National Health and Nutrition Examination Survey

2017-March 2020 Data Documentation, Codebook, and Frequencies

Blood Pressure - Oscillometric Measurement (P_BPXO)

Data File: P_BPXO.xpt

First Published: May 2021

Last Revised: NA

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.

This section provides data for three consecutive oscillometric blood pressure (BP) measurements and other methodological measurements to obtain an accurate BP. Pulse is also reported.

Auscultatory BP measurement in NHANES ended after the 2017-2018 survey cycle. Additional details and results from a methodology study, comparing auscultatory and oscillometric BP measurement, are available in an NCHS Vital and Health Statistics Series 2 Report at NCHS website (Ostchega et al, 2021).

Eligible Sample

All examined participants, 8 years and older, in the NHANES 2017-March 2020 pre-pandemic sample were eligible. Participants with any of the following on both arms were excluded from the exam: rashes, gauze dressings, casts, edema, paralysis, tubes, open sores or wounds, withered arms, and A-V shunts. Also, women who have had an axillary nodal biopsy or resection, or a unilateral radical mastectomy do not have their blood pressure measured in the affected arm.

Protocol and Procedure

All BP measurements are taken in the mobile examination center (MEC). Prior to obtaining BP measurements, upper arm circumference is measured, which is done to guide selection of cuff size. Details on the protocol for obtaining upper arm circumference is described in the Anthropometry Procedures Manual.

After resting quietly in a seated position for 5 minutes; three consecutive BP measurements were taken 60 seconds apart using a digital upper-arm electronic measurement device, Omron HEM–907XL. This device has been previously validated by both the Association for the Advancement of Medical Instrumentation (AAMI) and the International Protocol of the European Society of Hypertension for taking BP measurements in populations aged 13 years and older (White et al, 2002; Ombani et al, 2007; Ostchega et al, 2010).

BP measurements were taken in the right arm unless specific conditions prohibited the use of the right arm, or if participants reported any reason that the measurements should not be taken in the right arm.

The NHANES 2017-2018 and 2019-2020 examination procedure manuals are available on the NHANES website.

Quality Assurance & Quality Control

The BP examiners were certified for BP measurement through a training program and followed a standardized protocol. In addition, every three months the examiners were observed by subject matter experts to assure that BP readings were obtained following the standardized protocol.

Data Processing and Editing

The following are some specifications used in capturing the BP data:

- Systolic BP cannot be greater than 300 mmHg;
- Systolic blood pressure must be greater than diastolic BP;
- If there is no systolic BP, there can be no diastolic BP. However, there can be a systolic measurement without a diastolic measurement.

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 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 exam sample weights in the demographic data file should be used to calculate estimates from the combined cycles. These exam 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.

References

- Ombani S, Riva I, Giglio A, Caldara G, Groppelli A, Parati G. Validation of the Omron M5–I, R5–I and HEM–907 automated blood pressure monitors in elderly individuals according to the international protocol of the European Society of Hypertension. Blood Press Monit 12(4):233–42. 2007.
- Ostchega Y, Nwankwo T, Chiappa M, Wolz M, Graber J, Nguyen DT. Comparing blood pressure values obtained by two different protocols: National Health and Nutrition Examination Survey, 2017–2018. National Center for Health Statistics. Vital Health Stat 2(187). 2021. https://www.cdc.gov/nchs/data/series/sr_02/s02-187-508.pdf
- Ostchega Y, Nwankwo T, Sorlie PD, Wolz M, Zipf G. Assessing the validity of the Omron HEM–907XL oscillometric blood pressure measurement device in a national survey environment. J Clin Hypertens (Greenwich) 12(1):22–8. 2010.
- White WB, Anwar YA. Evaluation of the overall efficacy of the Omron office digital blood pressure HEM–10. El Assaad MA, Topouchian JA, Darné BM, Asmar RG. Validation of the Omron HEM–907 device for blood pressure measurement. Blood Press Monit 7(4):237–41. 2002.

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 8 YEARS - 150 YEARS

BPAOARM - Arm selected - oscillometric

Variable Name: BPAOARM

SAS Label: Arm selected - oscillometric

English Text: Arm selected - oscillometric

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
L	Left	47	47	
R	Right	9457	9504	
< blank >	Missing	2152	11656	

BPAOCSZ - Coded cuff size - oscillometric

Variable Name: BPAOCSZ

SAS Label: Coded cuff size - oscillometric

English Text: Mid arm circumference (cm) cuffing parameters - oscillometric

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
2	17-21.9 (bladder size = 9.20 x 16.68 cm)	594	594	
3	22-31.9 (bladder size = 12.49 x 23.52 cm)	4601	5195	
4	32-41.9 (bladder size = 14.98 x 31.19 cm)	4562	9757	
5	42-50 (bladder size = 17.98 x 37.89 cm)	616	10373	
.	Missing	1283	11656	

BPXOSY1 - Systolic - 1st oscillometric reading

Variable Name: BPXOSY1

SAS Label: Systolic - 1st oscillometric reading

English Text: Systolic - 1st oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
52 to 225	Range of Values	10352	10352	
.	Missing	1304	11656	

BPXODI1 - Diastolic - 1st oscillometric reading

Variable Name: BPXODI1

SAS Label: Diastolic - 1st oscillometric reading

English Text: Diastolic - 1st oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
31 to 151	Range of Values	10352	10352	
.	Missing	1304	11656	

BPXOSY2 - Systolic - 2nd oscillometric reading

Variable Name: BPXOSY2

SAS Label: Systolic - 2nd oscillometric reading

English Text: Systolic - 2nd oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
54 to 222	Range of Values	10327	10327	
.	Missing	1329	11656	

BPXODI2 - Diastolic - 2nd oscillometric reading

Variable Name: BPXODI2

SAS Label: Diastolic - 2nd oscillometric reading

English Text: Diastolic - 2nd oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
28 to 146	Range of Values	10327	10327	
.	Missing	1329	11656	

BPXOSY3 - Systolic - 3rd oscillometric reading

Variable Name: BPXOSY3

SAS Label: Systolic - 3rd oscillometric reading

English Text: Systolic - 3rd oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
55 to 220	Range of Values	10286	10286	
.	Missing	1370	11656	

BPXODI3 - Diastolic - 3rd oscillometric reading

Variable Name: BPXODI3

SAS Label: Diastolic - 3rd oscillometric reading

English Text: Diastolic - 3rd oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
30 to 145	Range of Values	10286	10286	
.	Missing	1370	11656	

BPXOPLS1 - Pulse - 1st oscillometric reading

Variable Name: BPXOPLS1

SAS Label: Pulse - 1st oscillometric reading

English Text: Pulse - 1st oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
34 to 142	Range of Values	9471	9471	
.	Missing	2185	11656	

BPXOPLS2 - Pulse - 2nd oscillometric reading

Variable Name: BPXOPLS2

SAS Label: Pulse - 2nd oscillometric reading

English Text: Pulse - 2nd oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
34 to 141	Range of Values	9448	9448	
.	Missing	2208	11656	

BPXOPLS3 - Pulse - 3rd oscillometric reading

Variable Name: BPXOPLS3

SAS Label: Pulse - 3rd oscillometric reading

English Text: Pulse - 3rd oscillometric reading

Target: Both males and females 8 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
35 to 147	Range of Values	9412	9412	
.	Missing	2244	11656	