

Indicators of Diet Quality, Nutrition, and Health for Americans by Program Participation Status, 2011–2016: SNAP Report



Appendix C. Indicators Of Nutrition and Health



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Appendix C. Indicators of Nutrition and Health



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Contents

| | |
|--|------|
| Appendix C. Indicators of Nutrition and Health | C-1 |
| Table C.1. Body Mass Index Categories for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-1 |
| Table C.2. Waist Circumference Categories for SNAP Participants and Nonparticipants by Gender and Age Group | C-5 |
| Table C.3. Mean Waist-to-Height Ratios for SNAP Participants and Nonparticipants by Gender and Age Group | C-7 |
| Table C.3a. Percentile Distribution of Waist-to-Height Ratio for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-8 |
| Table C.4. Disease Risk Indicated by Body Mass Index and Waist Circumference for SNAP Participants and Nonparticipants by Gender and Age Group | C-10 |
| Table C.5. Blood Pressure Category for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-13 |
| Table C.6. High-Density Lipoprotein Status for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-17 |
| Table C.7. Low-Density Lipoprotein Category for SNAP Participants and Nonparticipants by Age Group and Gender | C-20 |
| Table C.8. Triglyceride Concentrations for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-23 |
| Table C.9. Blood Glucose Status for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-26 |
| Table C.10. Hemoglobin Status for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-29 |
| Table C.11. Vitamin B12 Status for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-32 |
| Table C.12. Serum Vitamin D Status for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-34 |
| Table C.13. Iodine Status for SNAP Participants and Nonparticipants by Age Group and Gender..... | C-37 |

Appendix C. Indicators of Nutrition and Health

Table C.1. Body Mass Index Categories for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 2+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 23,366 | – | 5,775 | – | 4,387 | – | 11,860 | – |
| Underweight | 1.9 | (0.09) | 2.6 | (0.23) | 2.0 * | (0.21) | 1.8 ** | (0.12) |
| Normal weight | 36.7 | (0.31) | 32.9 | (0.65) | 34.0 | (0.71) | 38.5 *** | (0.43) |
| Overweight | 28.7 | (0.31) | 25.8 | (0.66) | 29.2 *** | (0.72) | 29.1 *** | (0.43) |
| Obese | 32.7 | (0.32) | 38.6 | (0.71) | 34.8 *** | (0.75) | 30.6 *** | (0.43) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 11,653 | – | 2,740 | – | 2,205 | – | 6,029 | – |
| Underweight | 1.6 | (0.11) | 3.0 | (0.36) | 1.7 ** | (0.25) | 1.3 *** | (0.15) |
| Normal weight | 35.0 | (0.43) | 35.8 | (0.98) | 34.6 | (0.99) | 35.1 | (0.58) |
| Overweight | 32.4 | (0.45) | 28.7 | (1.00) | 31.9 * | (1.05) | 33.2 *** | (0.62) |
| Obese | 31.0 | (0.45) | 32.5 | (1.03) | 31.9 | (1.05) | 30.4 | (0.61) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 11,713 | – | 3,035 | – | 2,182 | – | 5,831 | – |
| Underweight | 2.3 | (0.14) | 2.3 | (0.28) | 2.2 | (0.33) | 2.2 | (0.19) |
| Normal weight | 38.3 | (0.45) | 30.1 | (0.85) | 33.5 * | (1.00) | 41.8 *** | (0.64) |
| Overweight | 25.1 | (0.42) | 23.0 | (0.86) | 26.7 ** | (1.00) | 25.2 * | (0.59) |
| Obese | 34.4 | (0.46) | 44.6 | (0.99) | 37.6 *** | (1.08) | 30.8 *** | (0.62) |
| Children 2–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 8,502 | – | 2,796 | – | 1,581 | – | 3,711 | – |
| Underweight | 3.2 | (0.19) | 3.0 | (0.33) | 2.3 | (0.38) | 3.6 | (0.31) |
| Normal weight | 63.0 | (0.52) | 59.3 | (0.95) | 56.3 | (1.24) | 66.2 *** | (0.77) |
| Overweight | 16.0 | (0.40) | 18.0 | (0.76) | 16.3 | (0.93) | 15.3 ** | (0.59) |
| Obese | 17.8 | (0.42) | 19.7 | (0.78) | 25.1 *** | (1.08) | 14.9 *** | (0.58) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Boys | | | | | | | | |
| <i>Sample size</i> | 4,286 | – | 1,411 | – | 791 | – | 1,876 | – |
| Underweight | 3.0 | (0.26) | 3.2 | (0.48) | 3.4 | (0.64) | 2.8 | (0.38) |
| Normal weight | 62.0 | (0.74) | 60.1 | (1.35) | 56.4 | (1.75) | 64.5 * | (1.10) |
| Overweight | 16.5 | (0.57) | 18.2 | (1.06) | 14.4 * | (1.25) | 16.4 | (0.86) |
| Obese | 18.4 | (0.59) | 18.5 | (1.08) | 25.8 *** | (1.53) | 16.3 | (0.85) |
| Girls | | | | | | | | |
| <i>Sample size</i> | 4,216 | – | 1,385 | – | 790 | – | 1,835 | – |
| Underweight | 3.3 | (0.27) | 2.8 | (0.45) | 1.2 ** | (0.39) | 4.5 ** | (0.48) |
| Normal weight | 64.1 | (0.74) | 58.4 | (1.34) | 56.2 | (1.76) | 68.0 *** | (1.09) |
| Overweight | 15.5 | (0.56) | 17.9 | (1.08) | 18.2 | (1.38) | 14.1 ** | (0.81) |
| Obese | 17.1 | (0.58) | 20.9 | (1.14) | 24.3 | (1.53) | 13.4 *** | (0.79) |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 10,192 | – | 2,195 | – | 1,973 | – | 5,442 | – |
| Underweight | 1.7 | (0.13) | 2.5 | (0.32) | 1.9 | (0.30) | 1.3 *** | (0.16) |
| Normal weight | 30.0 | (0.45) | 25.3 | (0.93) | 29.5 ** | (1.02) | 31.7 *** | (0.62) |
| Overweight | 31.5 | (0.46) | 27.7 | (0.96) | 32.2 ** | (1.07) | 32.3 *** | (0.63) |
| Obese | 36.8 | (0.48) | 44.4 | (1.05) | 36.4 *** | (1.10) | 34.7 *** | (0.64) |
| Men | | | | | | | | |
| <i>Sample size</i> | 5,068 | – | 990 | – | 1,006 | – | 2,766 | – |
| Underweight | 1.1 | (0.15) | 2.4 | (0.47) | 1.1 * | (0.30) | 0.9 ** | (0.18) |
| Normal weight | 27.7 | (0.61) | 29.3 | (1.44) | 29.9 | (1.42) | 26.9 | (0.83) |
| Overweight | 36.5 | (0.68) | 31.4 | (1.47) | 36.7 * | (1.55) | 37.7 *** | (0.92) |
| Obese | 34.6 | (0.67) | 36.9 | (1.53) | 32.4 * | (1.51) | 34.5 | (0.90) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Women | | | | | | | | |
| <i>Sample size</i> | 5,124 | – | 1,205 | – | 967 | – | 2,676 | – |
| Underweight | 2.2 | (0.20) | 2.7 | (0.45) | 2.8 | (0.52) | 1.8 | (0.26) |
| Normal weight | 32.3 | (0.65) | 21.3 | (1.18) | 29.1 *** | (1.45) | 36.4 *** | (0.93) |
| Overweight | 26.6 | (0.62) | 24.1 | (1.24) | 27.7 | (1.46) | 26.9 | (0.86) |
| Obese | 39.0 | (0.68) | 51.9 | (1.44) | 40.4 *** | (1.58) | 34.9 *** | (0.92) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,672 | – | 784 | – | 833 | – | 2,707 | – |
| Underweight | 1.2 | (0.16) | 2.4 | (0.55) | 1.5 | (0.42) | 0.9 ** | (0.18) |
| Normal weight | 24.3 | (0.63) | 23.4 | (1.52) | 20.2 | (1.40) | 24.9 | (0.84) |
| Overweight | 35.8 | (0.70) | 29.6 | (1.63) | 36.4 ** | (1.67) | 36.7 *** | (0.93) |
| Obese | 38.7 | (0.72) | 44.6 | (1.76) | 41.9 | (1.72) | 37.5 *** | (0.94) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,299 | – | 339 | – | 408 | – | 1,387 | – |
| Underweight | 1.0 | (0.20) | 4.7 | (1.16) | 1.3 ** | (0.53) | 0.7 *** | (0.22) |
| Normal weight | 21.3 | (0.86) | 23.4 | (2.31) | 19.5 | (1.97) | 21.2 | (1.11) |
| Overweight | 41.3 | (1.03) | 34.8 | (2.59) | 40.5 | (2.45) | 41.7 * | (1.34) |
| Obese | 36.4 | (1.01) | 37.2 | (2.62) | 38.8 | (2.43) | 36.4 | (1.31) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,373 | – | 445 | – | 425 | – | 1,320 | – |
| Underweight | 1.3 | (0.23) | 0.5 | (0.33) | 1.7 | (0.63) | 1.0 | (0.28) |
| Normal weight | 26.8 | (0.91) | 23.5 | (2.02) | 20.7 | (1.97) | 27.9 | (1.23) |
| Overweight | 31.4 | (0.95) | 25.5 | (2.08) | 33.2 * | (2.29) | 32.6 ** | (1.29) |
| Obese | 40.6 | (1.00) | 50.5 | (2.39) | 44.3 | (2.41) | 38.4 *** | (1.33) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For children, weight categories are defined as follows: underweight if Body Mass Index (BMI) for age is < the 5th percentile on the Centers for Disease Control and Prevention BMI for age growth chart; healthy weight if BMI for age is ≥ the 5th and < the 85th percentiles; overweight if BMI for age is ≥ the 85th and < the 95th percentiles; and obese if BMI for age is ≥ the 95th percentile. For adults, underweight is defined as BMI < 18.5; healthy weight as BMI ≥ 18.5 and < 25; overweight as BMI ≥ 25 and < 30; and obese as BMI ≥ 30. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 body measures data. Sample includes NHANES respondents 2 years old or older with complete day 1 dietary recall data and weight and height data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.2. Waist Circumference Categories for SNAP Participants and Nonparticipants by Gender and Age Group

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All Adults | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 14,462 | – | 2,879 | – | 2,723 | – | 7,974 | – |
| Normal | 46.0 | (0.40) | 43.3 | (0.87) | 47.3 | (0.91) | 46.7 *** | (0.54) |
| High risk | 54.0 | (0.40) | 56.7 | (0.87) | 52.7 | (0.91) | 53.3 *** | (0.54) |
| Men | | | | | | | | |
| <i>Sample size</i> | 7,215 | – | 1,299 | – | 1,376 | – | 4,085 | – |
| Normal | 55.0 | (0.57) | 56.9 | (1.34) | 59.0 | (1.30) | 53.9 * | (0.77) |
| High risk | 45.0 | (0.57) | 43.1 | (1.34) | 41.0 | (1.30) | 46.1 * | (0.77) |
| Women | | | | | | | | |
| <i>Sample size</i> | 7,247 | – | 1,580 | – | 1,347 | – | 3,889 | – |
| Normal | 37.5 | (0.55) | 30.5 | (1.12) | 36.3 | (1.27) | 39.9 *** | (0.77) |
| High risk | 62.5 | (0.55) | 69.5 | (1.12) | 63.7 | (1.27) | 60.1 *** | (0.77) |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 10,027 | – | 2,154 | – | 1,939 | – | 5,368 | – |
| Normal | 49.9 | (0.48) | 44.3 | (1.01) | 52.2 | (1.09) | 51.0 *** | (0.66) |
| High risk | 50.1 | (0.48) | 55.7 | (1.01) | 47.8 | (1.09) | 49.0 *** | (0.66) |
| Men | | | | | | | | |
| <i>Sample size</i> | 5,012 | – | 982 | – | 989 | – | 2,742 | – |
| Normal | 59.0 | (0.68) | 58.0 | (1.54) | 64.6 | (1.53) | 57.9 | (0.91) |
| High risk | 41.0 | (0.68) | 42.0 | (1.54) | 35.4 | (1.53) | 42.1 | (0.91) |
| Women | | | | | | | | |
| <i>Sample size</i> | 5,015 | – | 1,172 | – | 950 | – | 2,626 | – |
| Normal | 40.8 | (0.67) | 30.7 | (1.31) | 39.8 | (1.54) | 44.3 *** | (0.94) |
| High risk | 59.2 | (0.67) | 69.3 | (1.31) | 60.2 | (1.54) | 55.7 *** | (0.94) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,435 | – | 725 | – | 784 | – | 2,606 | – |
| Normal | 34.3 | (0.68) | 40.3 | (1.69) | 32.5 | (1.59) | 33.5 *** | (0.90) |
| High risk | 65.7 | (0.68) | 59.7 | (1.69) | 67.5 | (1.59) | 66.5 *** | (0.90) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,203 | – | 317 | – | 387 | – | 1,343 | – |
| Normal | 41.5 | (1.03) | 53.2 | (2.68) | 39.8 | (2.40) | 40.3 *** | (1.33) |
| High risk | 58.5 | (1.03) | 46.8 | (2.68) | 60.2 | (2.40) | 59.7 *** | (1.33) |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,232 | – | 408 | – | 397 | – | 1,263 | – |
| Normal | 28.5 | (0.92) | 29.9 | (2.16) | 26.6 | (2.12) | 28.1 | (1.23) |
| High risk | 71.5 | (0.92) | 70.1 | (2.16) | 73.4 | (2.12) | 71.9 | (1.23) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For men, waist circumference categories are defined as follows: high risk if waist circumference is > 40 inches, and normal if waist circumference is ≤ 40 inches. For women, waist circumference categories are defined as follows: high risk if waist circumference is > 35 inches, and normal if waist circumference ≤ 35 inches. Risk refers to risk of conditions like type 2 diabetes, hypertension, and cardiovascular disease. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 body measures data. Sample includes NHANES respondents aged 19 or older with complete day 1 dietary recall data and waist circumference data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.3. Mean Waist-to-Height Ratios for SNAP Participants and Nonparticipants by Gender and Age Group

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------------------------|----------------------------|----------------|----------------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Mean Waist-to-Height Ratio | Standard Error | Mean Waist-to-Height Ratio | Standard Error | Mean Waist-to-Height Ratio | Standard Error | Mean Waist-to-Height Ratio | Standard Error |
| All individuals 19+ years old | | | | | | | | |
| <i>Sample size</i> | 15,021 | – | 3,017 | – | 2,842 | – | 8,221 | – |
| All | 0.59 | (0.001) | 0.61 | (0.002) | 0.59 *** | (0.002) | 0.58 *** | (0.001) |
| Men | 0.58 | (0.001) | 0.58 | (0.003) | 0.58 | (0.002) | 0.58 ** | (0.001) |
| Women | 0.60 | (0.001) | 0.64 | (0.003) | 0.61 *** | (0.003) | 0.59 *** | (0.002) |
| Adults 19–59 years old | | | | | | | | |
| <i>Sample size</i> | 10,269 | – | 2,215 | – | 1,994 | – | 5,473 | – |
| All | 0.58 | (0.001) | 0.60 | (0.002) | 0.58 *** | (0.002) | 0.57 *** | (0.001) |
| Men | 0.57 | (0.001) | 0.58 | (0.003) | 0.56 ** | (0.003) | 0.57 ** | (0.002) |
| Women | 0.59 | (0.001) | 0.63 | (0.003) | 0.60 *** | (0.003) | 0.58 *** | (0.002) |
| Older adults 60+ years old | | | | | | | | |
| <i>Sample size</i> | 4,752 | – | 802 | – | 848 | – | 2,748 | – |
| All | 0.62 | (0.001) | 0.64 | (0.004) | 0.64 | (0.003) | 0.61 *** | (0.002) |
| Men | 0.61 | (0.002) | 0.61 | (0.005) | 0.63 ** | (0.004) | 0.61 | (0.002) |
| Women | 0.63 | (0.002) | 0.66 | (0.005) | 0.64 * | (0.005) | 0.62 *** | (0.003) |

See notes at end of table.

Table C.3a. Percentile Distribution of Waist-to-Height Ratio for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | 5th | 10th | 25th | 50th | 75th | 90th | 95th |
|--|------|------|------|------|------|------|------|
| Men | | | | | | | |
| All individuals | 0.44 | 0.46 | 0.52 | 0.57 | 0.63 | 0.69 | 0.74 |
| Adults 19–59 years old | 0.44 | 0.46 | 0.50 | 0.56 | 0.62 | 0.69 | 0.73 |
| Older adults 60+ years old | 0.49 | 0.52 | 0.56 | 0.60 | 0.66 | 0.71 | 0.76 |
| SNAP participants | 0.43 | 0.44 | 0.50 | 0.57 | 0.65 | 0.71 | 0.78 |
| Adults 19–59 years old | 0.43 | 0.44 | 0.50 | 0.56 | 0.65 | 0.71 | 0.78 |
| Older adults 60+ years old | 0.44 | 0.50 | 0.54 | 0.61 | 0.67 | 0.72 | 0.77 |
| Income-eligible nonparticipants | 0.43 | 0.45 | 0.50 | 0.57 | 0.62 | 0.70 | 0.74 |
| Adults 19–59 years old | 0.42 | 0.44 | 0.48 | 0.56 | 0.61 | 0.68 | 0.71 |
| Older adults 60+ years old | 0.48 | 0.53 | 0.57 | 0.62 | 0.67 | 0.75 | 0.78 |
| Higher income nonparticipants | 0.45 | 0.47 | 0.52 | 0.57 | 0.63 | 0.69 | 0.74 |
| Adults 19–59 years old | 0.45 | 0.46 | 0.51 | 0.56 | 0.62 | 0.68 | 0.73 |
| Older adults 60+ years old | 0.49 | 0.52 | 0.56 | 0.60 | 0.65 | 0.71 | 0.76 |
| Women | | | | | | | |
| All individuals | 0.45 | 0.47 | 0.53 | 0.59 | 0.67 | 0.75 | 0.79 |
| Adults 19–59 years old | 0.45 | 0.47 | 0.51 | 0.58 | 0.66 | 0.74 | 0.79 |
| Older adults 60+ years old | 0.48 | 0.52 | 0.56 | 0.62 | 0.69 | 0.75 | 0.79 |
| SNAP participants | 0.45 | 0.48 | 0.55 | 0.63 | 0.70 | 0.78 | 0.84 |
| Adults 19–59 years old | 0.44 | 0.48 | 0.53 | 0.62 | 0.70 | 0.78 | 0.84 |
| Older adults 60+ years old | 0.49 | 0.54 | 0.59 | 0.65 | 0.72 | 0.80 | 0.86 |
| Income-eligible nonparticipants | 0.45 | 0.47 | 0.53 | 0.60 | 0.67 | 0.75 | 0.79 |
| Adults 19–59 years old | 0.44 | 0.46 | 0.51 | 0.58 | 0.66 | 0.74 | 0.78 |
| Older adults 60+ years old | 0.50 | 0.53 | 0.58 | 0.64 | 0.70 | 0.76 | 0.82 |

| Subgroup | 5th | 10th | 25th | 50th | 75th | 90th | 95th |
|-------------------------------|------|------|------|------|------|------|------|
| Higher income nonparticipants | 0.45 | 0.47 | 0.52 | 0.58 | 0.66 | 0.73 | 0.78 |
| Adults 19–59 years old | 0.45 | 0.46 | 0.51 | 0.57 | 0.64 | 0.73 | 0.78 |
| Older adults 60+ years old | 0.48 | 0.51 | 0.55 | 0.61 | 0.68 | 0.74 | 0.78 |

Notes: “All individuals” includes respondents with missing SNAP participation or income. Higher waist-to-height ratio is thought to be associated with greater risk of negative metabolic health outcomes. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in means, proportions, and percentiles are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 body measures data. Sample includes NHANES respondents aged 19 and older with complete day 1 dietary recall data and waist circumference and height data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.4. Disease Risk Indicated by Body Mass Index and Waist Circumference for SNAP Participants and Nonparticipants by Gender and Age Group

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|---------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All adults | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 14,672 | – | 2,937 | – | 2,764 | – | 8,060 | – |
| Normal | 30.7 | (0.38) | 28.3 | (0.82) | 29.9 | (0.86) | 31.6 *** | (0.52) |
| Increased risk | 15.4 | (0.29) | 13.6 | (0.62) | 15.7 * | (0.68) | 15.9 ** | (0.40) |
| High risk | 18.5 | (0.31) | 16.2 | (0.67) | 19.4 ** | (0.75) | 18.6 ** | (0.42) |
| Very high risk | 28.0 | (0.37) | 31.4 | (0.84) | 27.4 *** | (0.85) | 27.1 *** | (0.49) |
| Extremely high risk | 7.3 | (0.22) | 10.5 | (0.55) | 7.6 *** | (0.51) | 6.7 *** | (0.29) |
| Men | | | | | | | | |
| <i>Sample size</i> | 7,280 | – | 1,311 | – | 1,392 | – | 4,115 | – |
| Normal | 28.0 | (0.52) | 31.9 | (1.26) | 29.6 | (1.21) | 26.9 *** | (0.69) |
| Increased risk | 24.5 | (0.51) | 21.8 | (1.13) | 25.2 * | (1.19) | 25.0 * | (0.70) |
| High risk | 15.5 | (0.41) | 13.1 | (0.91) | 16.0 * | (0.99) | 15.6 * | (0.55) |
| Very high risk | 26.8 | (0.52) | 26.9 | (1.20) | 23.8 | (1.16) | 27.5 | (0.70) |
| Extremely high risk | 5.2 | (0.27) | 6.3 | (0.67) | 5.5 | (0.62) | 5.0 | (0.35) |
| Women | | | | | | | | |
| <i>Sample size</i> | 7,392 | – | 1,626 | – | 1,372 | – | 3,945 | – |
| Normal | 33.3 | (0.54) | 24.9 | (1.06) | 30.2 *** | (1.21) | 36.1 *** | (0.76) |
| Increased risk | 7.0 | (0.30) | 5.9 | (0.57) | 6.8 | (0.68) | 7.4 * | (0.43) |
| High risk | 21.3 | (0.47) | 19.1 | (0.97) | 22.7 * | (1.12) | 21.5 * | (0.64) |
| Very high risk | 29.1 | (0.52) | 35.6 | (1.18) | 30.8 ** | (1.24) | 26.6 *** | (0.70) |
| Extremely high risk | 9.3 | (0.34) | 14.5 | (0.87) | 9.5 *** | (0.79) | 8.4 *** | (0.45) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 10,128 | – | 2,178 | – | 1,955 | – | 5,416 | – |
| Normal | 32.1 | (0.45) | 28.7 | (0.96) | 32.2 * | (1.03) | 33.2 *** | (0.63) |
| Increased risk | 17.1 | (0.36) | 14.3 | (0.74) | 17.7 ** | (0.84) | 17.8 *** | (0.50) |
| High risk | 16.0 | (0.36) | 14.8 | (0.75) | 16.9 | (0.86) | 16.0 | (0.49) |
| Very high risk | 26.9 | (0.44) | 31.3 | (0.98) | 26.1 *** | (1.00) | 25.7 *** | (0.59) |
| Extremely high risk | 7.8 | (0.26) | 10.9 | (0.66) | 7.1 *** | (0.59) | 7.3 *** | (0.35) |
| Men | | | | | | | | |
| <i>Sample size</i> | 5,044 | – | 986 | – | 996 | – | 2,758 | – |
| Normal | 29.3 | (0.62) | 32.7 | (1.47) | 31.9 | (1.44) | 28.0 ** | (0.83) |
| Increased risk | 26.7 | (0.62) | 22.7 | (1.33) | 27.4 * | (1.44) | 27.4 ** | (0.85) |
| High risk | 12.6 | (0.46) | 10.7 | (0.99) | 13.6 | (1.12) | 12.7 | (0.62) |
| Very high risk | 26.0 | (0.61) | 26.7 | (1.39) | 22.0 * | (1.34) | 26.8 | (0.83) |
| Extremely high risk | 5.4 | (0.32) | 7.2 | (0.82) | 5.0 * | (0.71) | 5.1 * | (0.42) |
| Women | | | | | | | | |
| <i>Sample size</i> | 5,084 | – | 1,192 | – | 959 | – | 2,658 | – |
| Normal | 34.9 | (0.66) | 24.7 | (1.23) | 32.6 *** | (1.48) | 38.4 *** | (0.94) |
| Increased risk | 7.7 | (0.37) | 6.0 | (0.66) | 8.0 | (0.87) | 8.3 ** | (0.54) |
| High risk | 19.4 | (0.55) | 18.8 | (1.13) | 20.1 | (1.30) | 19.2 | (0.75) |
| Very high risk | 27.8 | (0.62) | 35.9 | (1.39) | 30.1 ** | (1.48) | 24.7 *** | (0.83) |
| Extremely high risk | 10.2 | (0.42) | 14.6 | (1.03) | 9.2 *** | (0.94) | 9.5 *** | (0.56) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,544 | – | 759 | – | 809 | – | 2,644 | – |
| Normal | 26.5 | (0.64) | 27.1 | (1.58) | 22.8 * | (1.44) | 26.7 | (0.86) |
| Increased risk | 10.3 | (0.43) | 11.5 | (1.12) | 9.9 | (0.97) | 10.3 | (0.56) |
| High risk | 26.0 | (0.64) | 20.4 | (1.42) | 27.1 ** | (1.54) | 26.7 *** | (0.85) |
| Very high risk | 31.3 | (0.68) | 31.6 | (1.63) | 31.2 | (1.61) | 31.2 | (0.90) |
| Extremely high risk | 5.9 | (0.35) | 9.4 | (0.99) | 8.9 | (0.99) | 5.1 *** | (0.43) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|---------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,236 | – | 325 | – | 396 | – | 1,357 | – |
| Normal | 23.5 | (0.88) | 29.3 | (2.45) | 21.6 * | (2.02) | 23.0 * | (1.13) |
| Increased risk | 17.1 | (0.79) | 18.6 | (2.10) | 17.8 | (1.88) | 16.8 | (1.02) |
| High risk | 25.1 | (0.89) | 20.9 | (2.17) | 23.9 | (2.12) | 25.4 | (1.16) |
| Very high risk | 29.7 | (0.95) | 27.5 | (2.37) | 29.7 | (2.27) | 30.1 | (1.25) |
| Extremely high risk | 4.7 | (0.45) | 3.6 | (0.98) | 7.0 * | (1.27) | 4.7 | (0.59) |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,308 | – | 434 | – | 413 | – | 1,287 | – |
| Normal | 28.8 | (0.92) | 25.3 | (2.05) | 23.8 | (2.04) | 29.6 | (1.25) |
| Increased risk | 4.9 | (0.44) | 5.8 | (1.12) | 3.5 | (0.89) | 5.1 | (0.60) |
| High risk | 26.7 | (0.90) | 19.9 | (1.88) | 29.7 *** | (2.20) | 27.8 *** | (1.23) |
| Very high risk | 32.7 | (0.95) | 34.8 | (2.24) | 32.5 | (2.26) | 32.0 | (1.27) |
| Extremely high risk | 6.9 | (0.52) | 14.1 | (1.60) | 10.4 | (1.47) | 5.5 *** | (0.63) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. Normal refers to the population with normal weight and waist circumference. Increased risk of disease is present when an individual is overweight and has a normal waist circumference (≤ 40 inches for men and ≤ 35 inches for women). High risk of disease is present when an individual is obese (level I) with a normal waist circumference or overweight with a high-risk waist circumference. Very high risk of disease is present when an individual is obese (level II) with a normal waist circumference or obese (level I or II) with a high-risk waist circumference. Extremely high risk of disease is present when an individual is extremely obese (level III) with either a normal or high-risk waist circumference. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 body measures data. Sample includes NHANES respondents aged 19 and older with complete day 1 dietary recall data and height, weight, and waist circumference data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.5. Blood Pressure Category for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 8+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 19,924 | – | 4,503 | – | 3,794 | – | 10,454 | – |
| Normal | 54.8 | (0.34) | 51.9 | (0.73) | 54.5 * | (0.78) | 55.2 *** | (0.46) |
| Elevated | 15.4 | (0.27) | 16.1 | (0.60) | 15.5 | (0.62) | 15.3 | (0.36) |
| Hypertension stage 1 | 17.1 | (0.28) | 17.1 | (0.62) | 17.7 | (0.65) | 17.0 | (0.37) |
| Hypertension stage 2 | 12.1 | (0.23) | 13.7 | (0.55) | 11.6 ** | (0.52) | 12.0 ** | (0.30) |
| Hypertensive crisis | 0.6 | (0.05) | 1.1 | (0.18) | 0.7 * | (0.13) | 0.4 *** | (0.06) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 9,944 | – | 2,110 | – | 1,901 | – | 5,326 | – |
| Normal | 49.6 | (0.50) | 46.2 | (1.11) | 49.8 * | (1.15) | 49.7 ** | (0.67) |
| Elevated | 17.7 | (0.40) | 18.2 | (0.93) | 18.1 | (0.94) | 17.6 | (0.54) |
| Hypertension stage 1 | 19.1 | (0.41) | 19.9 | (0.97) | 20.4 | (0.99) | 18.9 | (0.55) |
| Hypertension stage 2 | 13.1 | (0.34) | 14.4 | (0.84) | 11.3 ** | (0.75) | 13.4 | (0.46) |
| Hypertensive crisis | 0.5 | (0.07) | 1.4 | (0.29) | 0.4 ** | (0.14) | 0.4 ** | (0.08) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 9,980 | – | 2,393 | – | 1,893 | – | 5,128 | – |
| Normal | 59.8 | (0.45) | 57.4 | (0.97) | 59.0 | (1.05) | 60.5 ** | (0.63) |
| Elevated | 13.2 | (0.35) | 14.2 | (0.78) | 13.0 | (0.80) | 13.0 | (0.48) |
| Hypertension stage 1 | 15.1 | (0.37) | 14.4 | (0.78) | 15.2 | (0.86) | 15.2 | (0.50) |
| Hypertension stage 2 | 11.2 | (0.30) | 13.1 | (0.72) | 11.9 | (0.73) | 10.7 ** | (0.40) |
| Hypertensive crisis | 0.6 | (0.08) | 0.9 | (0.21) | 1.0 | (0.22) | 0.5 | (0.09) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Children 8–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 5,223 | – | 1,563 | – | 1,035 | – | 2,361 | – |
| Normal | 88.1 | (0.45) | 85.8 | (0.91) | 87.0 | (1.04) | 89.2 ** | (0.63) |
| Elevated | 7.6 | (0.37) | 9.0 | (0.76) | 8.2 | (0.84) | 7.0 * | (0.53) |
| Hypertension stage 1 | 4.0 | (0.27) | 4.8 | (0.56) | 4.4 | (0.64) | 3.5 * | (0.38) |
| Hypertension stage 2 | 0.3 | (0.08) | 0.3 | (0.16) | 0.4 | (0.20) | 0.3 | (0.11) |
| Hypertensive crisis | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 2,628 | – | 788 | – | 516 | – | 1,185 | – |
| Normal | 84.9 | (0.70) | 83.5 | (1.38) | 83.2 | (1.64) | 85.9 | (1.01) |
| Elevated | 9.8 | (0.59) | 12.1 | (1.22) | 10.8 | (1.35) | 8.9 * | (0.83) |
| Hypertension stage 1 | 4.7 | (0.41) | 3.8 | (0.72) | 5.3 | (0.99) | 4.6 | (0.61) |
| Hypertension stage 2 | 0.6 | (0.15) | 0.6 | (0.32) | 0.7 | (0.38) | 0.6 | (0.22) |
| Hypertensive crisis | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) |
| Girls | | | | | | | | |
| <i>Sample size</i> | 2,595 | – | 775 | – | 519 | – | 1,176 | – |
| Normal | 91.4 | (0.55) | 88.3 | (1.18) | 90.9 | (1.24) | 92.6 ** | (0.76) |
| Elevated | 5.3 | (0.44) | 5.8 | (0.88) | 5.5 | (0.99) | 5.1 | (0.64) |
| Hypertension stage 1 | 3.3 | (0.35) | 5.9 | (0.85) | 3.6 * | (0.80) | 2.3 *** | (0.43) |
| Hypertension stage 2 | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) |
| Hypertensive crisis | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) | 0.0 | (0.00) |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 10,037 | – | 2,156 | – | 1,930 | – | 5,385 | – |
| Normal | 55.0 | (0.48) | 51.5 | (1.03) | 55.6 ** | (1.10) | 55.2 ** | (0.65) |
| Elevated | 16.1 | (0.36) | 17.2 | (0.82) | 16.8 | (0.85) | 15.8 | (0.49) |
| Hypertension stage 1 | 18.7 | (0.38) | 18.5 | (0.84) | 18.7 | (0.90) | 18.9 | (0.52) |
| Hypertension stage 2 | 9.9 | (0.29) | 11.7 | (0.69) | 8.8 ** | (0.66) | 9.9 * | (0.39) |
| Hypertensive crisis | 0.3 | (0.05) | 1.0 | (0.22) | 0.1 *** | (0.08) | 0.2 *** | (0.06) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Men | | | | | | | | |
| <i>Sample size</i> | 5,003 | – | 978 | – | 978 | – | 2,744 | – |
| Normal | 45.9 | (0.70) | 41.1 | (1.55) | 46.2 * | (1.61) | 46.1 ** | (0.94) |
| Elevated | 19.3 | (0.56) | 20.1 | (1.28) | 20.3 | (1.31) | 19.0 | (0.75) |
| Hypertension stage 1 | 21.9 | (0.58) | 22.4 | (1.34) | 23.7 | (1.40) | 21.8 | (0.79) |
| Hypertension stage 2 | 12.4 | (0.46) | 14.7 | (1.11) | 9.6 *** | (0.98) | 12.8 | (0.62) |
| Hypertensive crisis | 0.5 | (0.09) | 1.6 | (0.40) | 0.1 *** | (0.13) | 0.2 *** | (0.09) |
| Women | | | | | | | | |
| <i>Sample size</i> | 5,034 | – | 1,178 | – | 952 | – | 2,641 | – |
| Normal | 64.0 | (0.65) | 61.8 | (1.35) | 64.9 | (1.51) | 64.2 | (0.89) |
| Elevated | 12.9 | (0.47) | 14.4 | (1.03) | 13.3 | (1.09) | 12.6 | (0.64) |
| Hypertension stage 1 | 15.5 | (0.50) | 14.7 | (1.03) | 13.8 | (1.13) | 16.0 | (0.69) |
| Hypertension stage 2 | 7.5 | (0.36) | 8.8 | (0.82) | 7.9 | (0.88) | 7.1 | (0.48) |
| Hypertensive crisis | 0.2 | (0.05) | 0.3 | (0.16) | 0.1 | (0.10) | 0.1 | (0.07) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,664 | – | 784 | – | 829 | – | 2,708 | – |
| Normal | 27.2 | (0.65) | 25.7 | (1.56) | 24.8 | (1.49) | 27.8 | (0.87) |
| Elevated | 19.6 | (0.59) | 18.5 | (1.39) | 17.4 | (1.33) | 20.3 | (0.78) |
| Hypertension stage 1 | 22.9 | (0.62) | 22.7 | (1.49) | 25.5 | (1.51) | 22.5 | (0.82) |
| Hypertension stage 2 | 28.4 | (0.66) | 30.6 | (1.64) | 29.4 | (1.56) | 27.8 | (0.87) |
| Hypertensive crisis | 1.9 | (0.20) | 2.5 | (0.56) | 2.9 | (0.59) | 1.5 | (0.24) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,313 | – | 344 | – | 407 | – | 1,397 | – |
| Normal | 29.0 | (0.95) | 28.5 | (2.43) | 30.7 | (2.30) | 28.3 | (1.22) |
| Elevated | 19.5 | (0.83) | 17.3 | (2.05) | 17.5 | (1.91) | 20.8 | (1.10) |
| Hypertension stage 1 | 23.2 | (0.89) | 26.4 | (2.38) | 23.3 | (2.10) | 22.5 | (1.14) |
| Hypertension stage 2 | 27.0 | (0.93) | 26.1 | (2.37) | 27.1 | (2.18) | 27.1 | (1.21) |
| Hypertensive crisis | 1.3 | (0.23) | 1.7 | (0.71) | 1.4 | (0.58) | 1.2 | (0.29) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|----------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,351 | – | 440 | – | 422 | – | 1,311 | – |
| Normal | 25.7 | (0.90) | 23.5 | (2.03) | 20.1 | (1.96) | 27.4 | (1.23) |
| Elevated | 19.7 | (0.82) | 19.5 | (1.88) | 17.2 | (1.84) | 20.0 | (1.10) |
| Hypertension stage 1 | 22.6 | (0.86) | 19.7 | (1.90) | 27.3 ** | (2.14) | 22.4 | (1.15) |
| Hypertension stage 2 | 29.6 | (0.92) | 34.2 | (2.26) | 31.3 | (2.20) | 28.4 * | (1.22) |
| Hypertensive crisis | 2.4 | (0.31) | 3.1 | (0.83) | 4.1 | (0.95) | 1.8 | (0.36) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For 8- to 12-year-old children, blood pressure categories are defined according to the National Heart, Lung, and Blood Institute’s pediatric guidelines. Children have elevated blood pressure if blood pressure for age-sex-height is $\geq 90^{\text{th}}$ percentile and $< 95^{\text{th}}$ percentile or 120/80 to 95th percentile (whichever is lower); hypertension stage 1 if blood pressure for age-sex-height is $\geq 95^{\text{th}}$ percentile to $< 95^{\text{th}}$ percentile +12 millimeters of mercury (mmHg), or 130/89 mmHg (whichever is lower); hypertension stage 2 if blood pressure for age-sex-height is $\geq 95^{\text{th}}$ percentile +12 mmHg, or 140/90 mmHg (whichever is lower). For children 13+ years old and adults, blood pressure categories are defined as follows: normal if systolic is < 120 mmHg and diastolic is < 80 mmHg, elevated if systolic is 120–129 mmHg and diastolic is < 80 mmHg, hypertension stage 1 if systolic is 130-139 mmHg and diastolic is 80-89 mmHg, hypertension stage 2 if systolic is 140+ mmHg and diastolic is 90+ mmHg, and hypertensive crisis if systolic is > 180 mmHg and diastolic is < 120 mmHg. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by $*p < .05$, $**p < .01$, or $***p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood pressure data. Sample includes NHANES respondents aged 8 and older with complete day 1 dietary recall data and blood pressure data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.6. High-Density Lipoprotein Status for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 6+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 19,768 | – | 4,558 | – | 3,754 | – | 10,309 | – |
| Normal | 67.9 | (0.34) | 60.1 | (0.78) | 64.6 *** | (0.81) | 70.2 *** | (0.46) |
| Lower than recommended | 32.1 | (0.34) | 39.9 | (0.78) | 35.4 *** | (0.81) | 29.8 *** | (0.46) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 9,885 | – | 2,136 | – | 1,885 | – | 5,271 | – |
| Normal | 68.2 | (0.49) | 62.6 | (1.15) | 66.5 * | (1.13) | 69.1 *** | (0.65) |
| Lower than recommended | 31.8 | (0.49) | 37.4 | (1.15) | 33.5 * | (1.13) | 30.9 *** | (0.65) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 9,883 | – | 2,422 | – | 1,869 | – | 5,038 | – |
| Normal | 67.5 | (0.48) | 57.7 | (1.06) | 62.8 *** | (1.16) | 71.3 *** | (0.65) |
| Lower than recommended | 32.5 | (0.48) | 42.3 | (1.06) | 37.2 *** | (1.16) | 28.7 *** | (0.65) |
| Children 6–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 5,492 | – | 1,731 | – | 1,072 | – | 2,419 | – |
| Normal | 72.6 | (0.60) | 70.6 | (1.12) | 72.9 | (1.35) | 73.2 | (0.89) |
| Borderline low | 15.8 | (0.49) | 15.6 | (0.90) | 15.8 | (1.12) | 16.1 | (0.75) |
| Lower than recommended | 11.6 | (0.43) | 13.8 | (0.86) | 11.2 * | (0.96) | 10.7 ** | (0.62) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 2,805 | – | 880 | – | 539 | – | 1,245 | – |
| Normal | 70.2 | (0.85) | 68.7 | (1.60) | 69.5 | (1.97) | 70.3 | (1.27) |
| Borderline low | 16.6 | (0.70) | 16.1 | (1.29) | 16.1 | (1.58) | 17.4 | (1.07) |
| Lower than recommended | 13.3 | (0.64) | 15.2 | (1.27) | 14.4 | (1.51) | 12.3 | (0.92) |
| Girls | | | | | | | | |
| <i>Sample size</i> | 2,687 | – | 851 | – | 533 | – | 1,174 | – |
| Normal | 75.1 | (0.83) | 72.6 | (1.55) | 76.5 | (1.84) | 76.3 | (1.24) |
| Borderline low | 15.0 | (0.69) | 15.0 | (1.24) | 15.6 | (1.58) | 14.7 | (1.04) |
| Lower than recommended | 9.9 | (0.58) | 12.3 | (1.15) | 7.9 ** | (1.17) | 9.1 * | (0.83) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 9,782 | – | 2,088 | – | 1,888 | – | 5,250 | – |
| Normal | 64.9 | (0.48) | 55.8 | (1.09) | 61.3 *** | (1.14) | 68.0 *** | (0.65) |
| Lower than recommended | 35.1 | (0.48) | 44.2 | (1.09) | 38.7 *** | (1.14) | 32.0 *** | (0.65) |
| Men | | | | | | | | |
| <i>Sample size</i> | 4,849 | – | 932 | – | 957 | – | 2,666 | – |
| Normal | 66.7 | (0.68) | 60.5 | (1.60) | 64.3 | (1.58) | 67.7 *** | (0.91) |
| Lower than recommended | 33.3 | (0.68) | 39.5 | (1.60) | 35.7 | (1.58) | 32.3 *** | (0.91) |
| Women | | | | | | | | |
| <i>Sample size</i> | 4,933 | – | 1,156 | – | 931 | – | 2,584 | – |
| Normal | 63.2 | (0.69) | 51.2 | (1.47) | 58.3 ** | (1.63) | 68.3 *** | (0.93) |
| Lower than recommended | 36.8 | (0.69) | 48.8 | (1.47) | 41.7 ** | (1.63) | 31.7 *** | (0.93) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,494 | – | 739 | – | 794 | – | 2,640 | – |
| Normal | 72.2 | (0.67) | 62.9 | (1.78) | 67.0 | (1.68) | 74.4 *** | (0.86) |
| Lower than recommended | 27.8 | (0.67) | 37.1 | (1.78) | 33.0 | (1.68) | 25.6 *** | (0.86) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,231 | – | 324 | – | 389 | – | 1,360 | – |
| Normal | 71.5 | (0.97) | 62.9 | (2.67) | 70.7 * | (2.31) | 72.7 *** | (1.23) |
| Lower than recommended | 28.5 | (0.97) | 37.1 | (2.67) | 29.3 * | (2.31) | 27.3 *** | (1.23) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,263 | – | 415 | – | 405 | – | 1,280 | – |
| Normal | 72.8 | (0.94) | 62.8 | (2.39) | 64.0 | (2.39) | 75.7 *** | (1.20) |
| Lower than recommended | 27.2 | (0.94) | 37.2 | (2.39) | 36.0 | (2.39) | 24.3 *** | (1.20) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For individuals younger than 20, high-density lipoprotein (HDL) levels are defined as follows: normal if HDL is > 45 mg/dL, borderline low if HDL 40–45 mg/dL, and lower than recommended if HDL is < 40 mg/dL. For men aged 20 and older, HDL levels are defined as follows: normal if HDL is > 40 mg/dL, and lower than recommended if HDL is ≤ 40 mg/dL. For women aged 20 and older, HDL levels are defined as follows: normal if HDL is > 50 mg/dL, and lower than recommended if HDL is ≤ 50 mg/dL. In the “All individuals” section, “lower than recommended” includes both “borderline low” and “lower than recommended” categories for children. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents aged 6 and older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.7. Low-Density Lipoprotein Category for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 12+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 8,031 | – | 1,631 | – | 1,626 | – | 4,269 | – |
| Normal | 42.8 | (0.53) | 43.8 | (1.22) | 42.3 | (1.19) | 42.9 | (0.73) |
| Higher than recommended | 57.2 | (0.53) | 56.2 | (1.22) | 57.7 | (1.19) | 57.1 | (0.73) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 3,984 | – | 731 | – | 822 | – | 2,174 | – |
| Normal | 42.8 | (0.75) | 46.1 | (1.88) | 40.7 * | (1.65) | 42.9 | (1.02) |
| Higher than recommended | 57.2 | (0.75) | 53.9 | (1.88) | 59.3 * | (1.65) | 57.1 | (1.02) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 4,047 | – | 900 | – | 804 | – | 2,095 | – |
| Normal | 42.9 | (0.75) | 41.5 | (1.59) | 43.9 | (1.71) | 42.8 | (1.05) |
| Higher than recommended | 57.1 | (0.75) | 58.5 | (1.59) | 56.1 | (1.71) | 57.2 | (1.05) |
| Children 12–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 1,359 | – | 387 | – | 309 | – | 582 | – |
| Normal | 82.4 | (1.03) | 79.1 | (2.05) | 83.0 | (2.20) | 83.4 | (1.56) |
| Borderline high | 12.4 | (0.90) | 16.7 | (1.89) | 7.5 *** | (1.50) | 12.4 | (1.38) |
| Higher than recommended | 5.2 | (0.60) | 4.2 | (0.99) | 9.5 ** | (1.73) | 4.2 | (0.85) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 688 | – | 204 | – | 168 | – | 276 | – |
| Normal | 82.7 | (1.44) | 81.3 | (2.69) | 85.3 | (2.84) | 81.8 | (2.36) |
| Borderline high | 11.8 | (1.23) | 14.8 | (2.50) | 7.5 * | (2.08) | 12.8 | (2.05) |
| Higher than recommended | 5.5 | (0.87) | 3.9 | (1.25) | 7.2 | (2.11) | 5.4 | (1.38) |
| Girls | | | | | | | | |
| <i>Sample size</i> | 671 | – | 183 | – | 141 | – | 306 | – |
| Normal | 82.1 | (1.48) | 76.8 | (3.12) | 80.6 | (3.39) | 85.1 * | (2.03) |
| Borderline high | 13.1 | (1.30) | 18.6 | (2.85) | 7.5 ** | (2.18) | 11.9 * | (1.85) |
| Higher than recommended | 4.8 | (0.82) | 4.6 | (1.55) | 11.9 * | (2.76) | 3.0 | (0.96) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,515 | – | 939 | – | 931 | – | 2,388 | – |
| Normal | 36.4 | (0.69) | 38.3 | (1.55) | 36.4 | (1.54) | 36.3 | (0.97) |
| Higher than recommended | 63.6 | (0.69) | 61.7 | (1.55) | 63.6 | (1.54) | 63.7 | (0.97) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,223 | – | 401 | – | 465 | – | 1,224 | – |
| Normal | 33.9 | (0.98) | 38.0 | (2.37) | 32.4 | (2.12) | 34.2 | (1.32) |
| Higher than recommended | 66.1 | (0.98) | 62.0 | (2.37) | 67.6 | (2.12) | 65.8 | (1.32) |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,292 | – | 538 | – | 466 | – | 1,164 | – |
| Normal | 38.9 | (0.99) | 38.7 | (1.99) | 40.3 | (2.23) | 38.5 | (1.41) |
| Higher than recommended | 61.1 | (0.99) | 61.3 | (1.99) | 59.7 | (2.23) | 61.5 | (1.41) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 2,157 | – | 305 | – | 386 | – | 1,299 | – |
| Normal | 41.6 | (1.05) | 41.7 | (2.81) | 39.1 | (2.47) | 41.5 | (1.36) |
| Higher than recommended | 58.4 | (1.05) | 58.3 | (2.81) | 60.9 | (2.47) | 58.5 | (1.36) |
| Men | | | | | | | | |
| <i>Sample size</i> | 1,073 | – | 126 | – | 189 | – | 674 | – |
| Normal | 48.8 | (1.52) | 52.4 | (4.51) | 41.9 | (3.61) | 49.1 | (1.91) |
| Higher than recommended | 51.2 | (1.52) | 47.6 | (4.51) | 58.1 | (3.61) | 50.9 | (1.91) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Women | | | | | | | | |
| <i>Sample size</i> | 1,084 | – | 179 | – | 197 | – | 625 | – |
| Normal | 35.9 | (1.46) | 33.1 | (3.54) | 36.8 | (3.38) | 35.4 | (1.92) |
| Higher than recommended | 64.1 | (1.46) | 66.9 | (3.54) | 63.2 | (3.38) | 64.6 | (1.92) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For individuals younger than 19, Low-density lipoprotein (LDL) levels are defined as normal if LDL < 110 mg/dL, borderline high if LDL 110–129 mg/dL, and higher than recommended if LDL > 130 mg/dL. For adults 19 and older, LDL levels are defined as normal if LDL is < 100 mg/dL, and higher than recommended if LDL is ≥ 100 mg/dL. In the “All individuals” section, “higher than recommended” includes both “borderline high” and “higher than recommended” categories for children. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents aged 12 and older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.8. Triglyceride Concentrations for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 12+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 8,131 | – | 1,654 | – | 1,645 | – | 4,321 | – |
| Normal | 75.7 | (0.48) | 73.1 | (1.12) | 73.6 | (1.12) | 77.0 ** | (0.64) |
| Borderline high | 12.7 | (0.37) | 15.2 | (0.92) | 13.1 | (0.86) | 12.0 ** | (0.50) |
| High | 11.6 | (0.36) | 11.7 | (0.81) | 13.3 | (0.87) | 11.0 | (0.48) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 4,056 | – | 747 | – | 834 | – | 2,214 | – |
| Normal | 71.7 | (0.72) | 71.2 | (1.71) | 69.6 | (1.66) | 72.4 | (0.97) |
| Borderline high | 13.1 | (0.54) | 14.7 | (1.35) | 13.9 | (1.25) | 12.5 | (0.72) |
| High | 15.2 | (0.58) | 14.1 | (1.31) | 16.5 | (1.35) | 15.1 | (0.79) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 4,075 | – | 907 | – | 811 | – | 2,107 | – |
| Normal | 79.4 | (0.63) | 74.8 | (1.46) | 77.3 | (1.51) | 81.4 *** | (0.84) |
| Borderline high | 12.4 | (0.51) | 15.7 | (1.24) | 12.4 | (1.19) | 11.5 ** | (0.69) |
| High | 8.2 | (0.43) | 9.4 | (0.98) | 10.3 | (1.11) | 7.2 * | (0.56) |
| Children 12–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 1,362 | – | 388 | – | 309 | – | 583 | – |
| Normal | 75.2 | (1.17) | 68.3 | (2.36) | 73.3 | (2.55) | 79.0 *** | (1.70) |
| Borderline high | 15.1 | (0.97) | 18.9 | (2.01) | 14.4 | (2.06) | 14.0 * | (1.44) |
| High | 9.7 | (0.80) | 12.8 | (1.68) | 12.3 | (1.83) | 7.0 ** | (1.08) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 690 | – | 205 | – | 168 | – | 277 | – |
| Normal | 73.4 | (1.69) | 66.4 | (3.34) | 70.3 | (3.61) | 76.8 * | (2.57) |
| Borderline high | 14.5 | (1.34) | 19.0 | (2.79) | 12.3 | (2.61) | 13.8 | (2.11) |
| High | 12.1 | (1.24) | 14.6 | (2.47) | 17.4 | (2.98) | 9.3 | (1.76) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Girls | | | | | | | | |
| <i>Sample size</i> | 672 | – | 183 | – | 141 | – | 306 | – |
| Normal | 77.2 | (1.61) | 70.3 | (3.32) | 76.3 | (3.60) | 81.3 ** | (2.21) |
| Borderline high | 15.7 | (1.40) | 18.8 | (2.89) | 16.7 | (3.20) | 14.1 | (1.97) |
| High | 7.1 | (0.99) | 10.9 | (2.25) | 6.9 | (2.07) | 4.7 * | (1.21) |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,591 | – | 960 | – | 945 | – | 2,426 | – |
| Normal | 76.1 | (0.62) | 73.8 | (1.40) | 74.3 | (1.43) | 77.3 * | (0.83) |
| Borderline high | 11.5 | (0.47) | 13.9 | (1.13) | 12.6 | (1.10) | 10.6 ** | (0.62) |
| High | 12.4 | (0.48) | 12.4 | (1.05) | 13.0 | (1.12) | 12.1 | (0.64) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,278 | – | 415 | – | 476 | – | 1,252 | – |
| Normal | 70.2 | (0.95) | 69.8 | (2.19) | 68.4 | (2.16) | 70.5 | (1.27) |
| Borderline high | 12.8 | (0.70) | 14.5 | (1.73) | 14.2 | (1.62) | 12.1 | (0.92) |
| High | 17.0 | (0.78) | 15.7 | (1.72) | 17.4 | (1.78) | 17.4 | (1.05) |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,313 | – | 545 | – | 469 | – | 1,174 | – |
| Normal | 81.9 | (0.79) | 77.7 | (1.76) | 80.2 | (1.89) | 84.0 ** | (1.06) |
| Borderline high | 10.2 | (0.63) | 13.3 | (1.47) | 11.1 | (1.49) | 9.0 * | (0.83) |
| High | 7.8 | (0.55) | 9.0 | (1.20) | 8.7 | (1.35) | 6.9 | (0.73) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 2,178 | – | 306 | – | 391 | – | 1,312 | – |
| Normal | 74.5 | (0.94) | 73.4 | (2.52) | 71.4 | (2.31) | 74.9 | (1.22) |
| Borderline high | 15.1 | (0.78) | 17.3 | (2.12) | 13.8 | (1.77) | 15.3 | (1.02) |
| High | 10.4 | (0.66) | 9.3 | (1.70) | 14.8 * | (1.82) | 9.8 | (0.83) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Men | | | | | | | | |
| <i>Sample size</i> | 1,088 | – | 127 | – | 190 | – | 685 | – |
| Normal | 75.8 | (1.31) | 78.9 | (3.67) | 73.3 | (3.21) | 75.9 | (1.66) |
| Borderline high | 13.0 | (1.03) | 12.8 | (2.89) | 13.7 | (2.51) | 13.1 | (1.31) |
| High | 11.1 | (0.97) | 8.4 | (2.55) | 13.0 | (2.42) | 11.0 | (1.22) |
| Women | | | | | | | | |
| <i>Sample size</i> | 1,090 | – | 197 | – | 201 | – | 627 | – |
| Normal | 73.5 | (1.34) | 69.0 | (3.47) | 69.8 | (3.27) | 74.1 | (1.75) |
| Borderline high | 16.8 | (1.13) | 21.0 | (3.04) | 14.0 | (2.47) | 17.1 | (1.51) |
| High | 9.7 | (0.90) | 10.0 | (2.27) | 16.2 | (2.64) | 8.9 | (1.13) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For individuals 12+ years old, triglyceride (TG) levels are defined as follows: normal if TG is < 150 mg/dL, borderline high if TG is 150–199 mg/dL, and high if TG is ≥ 200 mg/dL. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents aged 12 and older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.9. Blood Glucose Status for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 12+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 8,383 | – | 1,721 | – | 1,699 | – | 4,435 | – |
| Normal | 54.2 | (0.52) | 53.3 | (1.18) | 50.5 | (1.15) | 55.0 | (0.72) |
| Prediabetes | 36.6 | (0.52) | 33.4 | (1.19) | 37.3 * | (1.17) | 37.0 ** | (0.72) |
| Diabetes | 9.3 | (0.30) | 13.3 | (0.84) | 12.1 | (0.80) | 7.9 *** | (0.38) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 4,174 | – | 782 | – | 856 | – | 2,268 | – |
| Normal | 46.4 | (0.77) | 50.0 | (1.78) | 41.8 *** | (1.66) | 45.9 * | (1.05) |
| Prediabetes | 42.8 | (0.78) | 34.9 | (1.81) | 44.2 *** | (1.74) | 44.6 *** | (1.07) |
| Diabetes | 10.8 | (0.45) | 15.1 | (1.30) | 14.0 | (1.19) | 9.5 *** | (0.56) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 4,209 | – | 939 | – | 843 | – | 2,167 | – |
| Normal | 61.5 | (0.72) | 56.5 | (1.57) | 58.8 | (1.60) | 63.7 *** | (0.98) |
| Prediabetes | 30.7 | (0.70) | 31.9 | (1.55) | 30.8 | (1.58) | 29.8 | (0.96) |
| Diabetes | 7.8 | (0.41) | 11.6 | (1.09) | 10.4 | (1.07) | 6.5 *** | (0.50) |
| Children 12–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 1,414 | – | 402 | – | 324 | – | 604 | – |
| Normal | 77.7 | (1.08) | 82.4 | (1.87) | 72.1 *** | (2.44) | 77.6 | (1.69) |
| Prediabetes | 21.2 | (1.07) | 17.2 | (1.85) | 26.7 ** | (2.42) | 21.1 | (1.66) |
| Diabetes | 1.1 | (0.27) | 0.4 | (0.32) | 1.2 | (0.57) | 1.3 | (0.46) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 710 | – | 211 | – | 172 | – | 286 | – |
| Normal | 69.4 | (1.73) | 74.6 | (3.04) | 60.7 ** | (3.80) | 69.8 | (2.73) |
| Prediabetes | 28.7 | (1.70) | 25.0 | (3.02) | 37.5 ** | (3.76) | 27.7 | (2.67) |
| Diabetes | 1.9 | (0.51) | 0.5 | (0.50) | 1.8 | (0.96) | 2.5 * | (0.88) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Girls | | | | | | | | |
| <i>Sample size</i> | 704 | – | 191 | – | 152 | – | 318 | – |
| Normal | 86.5 | (1.28) | 90.6 | (2.11) | 84.1 | (3.02) | 85.9 | (1.94) |
| Prediabetes | 13.3 | (1.27) | 9.1 | (2.08) | 15.4 | (2.98) | 14.0 | (1.94) |
| Diabetes | 0.2 | (0.17) | 0.3 | (0.40) | 0.5 | (0.57) | 0.1 | (0.17) |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,703 | – | 993 | – | 966 | – | 2,478 | – |
| Normal | 57.4 | (0.69) | 56.5 | (1.55) | 55.0 | (1.52) | 58.3 | (0.95) |
| Prediabetes | 35.8 | (0.68) | 33.4 | (1.51) | 35.5 | (1.50) | 36.2 | (0.93) |
| Diabetes | 6.9 | (0.36) | 10.1 | (0.95) | 9.5 | (0.96) | 5.6 *** | (0.44) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,330 | – | 433 | – | 484 | – | 1,274 | – |
| Normal | 48.7 | (1.01) | 54.4 | (2.36) | 44.2 ** | (2.19) | 47.6 * | (1.38) |
| Prediabetes | 43.5 | (1.02) | 34.5 | (2.29) | 44.5 ** | (2.24) | 45.8 *** | (1.39) |
| Diabetes | 7.9 | (0.54) | 11.0 | (1.46) | 11.3 | (1.45) | 6.6 ** | (0.66) |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,373 | – | 560 | – | 482 | – | 1,204 | – |
| Normal | 66.0 | (0.94) | 58.6 | (2.01) | 65.7 * | (2.11) | 68.8 *** | (1.29) |
| Prediabetes | 28.1 | (0.91) | 32.2 | (1.96) | 26.6 * | (2.01) | 26.6 * | (1.25) |
| Diabetes | 5.8 | (0.47) | 9.2 | (1.22) | 7.7 | (1.26) | 4.6 *** | (0.58) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 2,266 | – | 326 | – | 409 | – | 1,353 | – |
| Normal | 32.1 | (0.99) | 28.6 | (2.46) | 25.6 | (2.16) | 33.4 | (1.30) |
| Prediabetes | 47.1 | (1.06) | 41.8 | (2.74) | 48.5 | (2.50) | 48.0 * | (1.38) |
| Diabetes | 20.8 | (0.85) | 29.6 | (2.53) | 25.8 | (2.17) | 18.6 *** | (1.05) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Men | | | | | | | | |
| <i>Sample size</i> | 1,134 | – | 138 | – | 200 | – | 708 | – |
| Normal | 25.0 | (1.30) | 20.3 | (3.44) | 22.3 | (2.88) | 26.0 | (1.68) |
| Prediabetes | 49.1 | (1.50) | 42.2 | (4.25) | 47.3 | (3.55) | 50.5 | (1.90) |
| Diabetes | 25.9 | (1.31) | 37.5 | (4.15) | 30.4 | (3.29) | 23.5 ** | (1.60) |
| Women | | | | | | | | |
| <i>Sample size</i> | 1,132 | – | 188 | – | 209 | – | 645 | – |
| Normal | 37.8 | (1.44) | 35.2 | (3.47) | 28.4 | (3.15) | 39.4 | (1.92) |
| Prediabetes | 45.5 | (1.48) | 41.5 | (3.57) | 49.5 | (3.49) | 45.9 | (1.96) |
| Diabetes | 16.7 | (1.11) | 23.3 | (3.10) | 22.1 | (2.89) | 14.7 * | (1.39) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. Fasting plasma glucose levels are defined as follows: normal if < 100 mg/dL, prediabetes if 100–125 mg/dL, and diabetes if > 125 mg/dL. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents aged 12 and older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.10. Hemoglobin Status for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 1+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 22,079 | – | 5,492 | – | 4,178 | – | 11,171 | – |
| Normal | 93.2 | (0.17) | 88.8 | (0.47) | 91.7 *** | (0.44) | 94.7 *** | (0.21) |
| Low | 6.8 | (0.17) | 11.2 | (0.47) | 8.3 *** | (0.44) | 5.3 *** | (0.21) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 11,063 | – | 2,604 | – | 2,108 | – | 5,718 | – |
| Normal | 96.0 | (0.18) | 92.4 | (0.58) | 95.8 *** | (0.45) | 96.7 *** | (0.22) |
| Low | 4.0 | (0.18) | 7.6 | (0.58) | 4.2 *** | (0.45) | 3.3 *** | (0.22) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 11,016 | – | 2,888 | – | 2,070 | – | 5,453 | – |
| Normal | 90.6 | (0.29) | 85.3 | (0.74) | 87.8 * | (0.75) | 92.8 *** | (0.36) |
| Low | 9.4 | (0.29) | 14.7 | (0.74) | 12.2 * | (0.75) | 7.2 *** | (0.36) |
| Children 1–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 7,625 | – | 2,625 | – | 1,448 | – | 3,199 | – |
| Normal | 95.5 | (0.23) | 93.2 | (0.50) | 95.4 ** | (0.52) | 96.8 *** | (0.31) |
| Low | 4.5 | (0.23) | 6.8 | (0.50) | 4.6 ** | (0.52) | 3.2 *** | (0.31) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 3,905 | – | 1,333 | – | 739 | – | 1,655 | – |
| Normal | 97.3 | (0.26) | 96.1 | (0.53) | 98.5 *** | (0.46) | 97.7 * | (0.38) |
| Low | 2.7 | (0.26) | 3.9 | (0.53) | 1.5 *** | (0.46) | 2.3 * | (0.38) |
| Girls | | | | | | | | |
| <i>Sample size</i> | 3,720 | – | 1,292 | – | 709 | – | 1,544 | – |
| Normal | 93.6 | (0.40) | 90.3 | (0.86) | 92.3 | (0.96) | 95.8 *** | (0.49) |
| Low | 6.4 | (0.40) | 9.7 | (0.86) | 7.7 | (0.96) | 4.2 *** | (0.49) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 9,877 | – | 2,107 | – | 1,917 | – | 5,294 | – |
| Normal | 93.4 | (0.25) | 89.3 | (0.66) | 91.4 * | (0.65) | 94.9 *** | (0.30) |
| Low | 6.6 | (0.25) | 10.7 | (0.66) | 8.6 * | (0.65) | 5.1 *** | (0.30) |
| Men | | | | | | | | |
| <i>Sample size</i> | 4,894 | – | 944 | – | 972 | – | 2,682 | – |
| Normal | 97.4 | (0.23) | 93.9 | (0.75) | 96.8 ** | (0.59) | 98.2 *** | (0.25) |
| Low | 2.6 | (0.23) | 6.1 | (0.75) | 3.2 ** | (0.59) | 1.8 *** | (0.25) |
| Women | | | | | | | | |
| <i>Sample size</i> | 4,983 | – | 1,163 | – | 945 | – | 2,612 | – |
| Normal | 89.4 | (0.44) | 84.7 | (1.07) | 86.1 | (1.15) | 91.7 *** | (0.55) |
| Low | 10.6 | (0.44) | 15.3 | (1.07) | 13.9 | (1.15) | 8.3 *** | (0.55) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,577 | – | 760 | – | 813 | – | 2,678 | – |
| Normal | 89.8 | (0.44) | 81.5 | (1.42) | 87.8 *** | (1.12) | 91.6 *** | (0.52) |
| Low | 10.2 | (0.44) | 18.5 | (1.42) | 12.2 *** | (1.12) | 8.4 *** | (0.52) |
| Men | | | | | | | | |
| <i>Sample size</i> | 2,264 | – | 327 | – | 397 | – | 1,381 | – |
| Normal | 89.2 | (0.62) | 81.8 | (2.13) | 88.3 * | (1.57) | 90.3 *** | (0.74) |
| Low | 10.8 | (0.62) | 18.2 | (2.13) | 11.7 * | (1.57) | 9.7 *** | (0.74) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Women | | | | | | | | |
| <i>Sample size</i> | 2,313 | – | 433 | – | 416 | – | 1,297 | – |
| Normal | 90.2 | (0.61) | 81.3 | (1.90) | 87.5 * | (1.58) | 92.6 *** | (0.72) |
| Low | 9.8 | (0.61) | 18.7 | (1.90) | 12.5 * | (1.58) | 7.4 *** | (0.72) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For children 6–59 months old, hemoglobin levels are defined as: normal if ≥ 110 grams per liter (g/L) and low if < 110 g/L. For children 5–11 years old, hemoglobin levels are defined as follows: normal if ≥ 115 g/L and low if < 115 g/L. For children 12–14 years old, hemoglobin levels are defined as: normal if ≥ 120 g/L and low if < 120 g/L. For nonpregnant women 15 years old or older, hemoglobin levels are defined as: normal if ≥ 120 g/L and low if < 120 g/L. For men 15 years old or older, hemoglobin levels are defined as: normal if ≥ 130 g/L and low if < 130 g/L. The above reference levels were used for the nonsmoking population residing at sea level. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents 1 year old or older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.11. Vitamin B12 Status for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All Adults | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 9,259 | – | 1,781 | – | 1,794 | – | 5,172 | – |
| Adequate | 98.3 | (0.13) | 98.1 | (0.33) | 98.2 | (0.31) | 98.3 | (0.18) |
| Inadequate | 1.7 | (0.13) | 1.9 | (0.33) | 1.8 | (0.31) | 1.7 | (0.18) |
| Men | | | | | | | | |
| <i>Sample size</i> | 4,603 | – | 795 | – | 896 | – | 2,648 | – |
| Adequate | 98.5 | (0.17) | 98.7 | (0.40) | 97.7 | (0.50) | 98.5 | (0.23) |
| Inadequate | 1.5 | (0.17) | 1.3 | (0.40) | 2.3 | (0.50) | 1.5 | (0.23) |
| Women | | | | | | | | |
| <i>Sample size</i> | 4,656 | – | 986 | – | 898 | – | 2,524 | – |
| Adequate | 98.1 | (0.20) | 97.5 | (0.51) | 98.7 | (0.39) | 98.1 | (0.27) |
| Inadequate | 1.9 | (0.20) | 2.5 | (0.51) | 1.3 | (0.39) | 1.9 | (0.27) |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 6,384 | – | 1,355 | – | 1,257 | – | 3,430 | – |
| Adequate | 98.6 | (0.15) | 98.6 | (0.32) | 98.6 | (0.35) | 98.6 | (0.20) |
| Inadequate | 1.4 | (0.15) | 1.4 | (0.32) | 1.4 | (0.35) | 1.4 | (0.20) |
| Men | | | | | | | | |
| <i>Sample size</i> | 3,175 | – | 615 | – | 640 | – | 1,744 | – |
| Adequate | 99.1 | (0.17) | 99.0 | (0.41) | 98.7 | (0.48) | 99.0 | (0.24) |
| Inadequate | 0.9 | (0.17) | 1.0 | (0.41) | 1.3 | (0.48) | 1.0 | (0.24) |
| Women | | | | | | | | |
| <i>Sample size</i> | 3,209 | – | 740 | – | 617 | – | 1,686 | – |
| Adequate | 98.2 | (0.24) | 98.2 | (0.49) | 98.5 | (0.51) | 98.3 | (0.31) |
| Inadequate | 1.8 | (0.24) | 1.8 | (0.49) | 1.5 | (0.51) | 1.7 | (0.31) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 2,875 | – | 426 | – | 537 | – | 1,742 | – |
| Adequate | 97.2 | (0.30) | 96.5 | (0.89) | 97.1 | (0.70) | 97.2 | (0.39) |
| Inadequate | 2.8 | (0.30) | 3.5 | (0.89) | 2.9 | (0.70) | 2.8 | (0.39) |
| Men | | | | | | | | |
| <i>Sample size</i> | 1,428 | – | 180 | – | 256 | – | 904 | – |
| Adequate | 96.5 | (0.48) | 97.6 | (1.08) | 94.3 | (1.45) | 96.7 | (0.59) |
| Inadequate | 3.5 | (0.48) | 2.4 | (1.08) | 5.7 | (1.45) | 3.3 | (0.59) |
| Women | | | | | | | | |
| <i>Sample size</i> | 1,447 | – | 246 | – | 281 | – | 838 | – |
| Adequate | 97.8 | (0.39) | 95.5 | (1.35) | 99.3 ** | (0.49) | 97.7 | (0.52) |
| Inadequate | 2.2 | (0.39) | 4.5 | (1.35) | 0.7 ** | (0.49) | 2.3 | (0.52) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For adults 19+ years old, serum B12 levels are defined as follows: normal if ≥ 200 picogram per milliliter (pg/mL) and low if < 200 pg/mL. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents aged 19 and older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.

Table C.12. Serum Vitamin D Status for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 1+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 14,527 | – | 3,626 | – | 2,851 | – | 7,320 | – |
| Adequate | 76.9 | (0.36) | 65.2 | (0.89) | 71.1 *** | (0.88) | 81.5 *** | (0.46) |
| Inadequate | 18.2 | (0.33) | 26.4 | (0.83) | 22.0 *** | (0.80) | 15.0 *** | (0.43) |
| Associated with deficiency | 4.9 | (0.19) | 8.4 | (0.54) | 6.9 * | (0.51) | 3.4 *** | (0.22) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 7,291 | – | 1,735 | – | 1,430 | – | 3,749 | – |
| Adequate | 77.0 | (0.51) | 65.0 | (1.32) | 70.7 ** | (1.26) | 81.5 *** | (0.65) |
| Inadequate | 18.7 | (0.48) | 27.4 | (1.25) | 23.3 * | (1.18) | 15.6 *** | (0.61) |
| Associated with deficiency | 4.3 | (0.26) | 7.6 | (0.76) | 6.0 | (0.68) | 2.9 *** | (0.29) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 7,236 | – | 1,891 | – | 1,421 | – | 3,571 | – |
| Adequate | 76.7 | (0.51) | 65.4 | (1.20) | 71.6 *** | (1.22) | 81.6 *** | (0.66) |
| Inadequate | 17.8 | (0.46) | 25.4 | (1.10) | 20.7 ** | (1.10) | 14.5 *** | (0.60) |
| Associated with deficiency | 5.5 | (0.28) | 9.2 | (0.75) | 7.7 | (0.76) | 4.0 *** | (0.34) |
| Children 1–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 4,987 | – | 1,770 | – | 985 | – | 2,025 | – |
| Adequate | 83.1 | (0.52) | 75.2 | (1.04) | 78.3 | (1.25) | 88.4 *** | (0.68) |
| Inadequate | 14.5 | (0.49) | 20.7 | (1.00) | 19.1 | (1.21) | 10.0 *** | (0.64) |
| Associated with deficiency | 2.5 | (0.22) | 4.0 | (0.51) | 2.6 * | (0.48) | 1.6 *** | (0.26) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 2,555 | – | 912 | – | 498 | – | 1,037 | – |
| Adequate | 84.7 | (0.70) | 77.5 | (1.43) | 80.7 | (1.74) | 89.5 *** | (0.89) |
| Inadequate | 13.1 | (0.66) | 18.9 | (1.36) | 17.7 | (1.69) | 9.0 *** | (0.84) |
| Associated with deficiency | 2.1 | (0.29) | 3.5 | (0.67) | 1.6 * | (0.55) | 1.4 ** | (0.35) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Girls | | | | | | | | |
| <i>Sample size</i> | 2,432 | – | 858 | – | 487 | – | 988 | – |
| Adequate | 81.3 | (0.77) | 72.8 | (1.53) | 75.8 | (1.81) | 87.2 *** | (1.04) |
| Inadequate | 15.9 | (0.73) | 22.6 | (1.47) | 20.5 | (1.74) | 11.1 *** | (0.98) |
| Associated with deficiency | 2.8 | (0.33) | 4.6 | (0.77) | 3.7 | (0.80) | 1.8 ** | (0.39) |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 6,621 | – | 1,417 | – | 1,324 | – | 3,528 | – |
| Adequate | 71.4 | (0.56) | 57.9 | (1.32) | 64.9 *** | (1.33) | 76.6 *** | (0.72) |
| Inadequate | 22.0 | (0.51) | 31.0 | (1.24) | 25.6 ** | (1.21) | 18.7 *** | (0.66) |
| Associated with deficiency | 6.6 | (0.31) | 11.1 | (0.84) | 9.5 | (0.82) | 4.8 *** | (0.36) |
| Men | | | | | | | | |
| <i>Sample size</i> | 3,293 | – | 639 | – | 674 | – | 1,799 | – |
| Adequate | 70.8 | (0.79) | 57.0 | (1.97) | 63.5 * | (1.90) | 75.8 *** | (1.01) |
| Inadequate | 23.3 | (0.74) | 32.0 | (1.85) | 27.9 | (1.77) | 20.3 *** | (0.95) |
| Associated with deficiency | 5.9 | (0.41) | 11.0 | (1.25) | 8.6 | (1.10) | 3.9 *** | (0.46) |
| Women | | | | | | | | |
| <i>Sample size</i> | 3,328 | – | 778 | – | 650 | – | 1,729 | – |
| Adequate | 72.0 | (0.78) | 58.7 | (1.78) | 66.3 ** | (1.86) | 77.3 *** | (1.02) |
| Inadequate | 20.7 | (0.70) | 30.1 | (1.66) | 23.2 ** | (1.66) | 17.1 *** | (0.92) |
| Associated with deficiency | 7.3 | (0.45) | 11.2 | (1.13) | 10.5 | (1.22) | 5.6 *** | (0.56) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 3,328 | – | 778 | – | 650 | – | 1,729 | – |
| Adequate | 85.5 | (0.66) | 74.3 | (2.12) | 80.6 * | (1.71) | 87.7 *** | (0.80) |
| Inadequate | 11.8 | (0.60) | 19.7 | (1.93) | 14.9 | (1.55) | 10.5 *** | (0.75) |
| Associated with deficiency | 2.7 | (0.31) | 6.0 | (1.11) | 4.4 | (0.90) | 1.7 *** | (0.32) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|----------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Men | | | | | | | | |
| <i>Sample size</i> | 1,443 | – | 184 | – | 258 | – | 913 | – |
| Adequate | 86.6 | (0.91) | 73.1 | (3.35) | 79.9 | (2.54) | 88.7 *** | (1.08) |
| Inadequate | 11.5 | (0.85) | 24.5 | (3.26) | 16.0 * | (2.33) | 9.9 *** | (1.01) |
| Associated with deficiency | 1.9 | (0.37) | 2.4 | (1.14) | 4.1 | (1.27) | 1.4 | (0.42) |
| Women | | | | | | | | |
| <i>Sample size</i> | 1,476 | – | 255 | – | 284 | – | 854 | – |
| Adequate | 84.6 | (0.94) | 75.3 | (2.72) | 81.2 | (2.31) | 86.9 *** | (1.15) |
| Inadequate | 12.1 | (0.85) | 15.8 | (2.31) | 14.0 | (2.07) | 11.1 | (1.07) |
| Associated with deficiency | 3.3 | (0.47) | 8.9 | (1.78) | 4.7 | (1.26) | 2.0 *** | (0.48) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For both children and adults, serum 25-hydroxyvitamin D levels are defined as follows: adequate if ≥ 50 and < 125 nanomoles per liter (nmol/L), inadequate if ≥ 30 to < 50 nmol/L, and associated with deficiency if < 30 nmol/L. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents aged 1 and older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data

Table C.13. Iodine Status for SNAP Participants and Nonparticipants by Age Group and Gender

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-------------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| All individuals 6+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 6,961 | – | 1,573 | – | 1,304 | – | 3,657 | – |
| Adequate | 61.9 | (0.60) | 65.7 | (1.32) | 62.3 | (1.40) | 60.3 *** | (0.82) |
| Inadequate | 38.1 | (0.60) | 34.3 | (1.32) | 37.7 | (1.40) | 39.7 *** | (0.82) |
| Men and boys | | | | | | | | |
| <i>Sample size</i> | 3,521 | – | 743 | – | 666 | – | 1,882 | – |
| Adequate | 66.0 | (0.83) | 67.9 | (1.90) | 65.3 | (1.93) | 65.0 | (1.13) |
| Inadequate | 34.0 | (0.83) | 32.1 | (1.90) | 34.7 | (1.93) | 35.0 | (1.13) |
| Women and girls | | | | | | | | |
| <i>Sample size</i> | 3,440 | – | 830 | – | 638 | – | 1,775 | – |
| Adequate | 57.9 | (0.86) | 63.7 | (1.82) | 59.4 | (2.02) | 55.9 *** | (1.19) |
| Inadequate | 42.1 | (0.86) | 36.3 | (1.82) | 40.6 | (2.02) | 44.1 *** | (1.19) |
| Children 6–18 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 2,050 | – | 641 | – | 377 | – | 918 | – |
| Adequate | 71.3 | (1.00) | 73.6 | (1.75) | 69.8 | (2.36) | 71.6 | (1.47) |
| Inadequate | 28.7 | (1.00) | 26.4 | (1.75) | 30.2 | (2.36) | 28.4 | (1.47) |
| Boys | | | | | | | | |
| <i>Sample size</i> | 1,019 | – | 311 | – | 191 | – | 455 | – |
| Adequate | 74.6 | (1.38) | 78.8 | (2.38) | 71.7 | (3.25) | 74.9 | (2.01) |
| Inadequate | 25.4 | (1.38) | 21.2 | (2.38) | 28.3 | (3.25) | 25.1 | (2.01) |
| Girls | | | | | | | | |
| <i>Sample size</i> | 1,031 | – | 330 | – | 186 | – | 463 | – |
| Adequate | 67.8 | (1.45) | 68.1 | (2.59) | 67.7 | (3.43) | 68.1 | (2.15) |
| Inadequate | 32.2 | (1.45) | 31.9 | (2.59) | 32.3 | (3.43) | 31.9 | (2.15) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|-----------------------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Adults 19–59 years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 3,403 | – | 683 | – | 647 | – | 1,870 | – |
| Adequate | 56.3 | (0.85) | 62.0 | (1.88) | 59.3 | (1.97) | 53.7 *** | (1.15) |
| Inadequate | 43.7 | (0.85) | 38.0 | (1.88) | 40.7 | (1.97) | 46.3 *** | (1.15) |
| Men | | | | | | | | |
| <i>Sample size</i> | 1,733 | – | 323 | – | 327 | – | 969 | – |
| Adequate | 61.0 | (1.18) | 62.7 | (2.71) | 62.3 | (2.71) | 59.2 | (1.59) |
| Inadequate | 39.0 | (1.18) | 37.3 | (2.71) | 37.7 | (2.71) | 40.8 | (1.59) |
| Women | | | | | | | | |
| <i>Sample size</i> | 1,670 | – | 360 | – | 320 | – | 901 | – |
| Adequate | 51.7 | (1.22) | 61.2 | (2.60) | 56.3 | (2.84) | 48.2 *** | (1.67) |
| Inadequate | 48.3 | (1.22) | 38.8 | (2.60) | 43.7 | (2.84) | 51.8 *** | (1.67) |
| Older adults 60+ years old | | | | | | | | |
| Both genders | | | | | | | | |
| <i>Sample size</i> | 1,508 | – | 249 | – | 280 | – | 869 | – |
| Adequate | 69.7 | (1.19) | 69.7 | (2.79) | 64.4 | (2.80) | 69.8 | (1.59) |
| Inadequate | 30.3 | (1.19) | 30.3 | (2.79) | 35.6 | (2.80) | 30.2 | (1.59) |
| Men | | | | | | | | |
| <i>Sample size</i> | 769 | – | 109 | – | 148 | – | 458 | – |
| Adequate | 73.6 | (1.60) | 73.5 | (4.25) | 68.8 | (3.77) | 73.7 | (2.11) |
| Inadequate | 26.4 | (1.60) | 26.5 | (4.25) | 31.2 | (3.77) | 26.3 | (2.11) |

| Subgroup | All Individuals | | SNAP Participants | | Income-Eligible Nonparticipants | | Higher Income Nonparticipants | |
|--------------------|-----------------|----------------|-------------------|----------------|---------------------------------|----------------|-------------------------------|----------------|
| | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error | Percent | Standard Error |
| Women | | | | | | | | |
| <i>Sample size</i> | 739 | – | 140 | – | 132 | – | 411 | – |
| Adequate | 66.5 | (1.71) | 66.6 | (3.70) | 60.8 | (4.03) | 66.7 | (2.32) |
| Inadequate | 33.5 | (1.71) | 33.4 | (3.70) | 39.2 | (4.03) | 33.3 | (2.32) |

Notes: “All individuals” includes respondents with missing SNAP participation or income. For both children and adults, urinary iodine concentrations are defined as follows: adequate if ≥ 100 micrograms per liter (mcg/L) and inadequate if < 100 mcg/L. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population, such that different age distributions of SNAP participants and nonparticipants are accounted for. Significant differences in estimates are noted by $*p < .05$, $**p < .01$, or $***p < .001$. Differences were tested using two-sample *t*-tests comparing SNAP participants with income-eligible nonparticipants or higher income nonparticipants. SNAP participants consist of individuals in households that at the time of data collection reported receiving SNAP benefits.

– Denotes not applicable

Source: National Health And Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES respondents aged 12 and older with complete day 1 dietary recall data and blood biomarker data. Sample excludes pregnant and breastfeeding women 20–44 years old; pregnant and breastfeeding women outside of these age ranges could not be identified in the data.