

# Vital and Health Statistics



## Anthropometric Reference Data for Children and Adults: United States, August 2021–August 2023

Analytical and Epidemiological Studies



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# Vital and Health Statistics

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## **Anthropometric Reference Data for Children and Adults: United States, August 2021–August 2023**

Analytical and Epidemiological Studies

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Centers for Disease Control and Prevention  
National Center for Health Statistics

Hyattsville, Maryland  
June 2025

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# Anthropometric Reference Data for Children and Adults: United States, August 2021–August 2023

by Cheryl D. Fryar, M.S.P.H., Qiuping Gu, M.D., Joseph Afful, M.S., Margaret D. Carroll, M.S.P.H., and Cynthia L. Ogden, Ph.D.

## Abstract

### Objective

This report presents anthropometric reference data for the U.S. population age 2 years and older during August 2021–August 2023.

### Methods

Body measurements were obtained from 8,545 National Health and Nutrition Examination Survey (NHANES) participants age 2 years and older during August 2021–August 2023. Measurements included weight, height, circumferences, and limb lengths.

### Results

Weighted population means, standard errors of the means, and selected percentiles of body measurement values are reported for participants age 2 years and

older. Body measurement results are shown by sex and age.

### Conclusions

These nationally representative NHANES data show the distribution of measured weight, height, body mass index, circumferences, and lengths in the U.S. population during August 2021–August 2023.

**Keywords:** anthropometry • body measures • nutrition surveys • National Health and Nutrition Examination Survey (NHANES)

## Introduction

Anthropometry, the science of measuring human body dimensions, serves as a key indicator of nutritional status, overall health, dietary sufficiency, and growth patterns. The National Center for Health Statistics (NCHS) provides nationally representative, in-person body measurement data collected through the National Health and Nutrition Examination Survey (NHANES), the primary source of body measurement information for the U.S. population. These measurements offer insights into the average weight, height, length, and circumferences of U.S. children, adolescents, and adults. Previous reports by NCHS have detailed anthropometric reference tables that describe the distribution of various body measurements within the U.S. population during 1988–2018 (1–6). This report presents updated anthropometric reference data collected through NHANES from August 2021 to August 2023 for age 2 years and older by sex and age.

## Methods

NHANES, conducted by NCHS, collects data in household interviews followed by health examinations in mobile examination centers (MECs). The MECs are staffed by full-time personnel, including health technicians who perform body measurements on survey participants using a standard protocol.

Surveys were conducted on a periodic basis from 1960 to 1994. NHANES became a continuous survey in 1999 and continued through March 2020, when data collection was paused due to the COVID-19 pandemic. NHANES data collection resumed in August 2021 using a new sample design to reduce contact between interviewers and survey participants during the continuing COVID-19 pandemic. The 2-year public-use data files for August 2021–August 2023 were used for this report (7–9). During this survey period, the overall examination response rate was 25.6%.

## Sample Description

NHANES is a complex, multistage probability sample of the civilian noninstitutionalized U.S. population. The NHANES August 2021–August 2023 sample included participants of all ages (9). Due to small sample sizes for some body measurements, only those age 2 years and older are included in this report. The analytic sample for this report was based on the August 2021–August 2023 examined sample of 8,545 people age 2 years and older. Pregnant females were excluded from the tabulations of weight, body mass index (BMI), and circumference measurements.

Age for adults was categorized into 10-year age groups and age 80 and older. For participants ages 2–19 years, results were reported by 2-year age groups. This is a change from previous anthropometric reports that were based on 4 years of NHANES data and a corresponding larger sample size, with results for children and adolescents shown by single year of age.

## Body Measures

The NHANES Anthropometry Procedures Manual describes the protocol, equipment, quality control, and measurement procedures in detail (10). All NHANES participants were eligible for the anthropometry examination component, although not all age groups were eligible for all measurements. A list of body measures by age eligibility, collected by NHANES from 1999–2000 through August 2021–August 2023, is included in Appendix [Table I](#).

Weight was measured to the nearest 0.1 kilogram using a digital floor scale.

Upper arm length was measured with a tape measure from the posterior border of the acromion process to the tip of the olecranon process; during the measurement, the upper arm length midpoint was marked. The mid-arm circumference was measured with a tape measure at the marked point. Upper arm length and mid-arm circumference were measured to the nearest 0.1 centimeter.

Standing height or stature and waist circumference were measured to the nearest 0.1 centimeter on participants. Standing height was measured with a wall-mounted stadiometer. Waist circumference was measured with a tape measure at the uppermost lateral border of the hip crest (ilium).

Upper leg length was measured on participants age 8 and older. Upper leg measurements to the nearest 0.1 centimeter were taken on seated participants; the distance from the inguinal crease to the distal end of the femur was measured. Hip circumference was measured to the nearest 0.1 centimeter on participants age 12 years and older.

Weight and standing height values were recorded automatically. The other body measurement data were

recorded using computer-assisted data entry. All results were based on a single body measurement examination.

One index is reported, BMI, calculated as weight in kilograms divided by height in meters squared ( $\text{kg}/\text{m}^2$ ). BMI is often used to define obesity.

## Statistical Analysis

Unweighted sample sizes and weighted means, standard errors, and selected percentiles were estimated. Data were weighted using examination sample weights to produce national estimates. The NHANES examination sample weights incorporate the differential probabilities of selection and include adjustments for noncoverage and nonresponse. Standard errors were estimated using SUDAAN by Taylor series linearization because of the complex sample design (11).

All estimates of means and percentiles were considered statistically reliable based on not having less than 8 degrees of freedom or a relative standard error greater than 30%. Although NCHS now uses new criteria for presentation of proportions (12), similar criteria for means and percentiles have not been established. Estimates with standard errors for the percentile that could not be calculated using SUDAAN were omitted from the tables and are identified with a dagger (†).

## Results

A list of detailed tables with distributions for the various body measurements and BMI is found in the text [Table](#). [Tables 1–20](#) contain the sample size, mean, standard error, and selected percentiles for the different measures. Results are reported by sex and age group. For example, during August 2021–August 2023, the average man age 20 and older weighed 199 pounds ([Table 4](#)) and was 68.9 inches (just under 5 feet 9 inches) tall ([Table 8](#)). The average woman age 20 and older weighed about 172 pounds (171.8) ([Table 4](#)) and was 63.5 inches (5 feet 3.5 inches) tall ([Table 8](#)). Results from previous surveys conducted from 1960 to 2018 for most measurements have been reported (1–6, 13–24). A historical summary of published body measurement reference data is available in Appendix [Table II](#).

## Discussion

This report presents the latest anthropometric reference data for U.S. children and adults. This is the first time since NHANES III (1988–1994) that hip circumference measurements have been included in the report.

Reference data derived from anthropometric measurements are widely used. The anthropometric data collected through NHANES are used for various applications, including public health research, health and safety policy formulation,

**Table. Detailed tables with body measurements or indices from the National Health and Nutrition Examination Survey, August 2021–August 2023**

Table number	Measurement unit or index	Age group (years)
1.....	Weight (kilograms)	2–19
2.....	Weight (pounds)	2–19
3.....	Weight (kilograms)	20 and older
4.....	Weight (pounds)	20 and older
5.....	Standing height (centimeters)	2–19
6.....	Standing height (inches)	2–19
7.....	Standing height (centimeters)	20 and older
8.....	Standing height (inches)	20 and older
9.....	Body mass index	2–19
10.....	Body mass index	20 and older
11.....	Waist circumference (centimeters)	2–19
12.....	Waist circumference (centimeters)	20 and older
13.....	Hip circumference (centimeters)	12–19
14.....	Hip circumference (centimeters)	20 and older
15.....	Mid-upper arm circumference (centimeters)	2–19
16.....	Mid-upper arm circumference (centimeters)	20 and older
17.....	Upper arm length (centimeters)	2–19
18.....	Upper arm length (centimeters)	20 and older
19.....	Upper leg length (centimeters)	8–19
20.....	Upper leg length (centimeters)	20 and older

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

clinical practices, and product development (25–32). These measurements serve as critical references for understanding population health trends and informing interventions aimed at improving health outcomes in adults and youth.

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**Table 1. Weight in kilograms for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Kilograms</b>								
2–3.....	125	15.0	0.3	11.5	11.9	12.5	13.2	14.6	16.4	16.9	17.8	19.2
4–5.....	155	20.3	0.4	15.0	15.5	16.3	17.3	19.5	21.8	23.6	25.1	28.0
6–7.....	122	25.5	0.6	18.0	19.4	20.4	21.6	24.1	28.4	32.1	34.0	36.2
8–9.....	171	33.5	0.8	23.0	24.5	25.2	27.4	30.5	37.4	41.3	43.5	53.8
10–11.....	140	46.7	1.6	27.2	29.6	31.3	35.7	40.5	55.8	62.5	68.5	†
12–13.....	143	58.3	1.6	37.3	39.6	42.7	47.1	55.2	63.0	75.4	81.1	†
14–15.....	145	71.2	1.9	43.4	48.4	51.6	55.0	66.2	82.8	95.2	101.7	112.3
16–17.....	136	76.3	2.7	50.6	53.1	55.7	60.0	74.0	85.7	96.3	100.4	†
18–19.....	138	77.0	2.0	51.8	53.9	56.3	62.6	72.3	86.3	95.3	103.1	110.3
<b>Female</b>												
2–3.....	100	14.5	0.3	10.8	11.3	11.9	12.5	14.5	15.9	16.4	17.2	19.2
4–5.....	151	19.5	0.3	14.9	15.5	15.9	16.5	18.3	21.2	23.2	25.9	28.7
6–7.....	149	26.0	0.6	18.0	18.7	19.7	21.2	24.5	28.2	32.1	35.7	40.2
8–9.....	135	34.3	1.3	23.0	24.6	25.5	28.0	31.4	37.8	44.0	45.3	57.3
10–11.....	151	46.0	1.2	30.2	32.3	33.4	35.3	43.2	52.5	59.7	64.4	73.6
12–13.....	161	55.4	1.4	36.6	41.3	41.9	46.5	52.3	60.9	65.3	73.1	81.4
14–15.....	126	61.9	1.8	39.7	45.1	47.3	50.6	57.1	68.7	80.4	86.4	97.4
16–17.....	147	64.4	2.0	45.2	48.1	48.8	51.6	59.7	71.6	78.6	86.6	103.2
18–19.....	128	69.1	2.1	43.2	45.4	48.9	52.7	63.7	82.6	93.0	99.3	110.7

† Estimate not shown because the standard error of the 95th percentile could not be computed.

<sup>1</sup>Age is at time of examination.

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 2. Weight in pounds for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Pounds												
2–3. ....	125	33.1	0.8	25.4	26.3	27.6	29.2	32.2	36.2	37.3	39.1	42.4
4–5. ....	155	44.8	0.9	33.2	34.3	35.9	38.1	43.1	48.0	52.0	55.4	61.7
6–7. ....	122	56.2	1.3	39.7	42.8	45.0	47.7	53.1	62.5	70.7	74.8	79.8
8–9. ....	171	73.9	1.7	50.6	53.9	55.5	60.4	67.2	82.4	91.0	95.9	118.5
10–11. ....	140	103.0	3.6	60.0	65.2	69.0	78.8	89.2	123.1	137.8	151.0	†
12–13. ....	143	128.5	3.5	82.1	87.3	94.1	103.9	121.7	138.9	166.3	178.8	†
14–15. ....	145	156.9	4.2	95.7	106.7	113.7	121.3	145.9	182.5	210.0	224.2	247.6
16–17. ....	136	168.3	5.9	111.6	117.1	122.8	132.3	163.1	189.0	212.2	221.4	†
18–19. ....	138	169.8	4.4	114.1	118.8	124.2	138.0	159.4	190.2	210.1	227.4	243.2
Female												
2–3. ....	100	32.0	0.6	23.8	25.0	26.3	27.5	32.1	35.0	36.2	38.0	42.3
4–5. ....	151	43.0	0.8	32.7	34.1	35.1	36.4	40.2	46.7	51.0	57.2	63.2
6–7. ....	149	57.4	1.4	39.8	41.2	43.5	46.7	53.9	62.1	70.8	78.6	88.7
8–9. ....	135	75.7	2.8	50.8	54.2	56.1	61.7	69.2	83.4	97.1	99.9	126.3
10–11. ....	151	101.4	2.6	66.6	71.2	73.6	77.8	95.2	115.8	131.5	142.1	162.2
12–13. ....	161	122.2	3.1	80.8	90.9	92.5	102.6	115.3	134.3	143.9	161.2	179.4
14–15. ....	126	136.5	3.9	87.5	99.3	104.2	111.6	125.8	151.6	177.2	190.5	214.7
16–17. ....	147	141.9	4.4	99.6	106.0	107.6	113.7	131.7	157.8	173.4	190.8	227.4
18–19. ....	128	152.3	4.6	95.1	100.1	107.9	116.1	140.5	182.1	205.1	218.9	244.0

† Estimate not shown because the standard error of the 95th percentile could not be computed.

<sup>1</sup>Age is at time of examination.

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 3. Weight in kilograms for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Kilograms												
20 and older. ....	2,688	90.3	0.9	60.9	66.6	70.0	75.4	86.6	100.6	111.0	118.8	131.8
20–29. ....	287	86.8	1.8	57.0	60.5	64.2	72.2	83.7	98.2	108.1	114.7	128.3
30–39. ....	385	91.4	1.1	63.6	69.8	71.1	77.1	87.1	101.5	110.0	121.0	132.5
40–49. ....	347	95.3	2.0	66.0	69.7	73.2	78.5	88.4	107.7	119.7	125.1	141.9
50–59. ....	415	92.1	1.5	61.0	68.1	71.2	76.8	87.8	102.0	113.6	119.8	138.7
60–69. ....	651	89.2	1.1	62.6	67.1	69.9	76.0	86.9	99.0	108.3	114.0	123.9
70–79. ....	446	87.7	1.5	60.8	66.2	68.8	74.5	86.6	96.5	106.8	111.7	121.3
80 and older. ....	157	81.7	0.9	58.0	63.3	66.7	70.8	79.9	90.0	96.5	99.6	108.5
Female												
20 and older. ....	3,254	77.9	0.8	50.7	54.7	57.8	62.6	73.5	89.2	99.9	107.2	119.2
20–29. ....	337	74.8	2.1	47.6	52.9	54.9	59.4	68.9	82.9	98.2	107.3	121.3
30–39. ....	491	80.9	0.9	51.4	55.4	58.9	63.1	75.0	93.3	107.9	114.6	125.9
40–49. ....	442	80.4	1.4	52.8	56.0	58.7	63.9	74.8	90.6	101.1	111.5	123.7
50–59. ....	506	81.6	0.9	53.1	57.9	60.2	65.2	78.5	95.5	105.0	111.5	121.4
60–69. ....	810	77.5	1.0	51.6	55.5	58.9	63.3	74.3	89.9	98.4	104.5	109.3
70–79. ....	494	73.8	0.8	49.8	54.6	56.8	62.0	71.7	82.4	91.4	96.3	103.5
80 and older. ....	174	67.9	0.8	46.8	50.6	52.9	57.9	65.7	75.2	83.0	87.3	94.2

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 4. Weight in pounds for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Pounds												
20 and older . . . . .	2,688	199.0	2.0	134.2	146.8	154.3	166.3	191.0	221.9	244.8	261.8	290.6
20–29 . . . . .	287	191.3	4.0	125.6	133.4	141.6	159.1	184.5	216.6	238.3	252.9	282.9
30–39 . . . . .	385	201.5	2.5	140.3	153.8	156.7	169.9	192.0	223.8	242.5	266.8	292.0
40–49 . . . . .	347	210.1	4.4	145.4	153.7	161.3	173.1	195.0	237.5	263.8	275.7	312.8
50–59 . . . . .	415	203.0	3.3	134.4	150.1	157.0	169.3	193.5	225.0	250.5	264.1	305.9
60–69 . . . . .	651	196.7	2.5	138.0	148.0	154.2	167.5	191.7	218.2	238.7	251.3	273.2
70–79 . . . . .	446	193.4	3.2	134.0	145.8	151.7	164.3	190.9	212.8	235.5	246.3	267.5
80 and older . . . . .	157	180.1	2.0	127.9	139.5	147.0	156.1	176.2	198.4	212.7	219.6	239.2
Female												
20 and older . . . . .	3,254	171.8	1.7	111.8	120.6	127.4	138.0	162.0	196.7	220.1	236.3	262.7
20–29 . . . . .	337	164.9	4.6	105.0	116.5	120.9	130.9	151.9	182.7	216.5	236.5	267.4
30–39 . . . . .	491	178.3	2.0	113.4	122.1	129.9	139.2	165.3	205.7	237.9	252.7	277.5
40–49 . . . . .	442	177.3	3.0	116.4	123.4	129.5	140.9	164.8	199.8	222.9	245.8	272.7
50–59 . . . . .	506	180.0	2.0	117.1	127.7	132.8	143.7	173.0	210.6	231.5	245.8	267.5
60–69 . . . . .	810	171.0	2.1	113.7	122.3	129.9	139.5	163.8	198.1	216.8	230.3	241.0
70–79 . . . . .	494	162.8	1.8	109.9	120.3	125.1	136.6	158.0	181.6	201.4	212.2	228.2
80 and older . . . . .	174	149.7	1.8	103.1	111.6	116.6	127.6	144.8	165.7	182.9	192.4	207.8

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 5. Height in centimeters for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
2–3 . . . . .	107	95.2	0.8	84.7	86.1	88.3	90.3	95.3	99.1	100.3	102.5	107.5
4–5 . . . . .	154	110.2	0.8	100.0	101.8	102.9	105.4	109.5	114.1	117.3	119.7	122.1
6–7 . . . . .	121	122.6	0.6	110.8	112.7	113.8	118.2	122.7	127.2	129.6	130.4	132.1
8–9 . . . . .	171	134.6	0.3	123.9	126.0	127.3	129.8	134.1	139.3	142.6	143.9	146.4
10–11 . . . . .	140	146.8	0.8	†	134.3	136.5	140.1	147.5	153.1	154.8	156.4	†
12–13 . . . . .	142	162.0	1.1	148.3	150.2	151.7	154.5	163.0	168.2	170.8	172.8	176.6
14–15 . . . . .	144	171.1	0.7	157.3	160.9	162.4	166.0	171.7	176.4	178.4	179.7	182.2
16–17 . . . . .	136	175.0	0.6	163.2	166.8	167.9	169.6	174.4	179.7	182.6	186.2	189.6
18–19 . . . . .	138	175.1	0.7	161.4	164.6	165.5	169.0	174.4	181.2	184.1	186.0	187.3
Female												
2–3 . . . . .	93	94.4	0.8	82.9	85.0	87.1	89.2	94.3	99.0	101.6	102.7	105.5
4–5 . . . . .	149	108.9	0.6	98.8	100.4	101.8	103.7	108.5	112.7	116.6	119.1	121.8
6–7 . . . . .	149	122.7	0.6	113.1	114.1	114.8	117.0	122.2	127.2	129.9	131.3	134.3
8–9 . . . . .	135	134.8	0.8	123.3	126.4	127.8	129.6	133.8	139.1	142.7	144.4	146.0
10–11 . . . . .	151	148.7	0.8	133.9	137.3	140.2	142.9	147.4	153.5	158.4	160.6	163.4
12–13 . . . . .	162	156.4	0.4	142.2	145.4	149.2	151.7	157.2	161.3	164.3	164.8	166.6
14–15 . . . . .	126	159.6	0.7	150.2	152.0	153.1	155.9	159.3	163.9	165.3	166.6	169.4
16–17 . . . . .	147	161.5	0.6	†	152.5	153.3	156.0	161.1	166.2	169.1	170.3	171.7
18–19 . . . . .	128	161.5	0.7	150.4	151.5	153.2	156.2	162.1	167.0	169.2	170.0	171.6

† Estimate not shown because the standard error of the 5th and 95th percentiles could not be computed.

<sup>1</sup>Age is at time of examination.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 6. Height in inches for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Inches												
2–3.....	107	37.5	0.3	33.3	33.9	34.8	35.5	37.5	39.0	39.5	40.4	42.3
4–5.....	154	43.4	0.3	39.4	40.1	40.5	41.5	43.1	44.9	46.2	47.1	48.1
6–7.....	121	48.3	0.3	43.6	44.4	44.8	46.5	48.3	50.1	51.0	51.3	52.0
8–9.....	171	53.0	0.1	48.8	49.6	50.1	51.1	52.8	54.9	56.1	56.7	57.6
10–11.....	140	57.8	0.3	†	52.9	53.7	55.1	58.1	60.3	60.9	61.6	†
12–13.....	142	63.8	0.4	58.4	59.1	59.7	60.8	64.2	66.2	67.2	68.0	69.5
14–15.....	144	67.4	0.3	61.9	63.4	63.9	65.4	67.6	69.5	70.2	70.7	71.7
16–17.....	136	68.9	0.2	64.2	65.7	66.1	66.8	68.7	70.8	71.9	73.3	74.7
18–19.....	138	68.9	0.3	63.6	64.8	65.1	66.5	68.7	71.4	72.5	73.2	73.7
Female												
2–3.....	93	37.2	0.3	32.6	33.5	34.3	35.1	37.1	39.0	40.0	40.5	41.5
4–5.....	149	42.9	0.2	38.9	39.5	40.1	40.8	42.7	44.4	45.9	46.9	48.0
6–7.....	149	48.3	0.2	44.5	44.9	45.2	46.1	48.1	50.1	51.2	51.7	52.9
8–9.....	135	53.1	0.3	48.5	49.8	50.3	51.0	52.7	54.8	56.2	56.9	57.5
10–11.....	151	58.5	0.3	52.7	54.1	55.2	56.2	58.0	60.4	62.4	63.2	64.3
12–13.....	162	61.6	0.2	56.0	57.2	58.7	59.7	61.9	63.5	64.7	64.9	65.6
14–15.....	126	62.8	0.3	59.1	59.8	60.3	61.4	62.7	64.5	65.1	65.6	66.7
16–17.....	147	63.6	0.2	†	60.0	60.3	61.4	63.4	65.4	66.6	67.1	67.6
18–19.....	128	63.6	0.3	59.2	59.6	60.3	61.5	63.8	65.7	66.6	66.9	67.6

† Estimate not shown because the standard error of the 5th and 95th percentiles could not be computed.

<sup>1</sup>Age is at time of examination.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 7. Height in centimeters for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
20 and older.....	2,690	175.1	0.3	162.2	165.2	167.5	170.0	175.2	180.1	183.0	184.8	187.2
20–29.....	287	176.3	0.6	162.0	167.7	169.3	171.3	176.1	181.0	184.7	185.9	188.1
30–39.....	385	176.1	0.4	163.6	166.6	168.0	171.3	176.4	180.9	183.4	185.1	187.1
40–49.....	348	176.4	0.6	162.3	166.9	169.5	171.1	176.2	182.6	185.0	186.8	189.9
50–59.....	417	174.3	0.4	163.0	164.7	167.2	169.0	174.5	179.0	181.3	183.6	185.6
60–69.....	652	174.7	0.5	161.8	165.2	167.0	169.7	175.0	179.8	182.5	184.1	186.6
70–79.....	446	172.4	0.4	159.5	162.6	164.6	167.5	172.7	176.9	179.8	181.6	184.1
80 and older.....	155	170.5	0.7	158.3	160.1	162.8	166.1	169.9	175.0	177.9	179.3	†
Female												
20 and older.....	3,307	161.2	0.2	149.6	152.0	153.9	156.4	161.2	166.1	168.6	170.4	172.5
20–29.....	357	163.5	0.4	153.2	155.1	156.1	158.4	163.3	168.2	170.8	171.9	174.6
30–39.....	511	162.5	0.4	150.1	152.8	154.8	158.2	162.8	167.4	169.5	170.8	172.9
40–49.....	444	161.7	0.3	149.8	152.3	153.7	157.2	162.0	166.3	169.0	170.4	172.1
50–59.....	507	161.2	0.3	150.4	152.6	154.4	156.4	160.8	166.2	168.4	170.4	172.4
60–69.....	816	160.5	0.3	149.6	151.6	153.4	155.6	160.4	165.1	167.6	169.4	171.2
70–79.....	496	158.3	0.4	148.6	150.7	152.2	154.4	157.9	162.3	164.4	166.2	168.2
80 and older.....	176	156.8	0.4	143.7	145.9	149.6	151.2	156.9	161.9	164.6	165.5	†

† Estimate not shown because the standard error of the 95th percentile could not be computed.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 8. Height in inches for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Inches</b>								
20 and older.....	2,690	68.9	0.1	63.9	65.0	65.9	66.9	69.0	70.9	72.1	72.7	73.7
20–29.....	287	69.4	0.2	63.8	66.0	66.6	67.5	69.3	71.2	72.7	73.2	74.1
30–39.....	385	69.3	0.2	64.4	65.6	66.1	67.4	69.5	71.2	72.2	72.9	73.7
40–49.....	348	69.4	0.3	63.9	65.7	66.7	67.4	69.4	71.9	72.9	73.5	74.8
50–59.....	417	68.6	0.2	64.2	64.9	65.8	66.6	68.7	70.5	71.4	72.3	73.1
60–69.....	652	68.8	0.2	63.7	65.0	65.8	66.8	68.9	70.8	71.8	72.5	73.5
70–79.....	446	67.9	0.2	62.8	64.0	64.8	66.0	68.0	69.6	70.8	71.5	72.5
80 and older.....	155	67.1	0.3	62.3	63.0	64.1	65.4	66.9	68.9	70.0	70.6	†
<b>Female</b>												
20 and older.....	3,307	63.5	0.1	58.9	59.8	60.6	61.6	63.5	65.4	66.4	67.1	67.9
20–29.....	357	64.4	0.2	60.3	61.1	61.4	62.4	64.3	66.2	67.2	67.7	68.7
30–39.....	511	64.0	0.1	59.1	60.2	60.9	62.3	64.1	65.9	66.7	67.2	68.1
40–49.....	444	63.7	0.1	59.0	60.0	60.5	61.9	63.8	65.5	66.5	67.1	67.7
50–59.....	507	63.5	0.1	59.2	60.1	60.8	61.6	63.3	65.4	66.3	67.1	67.9
60–69.....	816	63.2	0.1	58.9	59.7	60.4	61.3	63.1	65.0	66.0	66.7	67.4
70–79.....	496	62.3	0.1	58.5	59.3	59.9	60.8	62.2	63.9	64.7	65.4	66.2
80 and older.....	176	61.7	0.2	56.6	57.5	58.9	59.5	61.8	63.8	64.8	65.2	†

† Estimate not shown because the standard error of the 95th percentile could not be computed.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 9. Body mass index values for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Body mass index</b>								
2–3	107	16.8	0.2	†	14.6	15.0	15.5	16.6	17.5	18.2	18.6	19.2
4–5	154	16.6	0.2	14.0	14.5	14.7	15.2	16.0	17.4	17.9	18.5	21.8
6–7	121	16.9	0.3	13.5	14.1	14.6	14.8	16.1	17.7	20.0	21.0	22.2
8–9	171	18.3	0.4	14.0	14.3	14.8	15.5	17.2	19.6	21.9	23.2	26.8
10–11	140	21.3	0.7	15.2	15.4	16.0	16.7	19.0	25.0	26.6	29.6	33.3
12–13	142	22.1	0.5	16.1	16.7	17.3	18.1	20.3	24.8	27.5	28.4	32.8
14–15	144	24.2	0.6	16.2	17.0	18.5	19.5	21.6	27.6	32.3	35.0	38.1
16–17	136	24.9	0.7	16.9	17.7	18.1	20.1	23.7	27.9	30.5	33.2	36.0
18–19	138	25.0	0.7	17.4	18.7	19.5	20.4	23.6	27.9	32.3	32.7	36.9
<b>Female</b>				<b>Body mass index</b>								
2–3	93	16.4	0.3	†	14.2	14.4	15.1	16.1	17.4	18.1	18.4	19.1
4–5	149	16.3	0.2	13.6	14.1	14.3	14.8	15.6	16.8	18.5	19.9	21.3
6–7	149	17.1	0.4	13.5	14.0	14.2	14.9	15.9	17.9	20.7	21.9	23.0
8–9	135	18.7	0.5	13.8	14.5	14.9	15.4	17.7	20.7	22.5	25.0	26.8
10–11	151	20.6	0.4	15.0	15.9	16.3	16.8	19.4	24.0	25.1	27.4	29.2
12–13	161	22.6	0.6	16.6	17.2	17.9	18.8	21.4	24.9	26.6	28.3	32.3
14–15	126	24.2	0.6	†	17.9	18.8	19.7	22.2	27.3	30.2	33.4	37.4
16–17	147	24.6	0.7	17.9	18.1	19.0	20.0	22.6	27.6	30.3	33.3	36.4
18–19	128	26.4	0.8	17.3	18.1	18.9	20.8	24.7	30.1	33.0	34.9	41.4

† Estimate not shown because the standard error of the 5th percentile could not be computed.  
<sup>1</sup>Age is at time of examination.

NOTES: Data exclude pregnant females. Body mass index (BMI) is calculated as: BMI equals weight in kilograms divided by height in meters squared. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 10. Body mass index values for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Body mass Index</b>								
20 and older	2,680	29.4	0.3	20.9	22.3	23.4	24.9	28.2	32.6	35.1	37.8	42.1
20–29	287	27.8	0.5	18.9	19.9	21.6	23.3	27.0	31.1	34.2	36.1	39.6
30–39	385	29.5	0.4	21.2	22.7	23.3	24.9	27.8	33.0	35.6	38.0	42.5
40–49	347	30.5	0.6	22.2	23.3	24.1	25.7	28.9	33.5	35.8	39.2	45.0
50–59	415	30.2	0.4	21.6	23.0	24.1	25.5	29.0	33.3	36.6	38.9	44.6
60–69	650	29.2	0.3	21.2	22.7	23.9	25.2	28.3	32.1	34.1	36.0	39.9
70–79	444	29.4	0.4	21.6	22.9	23.9	25.6	28.8	32.3	34.6	36.5	39.2
80 and older	152	27.8	0.4	21.1	22.8	24.2	24.6	27.2	30.2	32.1	32.6	34.8
<b>Female</b>				<b>Body mass Index</b>								
20 and older	3,249	30.0	0.3	19.7	21.5	22.4	24.1	28.3	34.4	38.4	40.9	44.9
20–29	336	28.0	0.7	18.6	19.9	21.0	22.2	25.5	31.6	36.6	39.7	45.6
30–39	490	30.5	0.4	19.7	21.3	22.3	24.2	28.6	35.2	40.4	42.1	47.4
40–49	441	30.7	0.6	19.7	21.9	23.0	24.6	28.5	35.1	38.8	41.0	45.6
50–59	506	31.4	0.3	20.8	22.3	23.4	24.9	30.0	36.5	40.2	42.4	45.9
60–69	810	30.1	0.4	20.0	22.0	23.1	24.8	28.8	34.5	37.9	40.0	42.5
70–79	493	29.5	0.4	20.7	22.0	23.2	24.7	28.0	33.4	36.5	38.3	42.2
80 and older	173	27.7	0.4	19.2	21.1	22.0	23.6	26.9	31.3	33.3	34.7	36.3

NOTES: Data exclude pregnant females. Body mass index (BMI) is calculated as: BMI equals weight in kilograms divided by height in meters squared. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 11. Waist circumference in centimeters for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Centimeters</b>								
2–3.....	106	49.8	0.5	43.7	45.5	45.9	47.3	49.3	51.4	52.7	53.3	56.6
4–5.....	150	54.5	0.6	46.0	48.2	48.8	50.7	53.4	56.0	58.4	62.8	68.3
6–7.....	116	57.9	1.0	†	51.1	51.7	52.8	55.6	61.2	66.4	69.0	73.0
8–9.....	167	63.9	0.9	53.2	54.3	55.4	56.7	60.4	68.3	73.1	75.9	84.6
10–11.....	139	73.8	1.7	†	57.1	59.0	61.3	68.2	83.4	92.4	97.5	105.8
12–13.....	139	78.3	1.3	61.2	62.7	64.0	67.2	73.2	87.4	91.9	96.1	†
14–15.....	139	83.1	1.5	63.6	66.9	68.5	69.6	77.1	91.8	105.5	109.9	116.7
16–17.....	133	85.3	2.0	†	67.8	68.8	73.4	81.3	93.9	102.2	109.1	116.7
18–19.....	134	87.0	1.9	68.4	70.4	71.9	75.5	81.9	97.3	103.5	107.3	115.3
<b>Female</b>				<b>Centimeters</b>								
2–3.....	88	49.2	0.5	41.3	43.3	44.8	46.1	49.4	51.2	53.3	53.7	57.6
4–5.....	141	54.1	0.6	46.7	48.5	49.1	50.2	52.0	55.5	60.5	64.5	67.3
6–7.....	146	59.4	0.9	49.5	50.7	51.4	53.4	57.3	61.2	69.0	73.0	78.4
8–9.....	133	65.0	1.2	52.7	54.2	55.2	56.5	62.6	69.0	76.4	80.8	87.7
10–11.....	150	72.1	0.8	57.3	60.1	60.9	62.9	69.3	79.9	86.7	89.5	93.4
12–13.....	155	76.7	1.1	62.5	64.8	66.4	67.5	74.9	81.1	86.2	92.6	97.3
14–15.....	118	80.2	1.5	†	66.3	67.3	70.0	77.2	87.0	97.3	99.3	104.2
16–17.....	141	82.2	1.5	65.2	67.1	68.6	71.1	78.6	89.8	97.9	104.6	109.0
18–19.....	124	85.0	1.7	64.5	67.0	68.0	71.4	80.7	92.4	100.5	108.0	119.4

† Estimate not shown because the standard error of the 5th and 95th percentiles could not be computed.

<sup>1</sup>Age is at time of examination.

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 12. Waist circumference in centimeters for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Centimeters</b>								
20 and older.....	2,605	103.0	0.7	79.3	83.5	86.8	91.4	100.9	112.3	119.8	124.3	133.2
20–29.....	282	95.1	1.3	71.3	75.7	77.9	82.6	93.4	106.1	112.6	117.8	124.4
30–39.....	378	101.3	0.9	80.3	82.6	85.9	90.0	98.6	109.9	118.9	123.1	130.5
40–49.....	340	104.7	1.4	83.7	86.6	88.3	92.2	101.5	114.0	120.7	127.7	139.6
50–59.....	407	106.4	1.0	83.2	88.2	90.5	94.2	104.3	114.8	123.4	128.4	137.0
60–69.....	631	105.4	0.9	84.2	87.4	90.2	95.5	104.5	113.1	119.5	123.4	132.2
70–79.....	429	107.5	1.1	84.6	88.6	92.8	97.3	106.6	117.1	122.6	126.5	131.3
80 and older.....	138	104.1	1.1	84.5	89.6	92.8	95.3	102.6	111.4	117.0	120.5	126.0
<b>Female</b>				<b>Centimeters</b>								
20 and older.....	3,121	97.9	0.7	73.8	77.0	80.0	84.9	95.7	109.2	116.9	121.5	129.2
20–29.....	329	90.5	1.7	68.5	72.3	74.5	77.2	85.3	98.5	112.3	118.6	127.3
30–39.....	472	97.8	0.8	72.6	75.6	78.2	83.9	93.1	108.8	121.6	126.6	133.6
40–49.....	420	98.2	1.0	75.3	77.0	81.3	85.2	95.7	109.2	115.9	121.6	130.8
50–59.....	491	101.5	0.6	77.7	81.5	84.0	88.4	100.8	112.6	119.3	122.0	130.8
60–69.....	782	100.3	0.7	77.1	81.7	83.6	88.8	99.6	110.4	117.1	120.7	125.5
70–79.....	465	99.6	0.8	76.7	81.2	84.6	89.1	98.9	108.4	115.3	119.3	123.7
80 and older.....	162	96.5	1.1	76.4	79.3	84.1	88.8	94.4	107.2	110.5	111.9	119.1

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 13. Hip circumference in centimeters for children and adolescents ages 12–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
12–13. . . . .	131	90.5	1.0	74.2	77.4	80.4	82.8	89.2	95.3	101.9	103.9	112.1
14–15. . . . .	136	97.0	1.3	76.9	81.6	85.1	87.2	93.6	104.5	110.9	118.3	124.5
16–17. . . . .	132	99.9	1.5	†	85.5	87.5	90.6	99.2	105.5	109.6	116.9	121.8
18–19. . . . .	134	100.1	1.4	84.1	85.1	87.9	90.6	98.2	107.1	111.8	114.3	123.5
Female												
12–13. . . . .	153	91.9	1.1	76.8	79.6	82.6	84.6	90.5	96.2	101.7	105.1	112.6
14–15. . . . .	117	96.9	1.3	†	85.7	87.1	88.9	94.1	102.8	108.2	111.3	121.5
16–17. . . . .	140	99.1	1.3	85.5	86.6	87.0	89.5	96.6	104.4	109.1	114.3	122.4
18–19. . . . .	123	101.8	1.5	83.9	87.2	88.4	91.1	99.2	110.0	113.2	119.4	130.3

† Estimate not shown because the standard error of the 5th percentile could not be computed.  
<sup>1</sup>Age is at time of examination.

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 14. Hip circumference in centimeters for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
20 and older. . . . .	2,569	105.6	0.5	89.5	92.6	94.5	97.7	103.6	110.8	115.8	120.7	129.1
20–29. . . . .	278	104.5	0.9	87.0	89.6	92.5	96.2	103.0	110.1	115.4	119.4	127.8
30–39. . . . .	375	106.3	0.7	91.0	93.7	95.6	98.5	104.7	111.2	115.6	121.0	127.6
40–49. . . . .	334	107.4	1.1	92.1	94.2	96.3	98.8	104.3	113.3	117.9	122.6	133.8
50–59. . . . .	402	106.2	0.8	89.7	92.3	94.4	97.4	103.7	110.6	119.3	122.7	134.8
60–69. . . . .	622	104.2	0.6	89.5	91.9	93.8	96.9	103.0	109.3	113.2	118.2	123.6
70–79. . . . .	422	105.0	0.8	90.0	92.3	94.0	96.8	103.2	110.5	115.3	121.1	126.1
80 and older. . . . .	136	102.5	0.8	90.3	92.0	94.0	96.1	101.4	107.1	109.0	112.7	123.0
Female												
20 and older. . . . .	3,098	109.8	0.5	89.7	92.9	95.5	98.6	106.8	118.1	126.0	131.5	138.4
20–29. . . . .	328	107.0	1.2	87.1	91.7	93.4	96.6	104.4	113.7	121.1	127.8	135.7
30–39. . . . .	466	111.6	0.7	91.0	94.0	96.5	99.9	108.1	120.0	129.9	135.2	142.0
40–49. . . . .	420	111.1	0.9	90.3	94.7	96.5	99.5	107.4	120.9	127.2	130.2	139.7
50–59. . . . .	490	111.5	0.8	90.1	93.5	96.3	99.6	108.3	121.3	128.8	133.6	139.2
60–69. . . . .	780	110.1	0.8	88.9	92.7	95.4	99.2	108.0	119.5	126.2	131.1	137.3
70–79. . . . .	460	108.6	0.7	89.4	93.1	95.6	98.7	106.4	116.1	123.3	128.3	134.4
80 and older. . . . .	154	104.7	0.7	87.7	91.1	92.8	96.8	103.1	112.2	117.0	119.8	†

† Estimate not shown because the standard error of the 95th percentile could not be computed.

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 15. Mid-upper arm circumference in centimeters for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Centimeters</b>								
2–3.....	112	16.6	0.2	14.2	15.0	15.1	15.6	16.4	17.1	18.0	18.4	19.1
4–5.....	151	18.1	0.2	15.1	15.7	16.3	16.8	17.8	18.8	19.5	20.2	21.9
6–7.....	118	19.3	0.3	†	16.6	16.9	17.5	18.7	20.1	22.9	23.5	24.1
8–9.....	169	21.5	0.3	17.2	17.7	18.3	19.0	20.3	23.4	24.6	25.9	29.5
10–11.....	139	25.1	0.6	18.5	19.4	19.8	21.5	23.5	28.0	30.8	32.8	34.5
12–13.....	140	27.1	0.4	21.0	21.8	22.6	23.9	26.1	29.6	31.3	34.1	36.0
14–15.....	141	29.7	0.6	21.7	22.8	24.4	26.0	28.7	33.4	36.2	37.8	40.4
16–17.....	133	31.4	0.7	†	24.6	25.6	27.1	31.4	34.5	37.5	38.6	40.1
18–19.....	136	31.4	0.6	23.7	25.6	26.9	27.9	30.6	34.0	37.0	38.4	40.7
<b>Female</b>				<b>Centimeters</b>								
2–3.....	91	16.6	0.2	14.2	14.7	15.0	15.4	16.3	17.6	18.0	18.2	19.0
4–5.....	147	17.9	0.2	15.2	15.7	16.0	16.5	17.4	18.3	19.5	21.8	22.7
6–7.....	147	19.8	0.3	16.3	16.4	17.0	17.8	19.1	21.0	23.0	23.7	25.7
8–9.....	135	22.1	0.5	†	18.2	18.5	19.4	21.3	24.0	25.5	27.5	29.3
10–11.....	151	24.7	0.3	19.1	20.0	20.5	21.2	23.8	27.4	29.1	30.2	32.4
12–13.....	158	26.7	0.5	20.7	21.5	22.0	23.2	25.9	28.7	31.1	33.2	35.4
14–15.....	123	28.3	0.4	19.7	22.9	23.5	25.4	26.8	30.7	32.7	35.0	38.5
16–17.....	143	29.1	0.5	23.3	23.7	24.3	25.5	27.8	31.6	33.4	35.8	39.5
18–19.....	128	30.4	0.6	22.3	23.2	23.9	25.6	29.8	33.8	37.5	38.4	40.6

† Estimate not shown because the standard error of the 5th percentile could not be computed.  
<sup>1</sup>Age is at time of examination.

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 16. Mid-upper arm circumference in centimeters for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
<b>Male</b>				<b>Centimeters</b>								
20 and older.....	2,652	34.7	0.2	27.7	29.0	30.0	31.5	34.4	37.5	39.2	40.4	42.9
20–29.....	285	34.3	0.5	25.9	27.9	29.1	31.1	34.4	37.3	38.7	40.1	42.3
30–39.....	381	35.4	0.3	28.1	29.8	30.9	32.2	34.9	38.0	39.7	40.8	43.2
40–49.....	343	36.0	0.4	28.9	30.2	31.2	32.9	35.6	38.6	40.3	42.5	44.2
50–59.....	415	35.2	0.3	28.4	29.7	30.2	31.7	34.5	38.1	39.7	41.4	44.4
60–69.....	641	34.0	0.2	27.5	29.0	29.9	31.2	33.6	36.4	37.7	39.0	40.8
70–79.....	436	33.4	0.4	27.4	28.5	29.2	30.4	33.3	35.9	37.7	39.0	40.1
80 and older.....	151	31.7	0.3	26.1	27.5	27.9	29.1	31.2	34.1	35.9	37.0	38.5
<b>Female</b>				<b>Centimeters</b>								
20 and older.....	3,198	32.9	0.2	25.1	26.4	27.2	28.7	32.1	36.1	38.9	40.5	43.6
20–29.....	333	31.9	0.5	24.3	25.3	26.0	27.6	30.9	35.1	37.6	39.8	43.3
30–39.....	480	33.9	0.3	25.6	26.5	27.2	29.7	32.6	37.5	40.9	43.2	45.9
40–49.....	436	33.6	0.5	25.5	26.8	27.8	29.2	32.5	36.6	39.3	41.2	43.9
50–59.....	500	33.8	0.2	26.4	27.5	28.5	29.8	33.1	37.4	39.4	41.0	43.7
60–69.....	801	32.8	0.3	25.3	26.7	27.8	29.0	32.2	35.9	38.5	39.9	42.2
70–79.....	481	32.1	0.2	25.1	26.3	27.0	28.6	31.6	35.2	37.3	38.6	40.6
80 and older.....	167	29.8	0.3	22.6	23.7	25.4	26.6	29.3	32.8	34.2	35.2	37.4

NOTES: Data exclude pregnant females. Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 17. Upper arm length in centimeters for children and adolescents ages 2–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
2–3.....	112	19.4	0.2	16.3	17.1	17.6	18.0	19.2	20.2	20.9	21.6	22.0
4–5.....	151	22.6	0.2	20.0	20.5	20.9	21.4	22.5	23.7	24.1	24.6	25.9
6–7.....	118	25.7	0.2	22.1	22.9	23.5	24.3	26.0	27.0	27.7	28.0	28.5
8–9.....	169	28.7	0.1	25.3	25.9	26.2	27.2	28.7	29.9	30.5	31.3	32.5
10–11.....	139	31.8	0.2	27.0	28.4	28.9	29.7	31.8	33.6	34.5	35.2	36.4
12–13.....	140	35.5	0.3	31.7	32.3	33.1	33.8	35.5	37.3	38.0	38.4	39.0
14–15.....	141	37.8	0.2	33.4	34.3	35.0	35.9	37.9	39.1	40.4	41.1	42.3
16–17.....	133	39.1	0.2	35.9	36.5	37.0	37.4	38.9	40.2	41.3	41.9	42.6
18–19.....	136	38.6	0.2	34.7	35.4	35.9	36.8	38.5	40.1	41.4	41.9	42.2
Female												
2–3.....	91	19.3	0.2	16.5	16.9	17.0	18.1	19.2	20.5	21.1	21.4	21.8
4–5.....	147	22.3	0.2	19.5	20.1	20.2	20.8	22.3	23.7	24.1	24.6	25.4
6–7.....	147	25.7	0.1	22.9	23.5	23.9	24.4	25.5	26.9	27.7	27.9	28.4
8–9.....	135	28.4	0.3	25.1	26.0	26.3	26.9	28.1	29.6	30.4	31.3	32.2
10–11.....	151	32.3	0.2	27.8	29.3	30.1	30.5	32.0	33.7	35.1	35.8	36.0
12–13.....	158	34.2	0.2	30.5	31.3	31.8	32.6	34.2	35.6	36.8	37.1	37.9
14–15.....	123	35.0	0.2	31.5	32.0	32.4	34.2	35.0	36.4	37.1	37.5	38.0
16–17.....	143	35.5	0.3	†	32.7	33.2	34.0	35.4	37.0	37.8	38.3	39.0
18–19.....	128	35.4	0.3	31.6	32.1	33.2	33.9	35.4	36.9	37.3	37.7	38.6

† Estimate not shown because the standard error of the 5th percentile could not be computed.

<sup>1</sup>Age is at time of examination.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 18. Upper arm length in centimeters for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
20 and older.....	2,654	39.6	0.1	35.8	36.6	37.1	38.0	39.5	41.0	42.0	42.5	43.5
20–29.....	285	39.4	0.2	35.7	36.5	37.1	37.8	39.4	40.7	41.3	42.0	43.2
30–39.....	381	39.3	0.1	36.0	36.9	37.1	38.0	39.1	40.5	41.6	42.0	42.8
40–49.....	343	39.6	0.2	35.6	36.2	36.9	38.0	39.7	41.1	42.2	42.8	43.9
50–59.....	416	39.5	0.2	36.0	36.9	37.2	37.9	39.5	40.9	41.7	42.2	42.9
60–69.....	641	39.9	0.2	35.9	36.8	37.4	38.3	39.9	41.7	42.5	42.9	43.8
70–79.....	436	39.6	0.2	35.4	36.1	36.9	37.9	39.6	41.2	42.3	42.9	43.9
80 and older.....	152	39.9	0.5	35.5	36.5	36.9	38.0	39.9	41.5	42.9	43.7	44.3
Female												
20 and older.....	3,239	36.2	0.1	32.4	33.2	33.8	34.6	36.1	37.6	38.4	39.0	39.8
20–29.....	352	36.0	0.2	32.5	33.3	33.8	34.6	35.9	37.3	38.2	38.9	39.5
30–39.....	500	36.3	0.1	32.3	33.1	33.6	34.5	36.4	37.9	38.6	39.0	39.9
40–49.....	437	36.1	0.2	32.2	32.9	33.5	34.6	36.0	37.6	38.5	39.1	39.6
50–59.....	500	36.2	0.2	32.2	33.4	33.9	34.6	36.0	37.9	38.5	39.1	39.9
60–69.....	800	36.3	0.1	32.8	33.3	33.9	34.6	36.3	37.7	38.5	39.0	39.9
70–79.....	482	36.1	0.1	32.5	33.4	33.8	34.5	36.1	37.3	38.0	38.7	39.8
80 and older.....	168	36.0	0.2	32.1	32.7	33.5	34.5	36.1	37.2	37.9	38.4	†

† Estimate not shown because the standard error of the 95th percentile could not be computed.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 19. Upper leg length in centimeters for children and adolescents ages 8–19 years and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group (years) <sup>1</sup>	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
8–9.....	163	31.4	0.2	27.3	28.0	28.5	29.5	31.1	32.7	34.0	35.2	36.5
10–11.....	137	35.2	0.3	29.9	31.1	31.9	32.9	35.2	37.4	37.9	38.7	39.6
12–13.....	136	39.1	0.3	34.0	34.9	36.2	36.8	38.9	41.1	42.5	42.9	43.5
14–15.....	135	41.6	0.2	36.7	37.5	38.8	39.9	41.3	43.5	44.3	45.0	46.7
16–17.....	132	42.3	0.3	38.0	38.8	39.5	40.3	42.1	44.5	45.3	46.0	46.5
18–19.....	135	41.9	0.2	37.2	38.3	38.9	39.5	41.9	44.0	45.2	45.5	46.4
Female												
8–9.....	129	31.5	0.3	27.2	28.3	28.6	29.4	31.6	33.0	33.5	34.7	35.8
10–11.....	147	35.2	0.2	30.9	32.1	32.7	33.2	35.0	36.8	38.0	38.8	39.3
12–13.....	156	37.3	0.2	32.5	34.6	35.0	35.5	37.1	39.0	40.0	40.7	41.2
14–15.....	119	37.9	0.3	34.4	35.0	35.7	36.2	37.2	39.4	40.3	40.8	42.5
16–17.....	139	37.8	0.3	†	34.8	35.2	35.9	37.7	39.9	40.3	41.0	42.1
18–19.....	123	38.3	0.4	34.6	35.2	35.4	36.5	38.0	39.9	40.7	41.5	43.0

† Estimate not shown because the standard error of the 5th percentile could not be computed.

<sup>1</sup>Age is at time of examination.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table 20. Upper leg length in centimeters for adults age 20 and older and number of examined people, mean, standard error of the mean, and selected percentiles, by sex and age: United States, August 2021–August 2023**

Sex and age group	Number of examined people	Mean	Standard error of the mean	Percentile								
				5th	10th	15th	25th	50th	75th	85th	90th	95th
Male												
Centimeters												
20 and older.....	2,559	41.0	0.2	35.8	37.1	38.0	39.1	41.0	43.1	44.1	44.8	45.9
20–29.....	277	42.3	0.3	38.1	39.2	39.6	40.3	42.0	44.4	45.1	45.8	46.4
30–39.....	374	41.9	0.2	37.5	38.5	39.0	40.0	41.7	43.8	44.6	45.0	46.2
40–49.....	331	41.3	0.2	36.0	37.5	38.5	39.3	41.4	43.2	44.0	44.8	45.9
50–59.....	397	40.4	0.2	35.4	36.5	37.5	38.4	40.3	42.2	43.4	44.1	45.1
60–69.....	618	40.4	0.2	35.0	36.4	37.2	38.4	40.5	42.5	43.3	44.1	45.1
70–79.....	425	39.4	0.1	34.4	35.5	36.2	37.3	39.4	41.2	42.2	42.9	43.7
80 and older.....	137	39.4	0.5	†	35.9	36.2	37.2	39.7	41.3	42.1	43.0	43.7
Female												
20 and older.....	3,116	36.8	0.1	31.9	33.2	33.9	34.9	36.9	38.7	39.7	40.4	41.4
20–29.....	343	38.4	0.2	34.3	35.1	35.7	36.6	38.2	40.1	40.9	41.4	42.4
30–39.....	483	37.6	0.2	32.9	34.0	34.6	35.8	37.6	39.4	40.3	41.1	42.2
40–49.....	421	37.1	0.2	32.7	33.6	34.1	35.2	37.2	38.9	39.6	40.0	41.2
50–59.....	485	36.4	0.2	31.6	32.8	33.4	34.6	36.5	38.2	39.3	40.0	40.9
60–69.....	770	36.0	0.1	31.2	32.5	33.3	34.2	36.2	37.9	38.7	39.4	40.2
70–79.....	461	35.4	0.2	31.2	32.0	32.7	33.5	35.5	37.4	38.1	38.6	39.5
80 and older.....	153	35.3	0.3	30.2	31.5	32.9	33.7	35.1	37.0	37.6	38.3	40.0

† Estimate not shown because the standard error of the 5th percentile could not be computed.

NOTE: Sample size is unweighted; estimates are weighted.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

# Appendix. Supporting Tables

**Table I. Body measurements or indices from the National Health and Nutrition Examination Survey, by age and survey period, 1999–2000 through August 2021–August 2023**

Measurement	Age	Survey period											
		1999–2000	2001–2002	2003–2004	2005–2006	2007–2008	2009–2010	2011–2012	2013–2014	2015–2016	2017–2018	2019–March 2020	August 2021–August 2023
Weight, height, and length													
Weight	All ages	x	x	x	x	x	x	x	x	x	x	x	x
Standing height	2 years and older	x	x	x	x	x	x	x	x	x	x	x	x
Recumbent length	0–47 months	x	x	x	x	x	x	x	x	x	x	x	x
Upper arm length	2 months and older	x	x	x	x	x	x	x	x	x	x	x	x
Upper leg length	8 years and older	x	x	x	x	x	x	x	x	x	x	x	x
Skinfold													
Subscapular skinfold	2 months and older	x	x	x	x	x	x	...	...	...	...	...	...
Triceps skinfold	2 months and older	x	x	x	x	x	x	...	...	...	...	...	...
Circumference and breadth													
Head circumference	0–6 months	x	x	x	x	x	x	x	x	x	x	x	x
Waist circumference	2 years and older	x	x	x	x	x	x	x	x	x	x	x	x
Sagittal abdominal diameter	8 years and older	...	...	...	...	...	...	x	x	x	...	...	...
Mid-arm circumference	2 months and older	x	x	x	x	x	x	x	x	x	x	x	x
Mid-thigh circumference	8 years and older	x	x	x	x	...	...	...	...	...	...	...	...
Maximal calf circumference	8 years and older	x	x	x	x	...	...	...	...	...	...	...	...
Hip (buttocks) circumference	12 years and older	...	...	...	...	...	...	...	...	...	x	x	x
Index													
Body mass index	2 years and older	x	x	x	x	x	x	x	x	x	x	x	x

... Category not applicable.

NOTE: Data for 2017–2018 and 2019–March 2020 were also released as a combined 2017–March 2020 data file.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

**Table II. Historical summary of published anthropometry reference data**

Measurement or index	Survey period											August 2021– August 2023
	1960–1962 <sup>1–3</sup>	1963–1965 <sup>4</sup>	1966–1970 <sup>5</sup>	1971–1974 <sup>6,7</sup>	1976–1980 <sup>8</sup>	1988–1994 <sup>9</sup>	1999–2002 <sup>10</sup>	2003–2006 <sup>11</sup>	2007–2010 <sup>12</sup>	2011–2014 <sup>13</sup>	2015–2018 <sup>14</sup>	
Weight, height, and length												
Weight	X	X	X	X	X	X	X	X	X	X	X	X
Standing height	X	X	X	X	X	X	X	X	X	X	X	X
Recumbent length	...	...	...	...	X	X	X	X	X	X	X	...
Sitting height	X	X	...	X	X	X	...	...	...	...	...	...
Knee height	X	X	...	...	...	X	...	...	...	...	...	...
Elbow rest height	X	...	...	...	...	...	...	...	...	...	...	...
Popliteal height	X	X	...	...	...	...	...	...	...	...	...	...
Thigh clearance height	X	X	...	...	...	...	...	...	...	...	...	...
Buttock-knee length	X	X	...	...	...	...	...	...	...	...	...	...
Buttock-popliteal length	X	X	...	...	...	...	...	...	...	...	...	...
Elbow-wrist length	...	X	...	...	...	...	...	...	...	...	...	...
Hand length	...	X	...	...	...	...	...	...	...	...	...	...
Upper arm length	...	X	...	...	...	X	X	X	X	X	X	X
Upper leg length	...	...	...	...	...	X	X	X	X	X	X	X
Foot length	...	X	...	...	...	...	...	...	...	...	...	...
Crown-rump length	...	...	...	...	X	...	...	...	...	...	...	...
Index												
Body mass index <sup>15</sup>	...	...	...	...	X	X	X	X	X	X	X	X
Skinfold												
Subscapular skinfold	X	X	X	X	X	X	X	X	X	...	...	...
Triceps skinfold	X	X	X	X	X	X	X	X	X	...	...	...
Thigh skinfold	...	...	...	...	...	X	...	...	...	...	...	...
Suprailiac skinfold	...	...	...	...	...	X	...	...	...	...	...	...
Circumference and breadth												
Head circumference	...	...	...	...	X	X	X	X	X	X	X	...
Chest circumference	X	X	...	X	X	...	...	...	...	...	...	...
Waist circumference	X	X	...	...	...	X	X	X	X	X	X	X
Sagittal abdominal diameter	...	...	...	...	...	...	...	...	...	X	...	...
Mid-arm circumference	X	X	X	X	X	X	X	X	X	X	X	X
Mid-thigh circumference	...	...	...	...	...	X	X	X	...	...	...	...
Hip (buttocks) circumference	...	X	...	...	...	X	...	...	...	...	...	X
Maximal calf circumference	...	...	...	...	...	...	X	X	...	...	...	...
Chest breadth	...	X	...	...	...	...	...	...	...	...	...	...
Hand breadth	...	X	...	...	...	...	...	...	...	...	...	...
Wrist breadth	...	...	...	...	...	X	...	...	...	...	...	...
Biacromial breadth	X	...	...	...	...	X	...	...	...	...	...	...
Bi-iliac breadth	...	...	...	...	...	X	...	...	...	...	...	...
Bitrochanteric breadth	...	...	...	X	X	...	...	...	...	...	...	...
Elbow breadth	...	...	...	X	X	X	...	...	...	...	...	...
Elbow-elbow breadth	X	X	...	...	...	...	...	...	...	...	...	...
Seat breadth	X	X	...	...	...	...	...	...	...	...	...	...
Foot breadth	...	X	...	...	...	...	...	...	...	...	...	...

See footnotes at end of table.

... Category not applicable.

<sup>1</sup>Stoudt HW, Damon A, McFarland R, Roberts J. Weight, height, and selected body dimensions of adults, United States, 1960–1962. *Vital Health Stat* 11. 1965 Jun;(8):1–44. PMID: 14338862. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_008.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_008.pdf).

<sup>2</sup>Stoudt HW, Damon A, McFarland RA, Roberts J. Skinfolts, body girths, biacromial diameter, and selected anthropometric indices of adults, United States, 1960–1962. *Vital Health Stat* 11. 1970 Feb;(35):1–63. PMID: 5309272. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_035acc.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_035acc.pdf).

<sup>3</sup>Roberts J. Weight by height and age of adults, United States, 1960–1962. *Vital Health Stat* 11. 1966 May;(14):1–38. PMID: 5296365. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_014acc.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_014acc.pdf).

<sup>4</sup>Malina RM, Hamill PVV, Lemeshow S. Selected body measurements of children 6–11 years, United States. *Vital Health Stat* 11. 1973 Jan;(123):1–48. PMID: 4540661. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_123acc.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_123acc.pdf).

<sup>5</sup>Hamill PVV, Johnston FE, Lemeshow S. Height and weight of youths 12–17 years, United States. *Vital Health Stat* 11. 1973 Jan;(124):1–81. PMID: 4539878s. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_124.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_124.pdf).

<sup>6</sup>Abraham S, Johnson CL, Najjar MF. Weight and height of adults 18–74 years of age: United States, 1971–74. *Vital Health Stat* 11. 1979 May;(211):1–49. PMID: 473616. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_211.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_211.pdf).

<sup>7</sup>Johnson CL, Fulwood R, Abraham S, Bryner JD. Basic data on anthropometric measurements and angular measurements of the hip and knee joints for selected age groups 1–74 years of age: United States, 1971–1975. *Vital Health Stat* 11. 1981 Apr;(219):1–68. PMID: 15806754. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_219.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_219.pdf).

<sup>8</sup>Najjar MF, Rowland M. Anthropometric reference data and prevalence of overweight: United States, 1976–80. *Vital Health Stat* 11. 1987 Oct;(238):1–73. PMID: 3424692. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_238.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_238.pdf).

<sup>9</sup>McDowell MA, Fryar CD, Ogden CL. Anthropometric reference data for children and adults: United States, 1988–1994. *Vital Health Stat* 11. 2009 Apr;(249):1–68. PMID: 19642512. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_249.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_249.pdf).

<sup>10</sup>McDowell MA, Fryar CD, Hirsch R, Ogden CL. Anthropometric reference data for children and adults: U.S. population, 1999–2002. *Adv data*. 2005 July 7;(361):1–5. PMID: 16018338. Available from: <https://www.cdc.gov/nchs/data/ad/ad361.pdf>.

<sup>11</sup>McDowell MA, Fryar CD, Ogden CL, Flegal KM. Anthropometric reference data for children and adults: United States, 2003–2006. *Natl Health Stat Report*. 2008 Oct 22;(10):1–48. PMID: 25585443. Available from: <https://www.cdc.gov/nchs/data/nhsr/nhsr010.pdf>.

<sup>12</sup>Fryar CD, Gu Q, Ogden CL. Anthropometric reference data for children and adults: United States, 2007–2010. *Vital Health Stat* 11. 2012 Oct;(252):1–48. PMID: 25204692. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_11/sr11\\_252.pdf](https://www.cdc.gov/nchs/data/series/sr_11/sr11_252.pdf).

<sup>13</sup>Fryar CD, Gu Q, Ogden CL, Flegal KM. Anthropometric reference data for children and adults: United States, 2011–2014. *Vital Health Stat* 3 *Anal Stud*. 2016 Aug;(39):1–46. PMID: 28437242. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_03/sr03\\_039.pdf](https://www.cdc.gov/nchs/data/series/sr_03/sr03_039.pdf).

<sup>14</sup>Fryar CD, Carroll MD, Gu Q, Afful J, Ogden CL. Anthropometric reference data for children and adults: United States, 2015–2018. *Vital Health Stat* 3. 2021 Jan;(46):1–44. PMID: 33541517. Available from: [https://www.cdc.gov/nchs/data/series/sr\\_03/sr03-046-508.pdf](https://www.cdc.gov/nchs/data/series/sr_03/sr03-046-508.pdf).

<sup>15</sup>Body mass index (BMI) is calculated as: BMI equals weight in kilograms divided by height in meters squared.

NOTE: Terminology for a particular measure may have changed across survey years.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey.

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