are components of tobacco smoke. Along with 2,5-dimethylfuran, these VOCs are usually detected in the blood of cigarette smokers at higher levels than in non-smokers. Chlorobenzene (monochlorobenzene) and the three dichlorobenzenes are halogenated aromatic hydrocarbons primarily used in industrial and chemical synthetic processes. Chlorobenzene has been used to produce DDT, phenol, and nitrobenzene. The dichlorobenzenes are also chemical intermediates in the synthesis of dyes, pesticides, and other industrial products. 1,4-Dichlorobenzene (para-dichlorobenzene) is used also as a moth repellent and as a deodorizer. Disinfection by-products (DBP), including bromodichloromethane, dibromochloromethane, bromoform, and chloroform are formed when chlorine interacts with natural organic materials found in water. Primary sources of DBPs are chlorinated drinking water and recreational water bodies, such as swimming pools.

The prevalence of disinfection by-products in drinking water supplies has raised concerns about possible adverse health effects from chronic exposure to these potentially carcinogenic compounds. Methyl-tert-butyl ether (MTBE) was used as an additive to replace lead in gasoline, but its use was banned after widespread ground water contamination was discovered.

Inhalation is the most common VOC route of exposure in the general population, including indoor sources such as paints, adhesives, cleaning solutions, and aerosolized insecticide sprays; industries producing these solvents; and contaminated waste disposal sites. Drinking water may contribute to exposure when underground drinking water supplies are contaminated. After they are absorbed in the body, VOCs are rapidly eliminated in exhaled breath, or may be rapidly metabolized and eliminated in the urine.

Eligible Sample

Examined participants aged 12 years and older from a one-half sample in the NHANES 2017-March 2020 pre-pandemic sample were eligible.

Description of Laboratory Methodology

An automated analytical method was developed using capillary gas chromatography (GC) and mass spectrometry (MS) with selected-ion monitoring (SIM) detection and isotope-dilution. This method quantifies levels of individual VOCs and trihalomethanes (THMs) and methyl tert-butyl ether (MTBE) in whole blood to low-parts-per-trillion range. Because non-occupationally exposed individuals have blood VOC concentrations within this range, this method is applicable for determining these quantities and investigating cases of sustained or recent low-level exposure.

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

Laboratory Method Files

Volatile Organic Compounds (VOCs) & Trihalomethanes/MTBE Laboratory Procedure Manual (October 2020)

Volatile Organic Compounds (VOCs) & Trihalomethanes/MTBE Laboratory Procedure Manual (November 2021)

Laboratory Quality Assurance and Monitoring

Whole blood specimens were processed, stored, and shipped to 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 2017-2018 and 2019-2020 NHANES Laboratory Procedures Manuals (LPMs). Vials are stored under appropriate frozen (–30°C) conditions until they are shipped to National Center for Environmental Health for testing.

The NHANES quality assurance and quality control (QA/QC) protocols meet the 1988 Clinical Laboratory Improvement Act mandates. Detailed QA/QC instructions are discussed in the NHANES LPMs.

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

NCHS developed and distributed a QC protocol for all CDC and contract laboratories, which outlined the use of Westgard rules (Westgard, et al. 1981) 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 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’ QA/QC 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

The COVID-19 pandemic required suspension of NHANES 2019-2020 field operations in March 2020 after

data were collected in 18 of the 30 survey locations in the 2019-2020 sample. Data collection was cancelled for the remaining 12 locations. Because the collected data from 18 locations were not nationally representative, these data were combined with data from the previous cycle (2017-2018) to create a 2017-March 2020 pre-pandemic data file. A special weighting process was applied to the 2017-March 2020 pre-pandemic data file. The resulting sample weights in the demographic data file should be used to calculate estimates from the combined cycles. These sample weights are not appropriate for independent analyses of the 2019-2020 data and will not yield nationally representative results for either the 2017-2018 data alone or the 2019-March 2020 data alone. Please refer to the NHANES website for additional information for the NHANES 2017-March 2020 pre-pandemic data, and for the previous 2017-2018 public use data file with specific weights for that 2-year cycle.

Refer to the 2017-2018 and 2019-2020 Laboratory Data Overview documents for general information on NHANES laboratory data.

There are over 800 laboratory tests performed on NHANES participants. However, not all participants provided biospecimens or enough volume for all the tests to be performed. The specimen availability can also vary by age or other population characteristics. For example, in 2017-March 2020 approximately 76% of children aged 1-17 years who were examined in the MEC provided a blood specimen through phlebotomy, while 95% of examined adults age 18 and older provided a blood specimen. Analysts should evaluate the extent of missing data in the dataset related to the outcome of interest as well as any predictor variables used in the analyses to determine whether additional re-weighting for item non-response is necessary.

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.

Volatile Toxicant Questionnaire

A volatile toxicant questionnaire (VTQ) was administered on the mobile examination center (MEC), by trained interviewers, using the Computer-Assisted Personal Interview (CAPI) system. The VTQ section includes data about the participant's home, activities, amount of time spent in various locations, and exposure to different chemicals over the past 48 hours. This questionnaire data can be used in conjunction with the VOC laboratory dataset and found in the Volatile Toxicant Data File (P_VTQ) in the NHANES 2017-March 2020 Pre-Pandemic Questionnaire Data section.

Subsample Weights

Whole blood VOCs were measured in a one-half subsample of participants 12 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 the appropriate survey design and demographic variables. The NHANES 2017- March 2020 Pre-Pandemic 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.

The Fasting Questionnaire File includes auxiliary information, such as fasting status, length of fast and the time of venipuncture.

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 all of the analytes in the data set. Two variables are provided for each of these analytes. The variable name ending in "LC" (ex., LBD2DFLC) indicates whether the result was below the limit of detection: "0" means that the result was at or above the limit of detection, "1" indicates that the result was below the limit of detection. The other variable prefixed LBX (ex., LBX2DF) provides the analytic result for that analyte. All data are rounded to three significant figures or three decimal places, whichever is less precise. For analytes with analytic results below the lower limit of detection (ex., LBD2DFLC=1), an imputed fill value was placed in the analyte results field. This value is the lower limit of detection divided by square root of 2 (LLOD/sqrt [2]).

Lower Limit of Detection (LLOD, in ng/mL) for Whole Blood VOCs:

VARIABLE NAME	SAS LABEL	LLOD
LBX2DF	Blood 2,5-Dimethylfuran (ng/mL)	0.011
LBX4CE	Blood 1,1,1,2-Tetrachloroethane (ng/mL)	0.040
LBXV06	Blood Hexane (ng/mL)	0.122
LBXV07N	Blood Heptane (ng/mL)	0.100
LBXV08N	Blood Octane (ng/mL)	0.100
LBXV1D	Blood 1,2-Dichlorobenzene (ng/mL)	0.025
LBXV2A	Blood 1,2-Dichloroethane (ng/mL)	0.010
LBXV3B	Blood 1,3-Dichlorobenzene (ng/mL)	0.025
LBXV4C	Blood Tetrachloroethene (ng/mL)	0.048
LBXVAPN	Blood a-pinene (ng/mL)	0.020
LBXVBF	Blood Bromoform (ng/mL)	0.008
LBXVBM	Blood Bromodichloromethane (ng/mL)	0.006
LBXVBZ	Blood Benzene (ng/mL)	0.024
LBXVBZN	Blood Benzonitrile (ng/mL)	0.150
LBXVC6	Blood Cyclohexane (ng/mL)	0.020
LBXVCB	Blood Chlorobenzene (ng/mL)	0.011
LBXVCF	Blood Chloroform (ng/mL)	0.008
LBXVCM	Blood Dibromochloromethane (ng/mL)	0.005
LBXVCT	Blood Carbon Tetrachloride (ng/mL)	0.005
LBXVDB	Blood 1,4-Dichlorobenzene (ng/mL)	0.040
LBXVDE	Blood 1,2-Dibromoethane (ng/mL)	0.015
LBXVDEE	Blood Diethyl Ether (ng/mL)	0.040
LBXVEA	Blood Ethyl Acetate (ng/mL)	0.158
LBXVEB	Blood Ethylbenzene (ng/mL)	0.024
LBXVEC	Blood Chloroethane (ng/mL)	0.045
LBXVFN	Blood Furan (ng/mL)	0.025
LBXVIBN	Blood Isobutyronitrile (ng/mL)	0.040
LBXVIPB	Blood Isopropylbenzene (ng/mL)	0.040
LBXVMC	Blood Methylene Chloride (ng/mL)	0.250
LBXVMCP	Blood Methylcyclopentane (ng/mL)	0.020
LBXVME	Blood MTBE (ng/mL)	0.010
LBXVMIK	Blood Methyl Isobutyl Ketone (ng/mL)	0.100
LBXVNB	Blood Nitrobenzene (ng/mL)	0.320
LBXVOX	Blood o-Xylene (ng/mL)	0.024
LBXVTC	Blood Trichloroethene (ng/mL)	0.012
LBXVTE	Blood 1,1,1-Trichloroethane (ng/mL)	0.010
LBXVTFT	Blood aaa-Trifluorotoluene (ng/mL)	0.040
LBXVTHF	Blood Tetrahydrofuran (ng/mL)	0.125
LBXVTP	Blood 1,2,3-Trichloropropane (ng/mL)	0.040
LBXVVB	Blood Vinyl Bromide (ng/mL)	0.045

VARIABLE NAME	SAS LABEL	LLOD
LBXVXY	Blood m-/p-Xylene (ng/mL)	0.034

References

- Caudill SP, Schleicher RL, Pirkle JL. Multi-rule quality control for the age-related eye disease study. Statist 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

Variable Name:	SEQN
SAS Label:	Respondent sequence number
English Text:	Respondent sequence number.
Target:	Both males and females 12 YEARS - 150 YEARS

WTSVOCPR - VOC Subsample Weight Pre-Pandemic

Variable Name: WTSVOCPR

SAS Label: VOC Subsample Weight Pre-Pandemic

English Text: VOC Subsample Weight Pre-Pandemic

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
4958.19301 to 899918.46392	Range of Values	4598	4598	
0	No Lab Result	598	5196	
.	Missing	0	5196	

LBX2DF - Blood 2,5-Dimethylfuran (ng/mL)

Variable Name: LBX2DF

SAS Label: Blood 2,5-Dimethylfuran (ng/mL)

English Text: Blood 2,5-Dimethylfuran (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.008 to 1.14	Range of Values	4598	4598	
.	Missing	598	5196	

LBD2DFLC - Blood 2,5-Dimethylfuran Comment Code

Variable Name: LBD2DFLC

SAS Label: Blood 2,5-Dimethylfuran Comment Code

English Text: Blood 2,5-Dimethylfuran Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	765	765	
1	Below lower detection limit	3833	4598	
.	Missing	598	5196	

LBX4CE - Blood 1,1,1,2-Tetrachloroethane (ng/mL)

Variable Name: LBX4CE

SAS Label: Blood 1,1,1,2-Tetrachloroethane (ng/mL)

English Text: Blood 1,1,1,2-Tetrachloroethane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.028	0.028	4598	4598	
.	Missing	598	5196	

LBD4CELC - Blood 1,1,1,2-Tetrachloroethane Cmt Code

Variable Name: LBD4CELC

SAS Label: Blood 1,1,1,2-Tetrachloroethane Cmt Code

English Text: Blood 1,1,1,2-Tetrachloroethane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	0	0	
1	Below lower detection limit	4598	4598	
.	Missing	598	5196	

LBXV06 - Blood Hexane (ng/mL)

Variable Name: LBXV06

SAS Label: Blood Hexane (ng/mL)

English Text: Blood Hexane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.086 to 16.1	Range of Values	4428	4428	
.	Missing	768	5196	

LBDV06LC - Blood Hexane Comment Code

Variable Name: LBDV06LC

SAS Label: Blood Hexane Comment Code

English Text: Blood Hexane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	10	10	
1	Below lower detection limit	4418	4428	
.	Missing	768	5196	

LBXV07N - Blood Heptane (ng/mL)

Variable Name: LBXV07N

SAS Label: Blood Heptane (ng/mL)

English Text: Blood Heptane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.071 to 2.73	Range of Values	4578	4578	
.	Missing	618	5196	

LBDV07LC - Blood Heptane Comment Code

Variable Name: LBDV07LC

SAS Label: Blood Heptane Comment Code

English Text: Blood Heptane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	19	19	
1	Below lower detection limit	4559	4578	
.	Missing	618	5196	

LBXV08N - Blood Octane (ng/mL)

Variable Name: LBXV08N

SAS Label: Blood Octane (ng/mL)

English Text: Blood Octane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.071 to 47	Range of Values	4595	4595	
.	Missing	601	5196	

LBDV08LC - Blood Octane Comment Code

Variable Name: LBDV08LC

SAS Label: Blood Octane Comment Code

English Text: Blood Octane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	86	86	
1	Below lower detection limit	4509	4595	
.	Missing	601	5196	

LBXV1D - Blood 1,2-Dichlorobenzene (ng/mL)

Variable Name: LBXV1D

SAS Label: Blood 1,2-Dichlorobenzene (ng/mL)

English Text: Blood 1,2-Dichlorobenzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.018 to 0.046	Range of Values	4573	4573	
.	Missing	623	5196	

LBDV1DLC - Blood 1,2-Dichlorobenzene Comment Code

Variable Name: LBDV1DLC

SAS Label: Blood 1,2-Dichlorobenzene Comment Code

English Text: Blood 1,2-Dichlorobenzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	2	2	
1	Below lower detection limit	4571	4573	
.	Missing	623	5196	

LBXV2A - Blood 1,2-Dichloroethane (ng/mL)

Variable Name: LBXV2A

SAS Label: Blood 1,2-Dichloroethane (ng/mL)

English Text: Blood 1,2-Dichloroethane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.007 to 0.08	Range of Values	4576	4576	
.	Missing	620	5196	

LBDV2ALC - Blood 1,2-Dichloroethane Comment Code

Variable Name: LBDV2ALC

SAS Label: Blood 1,2-Dichloroethane Comment Code

English Text: Blood 1,2-Dichloroethane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	105	105	
1	Below lower detection limit	4471	4576	
.	Missing	620	5196	

LBXV3B - Blood 1,3-Dichlorobenzene (ng/mL)

Variable Name: LBXV3B

SAS Label: Blood 1,3-Dichlorobenzene (ng/mL)

English Text: Blood 1,3-Dichlorobenzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.018 to 0.018	Range of Values	4598	4598	
.	Missing	598	5196	

LBDV3BLC - Blood 1,3-Dichlorobenzene Comment Code

Variable Name: LBDV3BLC

SAS Label: Blood 1,3-Dichlorobenzene Comment Code

English Text: Blood 1,3-Dichlorobenzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	0	0	
1	Below lower detection limit	4598	4598	
.	Missing	598	5196	

LBXV4C - Blood Tetrachloroethene (ng/mL)

Variable Name: LBXV4C

SAS Label: Blood Tetrachloroethene (ng/mL)

English Text: Blood Tetrachloroethene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.034 to 16.3	Range of Values	4456	4456	
.	Missing	740	5196	

LBDV4CLC - Blood Tetrachloroethene Comment Code

Variable Name: LBDV4CLC

SAS Label: Blood Tetrachloroethene Comment Code

English Text: Blood Tetrachloroethene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	307	307	
1	Below lower detection limit	4149	4456	
.	Missing	740	5196	

LBXVBF - Blood Bromoform (ng/mL)

Variable Name: LBXVBF

SAS Label: Blood Bromoform (ng/mL)

English Text: Blood Bromoform (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.006 to 0.168	Range of Values	4562	4562	
.	Missing	634	5196	

LBDVBFLC - Blood Bromoform Comment Code

Variable Name: LBDVBFLC

SAS Label: Blood Bromoform Comment Code

English Text: Blood Bromoform Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	287	287	
1	Below lower detection limit	4275	4562	
.	Missing	634	5196	

LBXVBM - Blood Bromodichloromethane (ng/mL)

Variable Name: LBXVBM

SAS Label: Blood Bromodichloromethane (ng/mL)

English Text: Blood Bromodichloromethane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.004 to 0.05	Range of Values	4595	4595	
.	Missing	601	5196	

LBDVBMLC - Blood Bromodichloromethane Comment Code

Variable Name: LBDVBMLC

SAS Label: Blood Bromodichloromethane Comment Code

English Text: Blood Bromodichloromethane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	724	724	
1	Below lower detection limit	3871	4595	
.	Missing	601	5196	

LBXVBZ - Blood Benzene (ng/mL)

Variable Name: LBXVBZ

SAS Label: Blood Benzene (ng/mL)

English Text: Blood Benzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.017 to 5.3	Range of Values	4571	4571	
.	Missing	625	5196	

LBDVBZLC - Blood Benzene Comment Code

Variable Name: LBDVBZLC

SAS Label: Blood Benzene Comment Code

English Text: Blood Benzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	1711	1711	
1	Below lower detection limit	2860	4571	
.	Missing	625	5196	

LBXVBZN - Blood Benzonitrile (ng/mL)

Variable Name: LBXVBZN

SAS Label: Blood Benzonitrile (ng/mL)

English Text: Blood Benzonitrile (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.106 to 1.93	Range of Values	4598	4598	
.	Missing	598	5196	

LBDVZBLC - Blood Benzonitrile Comment Code

Variable Name: LBDVZBLC

SAS Label: Blood Benzonitrile Comment Code

English Text: Blood Benzonitrile Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	304	304	
1	Below lower detection limit	4294	4598	
.	Missing	598	5196	

LBXVC6 - Blood Cyclohexane (ng/mL)

Variable Name: LBXVC6

SAS Label: Blood Cyclohexane (ng/mL)

English Text: Blood Cyclohexane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.014 to 12	Range of Values	4569	4569	
.	Missing	627	5196	

LBDVC6LC - Blood Cyclohexane Comment Code

Variable Name: LBDVC6LC

SAS Label: Blood Cyclohexane Comment Code

English Text: Blood Cyclohexane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	46	46	
1	Below lower detection limit	4523	4569	
.	Missing	627	5196	

LBXVCB - Blood Chlorobenzene (ng/mL)

Variable Name: LBXVCB

SAS Label: Blood Chlorobenzene (ng/mL)

English Text: Blood Chlorobenzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.008 to 0.032	Range of Values	4598	4598	
.	Missing	598	5196	

LBDVCBLC - Blood Chlorobenzene Comment Code

Variable Name: LBDVCBLC

SAS Label: Blood Chlorobenzene Comment Code

English Text: Blood Chlorobenzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	6	6	
1	Below lower detection limit	4592	4598	
.	Missing	598	5196	

LBXVCF - Blood Chloroform (ng/mL)

Variable Name: LBXVCF

SAS Label: Blood Chloroform (ng/mL)

English Text: Blood Chloroform (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.006 to 0.602	Range of Values	4589	4589	
.	Missing	607	5196	

LBDVCFLC - Blood Chloroform Comment Code

Variable Name: LBDVCFLC

SAS Label: Blood Chloroform Comment Code

English Text: Blood Chloroform Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	2468	2468	
1	Below lower detection limit	2121	4589	
.	Missing	607	5196	

LBXVCM - Blood Dibromochloromethane (ng/mL)

Variable Name: LBXVCM

SAS Label: Blood Dibromochloromethane (ng/mL)

English Text: Blood Dibromochloromethane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.004 to 0.054	Range of Values	4597	4597	
.	Missing	599	5196	

LBDVCMLC - Blood Dibromochloromethane Comment Code

Variable Name: LBDVCMLC

SAS Label: Blood Dibromochloromethane Comment Code

English Text: Blood Dibromochloromethane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	484	484	
1	Below lower detection limit	4113	4597	
.	Missing	599	5196	

LBXVCT - Blood Carbon Tetrachloride (ng/mL)

Variable Name: LBXVCT

SAS Label: Blood Carbon Tetrachloride (ng/mL)

English Text: Blood Carbon Tetrachloride (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.004 to 0.016	Range of Values	4574	4574	
.	Missing	622	5196	

LBDVCTLC - Blood Carbon Tetrachloride Comment Code

Variable Name: LBDVCTLC

SAS Label: Blood Carbon Tetrachloride Comment Code

English Text: Blood Carbon Tetrachloride Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	7	7	
1	Below lower detection limit	4567	4574	
.	Missing	622	5196	

LBXVDB - Blood 1,4-Dichlorobenzene (ng/mL)

Variable Name: LBXVDB

SAS Label: Blood 1,4-Dichlorobenzene (ng/mL)

English Text: Blood 1,4-Dichlorobenzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.028 to 236	Range of Values	4579	4579	
.	Missing	617	5196	

LBDVDBLC - Blood 1,4-Dichlorobenzene Comment Code

Variable Name: LBDVDBLC

SAS Label: Blood 1,4-Dichlorobenzene Comment Code

English Text: Blood 1,4-Dichlorobenzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	1979	1979	
1	Below lower detection limit	2600	4579	
.	Missing	617	5196	

LBXVDE - Blood 1,2-Dibromoethane (ng/mL)

Variable Name: LBXVDE

SAS Label: Blood 1,2-Dibromoethane (ng/mL)

English Text: Blood 1,2-Dibromoethane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.011	0.011	4598	4598	
.	Missing	598	5196	

LBDVDELC - Blood 1,2-Dibromoethane Comment Code

Variable Name: LBDVDELC

SAS Label: Blood 1,2-Dibromoethane Comment Code

English Text: Blood 1,2-Dibromoethane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	0	0	
1	Below lower detection limit	4598	4598	
.	Missing	598	5196	

LBXVDEE - Blood Diethyl Ether (ng/mL)

Variable Name: LBXVDEE

SAS Label: Blood Diethyl Ether (ng/mL)

English Text: Blood Diethyl Ether (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.028 to 0.08	Range of Values	4457	4457	
.	Missing	739	5196	

LBDVEELC - Blood Diethyl Ether Comment Code

Variable Name: LBDVEELC

SAS Label: Blood Diethyl Ether Comment Code

English Text: Blood Diethyl Ether Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	3	3	
1	Below lower detection limit	4454	4457	
.	Missing	739	5196	

LBXVEA - Blood Ethyl Acetate (ng/mL)

Variable Name: LBXVEA

SAS Label: Blood Ethyl Acetate (ng/mL)

English Text: Blood Ethyl Acetate (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.112 to 114	Range of Values	4548	4548	
.	Missing	648	5196	

LBDVEALC - Blood Ethyl Acetate Comment Code

Variable Name: LBDVEALC

SAS Label: Blood Ethyl Acetate Comment Code

English Text: Blood Ethyl Acetate Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	79	79	
1	Below lower detection limit	4469	4548	
.	Missing	648	5196	

LBXVEB - Blood Ethylbenzene (ng/mL)

Variable Name: LBXVEB

SAS Label: Blood Ethylbenzene (ng/mL)

English Text: Blood Ethylbenzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.017 to 134	Range of Values	4598	4598	
.	Missing	598	5196	

LBDVEBLC - Blood Ethylbenzene Comment Code

Variable Name: LBDVEBLC

SAS Label: Blood Ethylbenzene Comment Code

English Text: Blood Ethylbenzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	1279	1279	
1	Below lower detection limit	3319	4598	
.	Missing	598	5196	

LBXVEC - Blood Chloroethane (ng/mL)

Variable Name: LBXVEC

SAS Label: Blood Chloroethane (ng/mL)

English Text: Blood Chloroethane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.032 to 0.617	Range of Values	4463	4463	
.	Missing	733	5196	

LBDVECLC - Blood Chloroethane Comment Code

Variable Name: LBDVECLC

SAS Label: Blood Chloroethane Comment Code

English Text: Blood Chloroethane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	3	3	
1	Below lower detection limit	4460	4463	
.	Missing	733	5196	

LBXVFN - Blood Furan (ng/mL)

Variable Name: LBXVFN

SAS Label: Blood Furan (ng/mL)

English Text: Blood Furan (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.018 to 0.412	Range of Values	4572	4572	
.	Missing	624	5196	

LBDVFNLC - Blood Furan Comment Code

Variable Name: LBDVFNLC

SAS Label: Blood Furan Comment Code

English Text: Blood Furan Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	717	717	
1	Below lower detection limit	3855	4572	
.	Missing	624	5196	

LBXVIBN - Blood Isobutyronitrile (ng/mL)

Variable Name: LBXVIBN

SAS Label: Blood Isobutyronitrile (ng/mL)

English Text: Blood Isobutyronitrile (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.028 to 1.62	Range of Values	4539	4539	
.	Missing	657	5196	

LBDVIBLC - Blood Isobutyronitrile Comment Code

Variable Name: LBDVIBLC

SAS Label: Blood Isobutyronitrile Comment Code

English Text: Blood Isobutyronitrile Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	347	347	
1	Below lower detection limit	4192	4539	
.	Missing	657	5196	

LBXVIPB - Blood Isopropylbenzene (ng/mL)

Variable Name: LBXVIPB

SAS Label: Blood Isopropylbenzene (ng/mL)

English Text: Blood Isopropylbenzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.028 to 0.578	Range of Values	4532	4532	
.	Missing	664	5196	

LBDVIPLC - Blood Isopropylbenzene Comment Code

Variable Name: LBDVIPLC

SAS Label: Blood Isopropylbenzene Comment Code

English Text: Blood Isopropylbenzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	11	11	
1	Below lower detection limit	4521	4532	
.	Missing	664	5196	

LBXVMC - Blood Methylene Chloride (ng/mL)

Variable Name: LBXVMC

SAS Label: Blood Methylene Chloride (ng/mL)

English Text: Blood Methylene Chloride (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.177 to 1.54	Range of Values	4570	4570	
.	Missing	626	5196	

LBDVMCLC - Blood Methylene Chloride Comment Code

Variable Name: LBDVMCLC

SAS Label: Blood Methylene Chloride Comment Code

English Text: Blood Methylene Chloride Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	9	9	
1	Below lower detection limit	4561	4570	
.	Missing	626	5196	

LBXVMCP - Blood Methylcyclopentane (ng/mL)

Variable Name: LBXVMCP

SAS Label: Blood Methylcyclopentane (ng/mL)

English Text: Blood Methylcyclopentane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.014 to 62.5	Range of Values	4520	4520	
.	Missing	676	5196	

LBDVMPLC - Blood Methylcyclopentane Comment Code

Variable Name: LBDVMPLC

SAS Label: Blood Methylcyclopentane Comment Code

English Text: Blood Methylcyclopentane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	87	87	
1	Below lower detection limit	4433	4520	
.	Missing	676	5196	

LBXVME - Blood MTBE (ng/mL)

Variable Name: LBXVME

SAS Label: Blood MTBE (ng/mL)

English Text: Blood Methyl-tert-butyl ether (MTBE) (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.007 to 0.324	Range of Values	4499	4499	
.	Missing	697	5196	

LBDVMELC - Blood MTBE Comment Code

Variable Name: LBDVMELC

SAS Label: Blood MTBE Comment Code

English Text: Blood Methyl-tert-butyl ether (MTBE) Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	38	38	
1	Below lower detection limit	4461	4499	
.	Missing	697	5196	

LBXVMIK - Blood Methyl Isobutyl Ketone (ng/mL)

Variable Name: LBXVMIK

SAS Label: Blood Methyl Isobutyl Ketone (ng/mL)

English Text: Blood Methyl Isobutyl Ketone (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.071 to 0.233	Range of Values	4594	4594	
.	Missing	602	5196	

LBDVMKLC - Blood Methyl Isobutyl Ketone Comt Code

Variable Name: LBDVMKLC

SAS Label: Blood Methyl Isobutyl Ketone Comt Code

English Text: Blood Methyl Isobutyl Ketone Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	31	31	
1	Below lower detection limit	4563	4594	
.	Missing	602	5196	

LBXVNB - Blood Nitrobenzene (ng/mL)

Variable Name: LBXVNB

SAS Label: Blood Nitrobenzene (ng/mL)

English Text: Blood Nitrobenzene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.226 to 0.226	Range of Values	4578	4578	
.	Missing	618	5196	

LBDVNBLC - Blood Nitrobenzene Comment Code

Variable Name: LBDVNBLC

SAS Label: Blood Nitrobenzene Comment Code

English Text: Blood Nitrobenzene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	0	0	
1	Below lower detection limit	4578	4578	
.	Missing	618	5196	

LBXVOX - Blood o-Xylene (ng/mL)

Variable Name: LBXVOX

SAS Label: Blood o-Xylene (ng/mL)

English Text: Blood o-Xylene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.017 to 119	Range of Values	4598	4598	
.	Missing	598	5196	

LBDVOXLC - Blood o-Xylene Comment Code

Variable Name: LBDVOXLC

SAS Label: Blood o-Xylene Comment Code

English Text: Blood o-Xylene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	1201	1201	
1	Below lower detection limit	3397	4598	
.	Missing	598	5196	

LBXVTC - Blood Trichloroethene (ng/mL)

Variable Name: LBXVTC

SAS Label: Blood Trichloroethene (ng/mL)

English Text: Blood Trichloroethene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.008 to 0.142	Range of Values	4571	4571	
.	Missing	625	5196	

LBDVTCLC - Blood Trichloroethene Comment Code

Variable Name: LBDVTCLC

SAS Label: Blood Trichloroethene Comment Code

English Text: Blood Trichloroethene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	37	37	
1	Below lower detection limit	4534	4571	
.	Missing	625	5196	

LBXVTE - Blood 1,1,1-Trichloroethane (ng/mL)

Variable Name: LBXVTE

SAS Label: Blood 1,1,1-Trichloroethane (ng/mL)

English Text: Blood 1,1,1-Trichloroethane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.007 to 2.89	Range of Values	4531	4531	
.	Missing	665	5196	

LBDVTELC - Blood 1,1,1-Trichloroethane Comment Code

Variable Name: LBDVTELC

SAS Label: Blood 1,1,1-Trichloroethane Comment Code

English Text: Blood 1,1,1-Trichloroethane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	29	29	
1	Below lower detection limit	4502	4531	
.	Missing	665	5196	

LBXVTFT - Blood aaa-Trifluorotoluene (ng/mL)

Variable Name: LBXVTFT

SAS Label: Blood aaa-Trifluorotoluene (ng/mL)

English Text: Blood aaa-Trifluorotoluene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.028 to 0.028	Range of Values	4598	4598	
.	Missing	598	5196	

LBDVFTLC - Blood aaa-Trifluorotoluene Comment Code

Variable Name: LBDVFTLC

SAS Label: Blood aaa-Trifluorotoluene Comment Code

English Text: Blood aaa-Trifluorotoluene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	0	0	
1	Below lower detection limit	4598	4598	
.	Missing	598	5196	

LBXVTHF - Blood Tetrahydrofuran (ng/mL)

Variable Name: LBXVTHF

SAS Label: Blood Tetrahydrofuran (ng/mL)

English Text: Blood Tetrahydrofuran (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.088 to 2.69	Range of Values	4547	4547	
.	Missing	649	5196	

LBDVHTLC - Blood Tetrahydrofuran Comment Code

Variable Name: LBDVHTLC

SAS Label: Blood Tetrahydrofuran Comment Code

English Text: Blood Tetrahydrofuran Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	17	17	
1	Below lower detection limit	4530	4547	
.	Missing	649	5196	

LBXVTP - Blood 1,2,3-Trichloropropane (ng/mL)

Variable Name: LBXVTP

SAS Label: Blood 1,2,3-Trichloropropane (ng/mL)

English Text: Blood 1,2,3-Trichloropropane (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.028 to 0.028	Range of Values	4576	4576	
.	Missing	620	5196	

LBDVTPLC - Blood 1,2,3-Trichloropropane Comt Code

Variable Name: LBDVTPLC

SAS Label: Blood 1,2,3-Trichloropropane Comt Code

English Text: Blood 1,2,3-Trichloropropane Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	0	0	
1	Below lower detection limit	4576	4576	
.	Missing	620	5196	

LBXVVB - Blood Vinyl Bromide (ng/mL)

Variable Name: LBXVVB

SAS Label: Blood Vinyl Bromide (ng/mL)

English Text: Blood Vinyl Bromide (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.032 to 0.032	Range of Values	4577	4577	
.	Missing	619	5196	

LBDVVBLC - Blood Vinyl Bromide Comment Code

Variable Name: LBDVVBLC

SAS Label: Blood Vinyl Bromide Comment Code

English Text: Blood Vinyl Bromide Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	0	0	
1	Below lower detection limit	4577	4577	
.	Missing	619	5196	

LBXVXY - Blood m-/p-Xylene (ng/mL)

Variable Name: LBXVXY

SAS Label: Blood m-/p-Xylene (ng/mL)

English Text: Blood m-/p-Xylene (ng/mL)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.024 to 649	Range of Values	4582	4582	
.	Missing	614	5196	

LBDVXYLC - Blood m-/p-Xylene Comment Code

Variable Name: LBDVXYLC

SAS Label: Blood m-/p-Xylene Comment Code

English Text: Blood m-/p-Xylene Comment Code

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0	At or above detection limit	2936	2936	
1	Below lower detection limit	1646	4582	
.	Missing	614	5196	