National Health and Nutrition Examination Survey

2017-March 2020 Data Documentation, Codebook, and Frequencies

Body Measures (P_BMX)

Data File: P_BMX.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.

NHANES body measures data are used to monitor trends in infant and child growth, to estimate the prevalence of overweight and obesity in U.S. children, adolescents, and adults, and to examine the associations between body weight and the health and nutritional status of the U.S. population.

The measurements and target age groups for the NHANES 2017-March 2020 pre-pandemic body measures data file (P_BMX) are as follows:

- Weight: All ages
- Head circumference: birth through 6 months of age
- Recumbent length: birth through 47 months of age
- Standing height: 2 years and older
- Upper leg length: 8 years and older
- Upper arm length: 2 months of age and older
- Mid-upper arm circumference: 2 months of age and older
- Waist circumference: 2 years of age and older
- Hip circumference: 12 years of age and older

Eligible Sample

All examined survey participants in the NHANES 2017-March 2020 pre-pandemic sample are included in this dataset. There were no medical, safety, or other exclusions for the body measures protocol. The health technicians used their discretion to obtain as many measures as practical for persons who used a wheelchair.

Protocol and Procedure

The body measures data were collected, in the Mobile Examination Center (MEC), by trained health technicians. The health technician was assisted by a recorder during the body measures examination. The participant's age at the time of the screening interview determined the body measures examination protocol. In some instances, the age at the screening interview and age

at the time of the health examination differed by several weeks. The Demographics data file includes variables age in years at screening (RIDAGEYR) for all participants and age in months at screening (RIDAGEMN) for participants 0 to 24 months. Data on age at examination are available through the Research Data Center (RDC).

Arm and leg measurements were made on the right side of the body. If a participant had an amputation, medical condition, or medical appliance, such as a cast, that prevented measurements from being taken on the right side of the body, the health technician took measurements on the left side. The body measures file does not identify participants who had amputations because that information may be considered identifiable and pose a disclosure concern. The body weight data for participants who had limb amputations were set to "missing."

This data file includes body measures for women who were pregnant at the time of their health examination. Pregnancy status at the time of the health examination is indicated by the variable, RIDEXPRG, in the Demographic data file. RIDEXPRG values are reported for women 20–44 years of age. RIDEXPRG for several pregnant women who were outside of this age range are not reported due to disclosure concerns. The body measures data for these participants are also not reported. The NHANES 2017-2018 and 2019-2020 Anthropometry Procedures Manual are available on the NHANES website.

Quality Assurance & Quality Control

The NHANES health technicians completed a 2-day training program with survey staff and an expert anthropometrist. The training included an overview of the component, general guidelines and technical skills for each measurement, and demonstrations conducted by the expert examiner with volunteer subjects. The expert examiner reviewed and demonstrated the proper technique to use for each measure. Supervised practice exercises followed, conducted with several volunteer subjects, including infants, children, and adults. The chief health technician, at each of the MECs, monitored staff performance in the field. Health technician performance was also monitored using direct observation, data reviews, and periodic expert examiner (gold standard comparison) evaluations.

The body measures examination rooms in each of the MECs were identical with respect to layout and equipment. Scheduled equipment calibration was performed by the health technicians and verified by supervisory staff. The Anthropometry Procedures Manual includes detailed descriptions of the quality assurance and quality control measures that are used in the NHANES anthropometry/body measures component.

Data Processing and Editing

The P_BMX data were reviewed for unusual and erroneous values. Review criteria were based on the NHANES 1999–2016 body measurement data. During the data review, values that were above the 99th percentile or below the 1st percentile, for a specific age or age-gender group, were flagged for review. When records were flagged, the entire body measures record was reviewed for reasonableness. Subject characteristics, such as height, weight, age, and gender were taken into consideration. Values that were determined to be unrealistic were deleted from the file. None of the original body measures data were changed and there are no imputed values in this file.

Component status code (BMXSTATS):
This variable was created to indicate body measures component status. There are four categories:

1. Complete data for age group
2. Partial: only height and weight obtained
3. Other partial exam
4. No body measures exam data

Body Mass Index (BMXBMI):
Body Mass Index (BMI) was calculated as weight in kilograms divided by height in meters squared, and then rounded to one decimal place.

BMI Category – Children/Adolescents (BMDBMIC): This variable was created for children and adolescents aged 2 to 19 years at examination. Cutoff criteria are based on the Centers for Disease Control (CDC) growth chart "BMI-for-age charts, 2 to 20 years, by sex and age". Age in months at examination was used to match age in months from BMI growth chart data, separately for males and females. There are four categories:

1. Underweight (BMI < 5th percentile)
2. Normal weight (BMI 5th to < 85th percentiles)
3. Overweight (BMI 85th to < 95th percentiles)
4. Obese (BMI ≥ 95th percentile)

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. 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. The resulting sample weights in the demographic file should be used to calculate estimates from the combined cycles. The sample weights are not appropriate to 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.

Component status code: A final body measures component status code provides analysis with a quick method of identifying survey participants with complete or partial body measure measurement data.

Unusual values: Unusual body measures values were noted during the review of the data. Typically, unusual values occurred when a subject was extremely short, tall, overweight, or underweight. In addition, the upper arm length (BMXARML) and upper leg length (BMXLEG) values may be affected by extreme amounts of adipose tissue. Analysts should examine the distributions of the body measurements carefully and consider whether it is appropriate to include or exclude extreme values in each analysis.

Comment codes: Comment codes were added by the health technicians, during data collection, to document problems or situations that arose during the body measures examination. For example, the variable BMIWT is a comment code for the body weight measurement. If a participant did not change into the NHANES exam gown, a code of BMIWT of "3" denoting "clothing worn" was made in the record. Analysts should review the comment code information for each of the body measures prior to data analysis.

Weight status classification: BMI, expressed as weight in kilograms divided by height in meters squared (Kg/m2), is commonly used to classify weight status. The definitions of underweight, normal weight, overweight, and obesity in children and adolescents are not directly comparable with the definitions in adults. The age-and sex-specific 5th, 85th, and 95th percentiles of the growth charts are usually used as cutoff criteria for children and adolescents. The variable BMDBMIC provides weight status categorical for children and adolescents aged 2 to 19 years at examination. Consequently, BMDBMIC was not calculated for a few participants who were 19 years at the screening interview but became 20 years at the health examination. Information about age in years at screening for all participants is available in the Demographic data file. Data on age at examination are available through the NCHS RDC.

Sample weights: The NHANES examination sample weights should be used to analyze the body measures data. Please refer to the NHANES Analytic Guidelines and the online 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 0 YEARS - 150 YEARS

BMDSTATS - Body Measures Component Status Code

Variable Name: BMDSTATS

SAS Label: Body Measures Component Status Code

English Text: Body Measures Component status Code

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Complete data for age group	13220	13220	
2	Partial: Only height and weight obtained	424	13644	
3	Other partial exam	463	14107	
4	No body measures exam data	193	14300	
.	Missing	0	14300	

BMXWT - Weight (kg)

Variable Name: BMXWT

SAS Label: Weight (kg)

English Text: Weight (kg)

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
3.2 to 254.3	Range of Values	14075	14075	
.	Missing	225	14300	

BMIWT - Weight Comment

Variable Name: BMIWT

SAS Label: Weight Comment

English Text: Weight Comment

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	23	23	
3	Clothing	523	546	
4	Medical appliance	42	588	
.	Missing	13712	14300	

BMXRECUM - Recumbent Length (cm)

Variable Name: BMXRECUM

SAS Label: Recumbent Length (cm)

English Text: Recumbent Length (cm)

Target: Both males and females 0 YEARS - 47 MONTHS

Code or Value	Value Description	Count	Cumulative	Skip to Item
49.1 to 113.9	Range of Values	1470	1470	
.	Missing	12830	14300	

BMIRECUM - Recumbent Length Comment

Variable Name: BMIRECUM

SAS Label: Recumbent Length Comment

English Text: Recumbent Length Comment

Target: Both males and females 0 MONTHS - 47 MONTHS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	43	43	
3	Not straight	0	43	
.	Missing	14257	14300	

BMXHEAD - Head Circumference (cm)

Variable Name: BMXHEAD

SAS Label: Head Circumference (cm)

English Text: Head Circumference (cm)

Target: Both males and females 0 YEARS - 6 MONTHS

Code or Value	Value Description	Count	Cumulative	Skip to Item
32.4 to 48.3	Range of Values	310	310	
.	Missing	13990	14300	

BMIHEAD - Head Circumference Comment

Variable Name: BMIHEAD

SAS Label: Head Circumference Comment

English Text: Head Circumference Comment

Target: Both males and females 0 MONTHS - 6 MONTHS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	0	0	
.	Missing	14300	14300	

BMXHT - Standing Height (cm)

Variable Name: BMXHT

SAS Label: Standing Height (cm)

English Text: Standing Height (cm)

Target: Both males and females 2 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
78.3 to 199.6	Range of Values	13157	13157	
.	Missing	1143	14300	

BMIHT - Standing Height Comment

Variable Name: BMIHT

SAS Label: Standing Height Comment

English Text: Standing Height Comment

Target: Both males and females 2 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	70	70	
3	Not straight	101	171	
.	Missing	14129	14300	

BMXBMI - Body Mass Index (kg/m**2)

Variable Name: BMXBMI

SAS Label: Body Mass Index (kg/m**2)

English Text: Body Mass Index (kg/m**2)

Target: Both males and females 2 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
11.9 to 92.3	Range of Values	13137	13137	
.	Missing	1163	14300	

BMDBMIC - BMI Category - Children/Youth

Variable Name: BMDBMIC

SAS Label: BMI Category - Children/Youth

English Text: BMI Category - Children/Youth

Target: Both males and females 2 YEARS - 19 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Underweight	163	163	
2	Normal weight	2814	2977	
3	Overweight	767	3744	
4	Obese	1005	4749	
.	Missing	9551	14300	

BMXLEG - Upper Leg Length (cm)

Variable Name: BMXLEG

SAS Label: Upper Leg Length (cm)

English Text: Upper Leg Length (cm)

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
24.8 to 55	Range of Values	10984	10984	
.	Missing	3316	14300	

BMILEG - Upper Leg Length Comment

Variable Name: BMILEG

SAS Label: Upper Leg Length Comment

English Text: Upper Leg Length Comment

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	488	488	
.	Missing	13812	14300	

BMXARML - Upper Arm Length (cm)

Variable Name: BMXARML

SAS Label: Upper Arm Length (cm)

English Text: Upper Arm Length (cm)

Target: Both males and females 2 MONTHS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
9.4 to 49.9	Range of Values	13490	13490	
.	Missing	810	14300	

BMIARML - Upper Arm Length Comment

Variable Name: BMIARML

SAS Label: Upper Arm Length Comment

English Text: Upper Arm Length Comment

Target: Both males and females 2 MONTHS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	487	487	
.	Missing	13813	14300	

BMXARMC - Arm Circumference (cm)

Variable Name: BMXARMC

SAS Label: Arm Circumference (cm)

English Text: Arm Circumference (cm)

Target: Both males and females 2 MONTHS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
11.2 to 64.5	Range of Values	13484	13484	
.	Missing	816	14300	

BMIARMC - Arm Circumference Comment

Variable Name: BMIARMC

SAS Label: Arm Circumference Comment

English Text: Arm Circumference Comment

Target: Both males and females 2 MONTHS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	493	493	
.	Missing	13807	14300	

BMXWAIST - Waist Circumference (cm)

Variable Name: BMXWAIST

SAS Label: Waist Circumference (cm)

English Text: Waist Circumference (cm)

Target: Both males and females 2 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
40 to 187.5	Range of Values	12574	12574	
.	Missing	1726	14300	

BMIWAIST - Waist Circumference Comment

Variable Name: BMIWAIST

SAS Label: Waist Circumference Comment

English Text: Waist Circumference Comment

Target: Both males and females 2 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	617	617	
.	Missing	13683	14300	

BMXHIP - Hip Circumference (cm)

Variable Name: BMXHIP

SAS Label: Hip Circumference (cm)

English Text: Hip Circumference (cm)

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
62.5 to 187.5	Range of Values	9862	9862	
.	Missing	4438	14300	

BMIHIP - Hip Circumference Comment

Variable Name: BMIHIP

SAS Label: Hip Circumference Comment

English Text: Hip Circumference Comment

Target: Both males and females 12 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Could not obtain	376	376	
.	Missing	13924	14300	