National Health and Nutrition Examination Survey

2015-2016 Data Documentation, Codebook, and Frequencies

do not use this

Urine Flow Rate (UCFLOW_I)

Data File: UCFLOW_I.xpt

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Last Revised: NA

Component Description

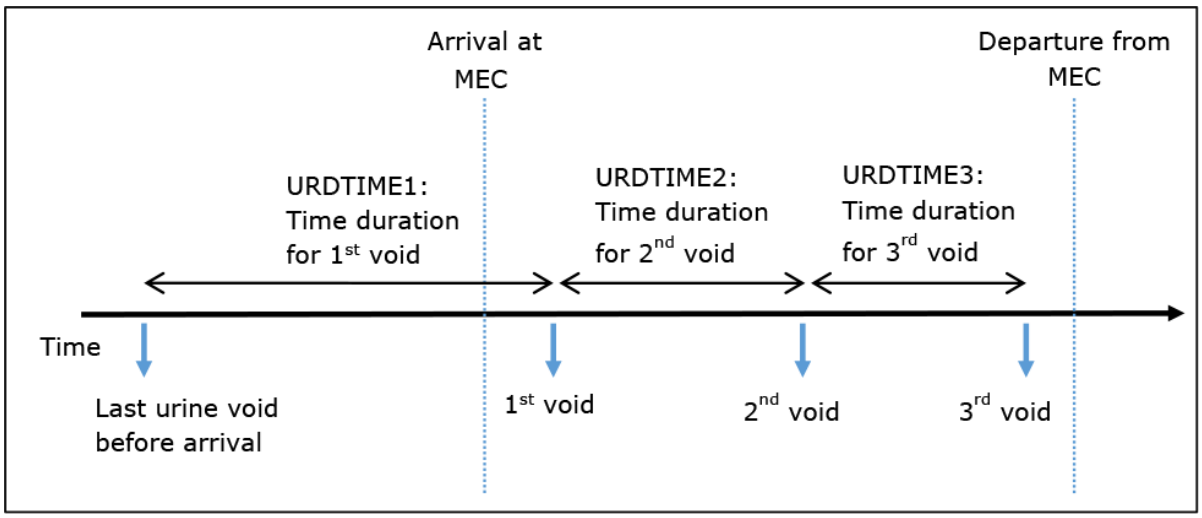
The Urine Flow Rate (or urine excretion rate) is a measurement of the quantity of urine produced in a specified period of time. Urine analyte concentrations from single determinations (spot urines) can vary depending on level of hydration. Due to this variation, the urine flow rate, when used in conjunction with analyte concentration measured on spot urine, can produce a better measure of analyte excretion rate, especially in the context of exposure to environmental chemicals. The urine excretion rate (mg/min) is the product of the urine flow rate (mL/min) and the urine analyte concentration (mg/mL).

Eligible Sample

All examined participants aged 3 years and older were eligible.

Description of Laboratory Methodology

Participants will be asked to record the time of their last void before coming to the mobile examination centers (MEC). Participants will then be asked to void at the MEC where the time of collection and volume of the urine will be recorded. The volume of the urine sample collected at the MEC will be measured and the urine flow rate will be calculated from this information. Up to three voids were collected for the purpose of ensuring sufficient total volume for various analyses, with volumes and timing recorded. Collected samples were composited then aliquoted into separate vessels such that all analyses can be conducted on the composite sample. The figure below depict the scheme for collecting urine samples and recording time duration covered for each urine void.



The urine flow rate is calculated by dividing the volume of the urine sample collected by the time duration between the previous urine void and the urine sample collection in the MEC. There may be a maximum of 3 urine flow rates associated with each urine void for a participant, but that depends on the total number of spot urines collected in the MEC.

Since all urinary analyte concentrations are measured in the composite sample, the urinary flow rate associated with a given urinary analyte concentration is calculated using the total volume of urine collected and total time duration covered by all urine voids. How to perform this calculation is described below under “Analytic Note.”

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

Laboratory Quality Assurance and Monitoring

Random/spot urine samples are processed and weighed in the MEC.

Detailed instructions on specimen collection and processing are discussed in the NHANES Laboratory Procedures Manual (LPM).

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 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.

Data Processing and Editing

The data were reviewed. Incomplete data or improbable values were identified and corrected.

Analytic Notes

Refer to the 2015-2016 Laboratory Data Overview for general information on NHANES laboratory data.

Conceptually, urinary flow rate for the composite urine sample is calculated as: Urinary flow rate = (total urine volume)/(total time duration)

The exact form of formula is different depending on how many urine spot urine samples are collected at the MEC. In general, the calculation should involve only the information on the first urine collection through the last urine collection with non-zero, non-missing volume and non-missing time duration. Three forms of formulae are described with specification of when to use.

1) Formula involving the volume and time information from the first urine collection.

Many survey participants provided sufficient volume of urine at the first collection, and there was no 2nd or 3rd urine collection. For those, urinary flowrate associated with urinary analyte concentrations is calculated as:

Urinary flowrate = URXVOL1/ URXTIME1 = URDFLOW1

This formula also is used for survey participants who: has the volume of second urine collection recorded as zero and the volume of third urine collection recorded as missing; or has the volumes of second and third urine collection recorded as zero.

2) Formula involving the volume and time information from first and second urine collections.

For survey participants who provided two spot urine samples, urinary flowrate associated with urinary analyte concentrations is calculated as:

Urinary flowrate = (URXVOL1 + URXVOL2) / (URXTIME1 + URXTIME2)

This formula also is used for survey participants who has the volume of first urine collection recorded as zero and the volume of second urine collection recorded as > zero with missing volume of the third urine collection (i.e., no or very little urine was collected for the first attempt to collect a urine sample and there was no third urine sample).

3) Formula involving the volume and time information from the first, second, and third urine collections.

For survey participants who provided three spot urine samples, urinary flowrate associated with urinary analyte concentrations is calculated as:

Urinary flow rate= (URXVOL1 + URXVOL2 + URXVOL3)/(URXTIME1 + URXTIME2 + URXTIME3)

Please note that this formula also should be used when URXVOL1 and/or URXVOL2 is zero and URXVOL3 > 0 (i.e., no or very little urine was collected for the first and/or second urine attempt to collect urine samples).

Please note that the time of last urine void before arriving the MEC was based on self-reported information from the participant, therefore, the data may be subject to reporting error. Analysts should examine the data distribution and use their subject-matter knowledge to decide whether to include, trim, or exclude any potential outliers in their analyses.

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 weight 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

Since this data is calculated the use of lower limits of detection (LLODs) isn't applicable.

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.

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 3 YEARS - 150 YEARS

URXVOL1 - The volume of urine collection #1 (mL)

Variable Name: URXVOL1

SAS Label: The volume of urine collection #1 (mL)

English Text: The volume of urine collection #1 (mL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0 to 525	Range of Values	8291	8291	
.	Missing	317	8608	

URDFLOW1 - Urine #1 Flow Rate (mL/min)

Variable Name: URDFLOW1

SAS Label: Urine #1 Flow Rate (mL/min)

English Text: Urine #1 Flow Rate (mL/min)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0 to 11.81	Range of Values	6835	6835	
.	Missing	1773	8608	

URDTIME1 - Minutes b/w last urination & urine # 1

Variable Name: URDTIME1

SAS Label: Minutes b/w last urination & urine # 1

English Text: The time between URXLTUR and URXUCDT1 (derived: (uraucdt1-urxltur)/60)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
11 to 1606	Range of Values	6835	6835	
.	Missing	1773	8608	

URXVOL2 - The volume of urine collection #2 (mL)

Variable Name: URXVOL2

SAS Label: The volume of urine collection #2 (mL)

English Text: The volume of urine collection #2 (mL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0 to 452	Range of Values	1464	1464	
.	Missing	7144	8608	

URDFLOW2 - Urine #2 Flow Rate (mL/min)

Variable Name: URDFLOW2

SAS Label: Urine #2 Flow Rate (mL/min)

English Text: Urine #2 Flow Rate (mL/min)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0 to 76	Range of Values	1464	1464	
.	Missing	7144	8608	

URDTIME2 - Minutes b/w urine # 1 & urine # 2

Variable Name: URDTIME2

SAS Label: Minutes b/w urine # 1 & urine # 2

English Text: The time between URXUCDT1 and URXUCDT2 (derived: (uraucdt2-uraucdt1)/60)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1 to 253	Range of Values	1464	1464	
.	Missing	7144	8608	

URXVOL3 - The volume of urine collection #3 (mL)

Variable Name: URXVOL3

SAS Label: The volume of urine collection #3 (mL)

English Text: The volume of urine collection #3 (mL)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0 to 410	Range of Values	46	46	
.	Missing	8562	8608	

URDFLOW3 - Urine #3 Flow Rate (mL/min)

Variable Name: URDFLOW3

SAS Label: Urine #3 Flow Rate (mL/min)

English Text: Urine #3 Flow Rate (mL/min)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0 to 6.905	Range of Values	46	46	
.	Missing	8562	8608	

URDTIME3 - Minutes b/w urine # 2 & urine # 3

Variable Name: URDTIME3

SAS Label: Minutes b/w urine # 2 & urine # 3

English Text: The time between URXUCDT2 and URXUCDT13 (derived: (uraucdt3-uraucdt2)/60)

Target: Both males and females 3 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
13 to 150	Range of Values	46	46	
.	Missing	8562	8608	