



Fruit and Vegetable Consumption Among Adults: United States, August 2021–August 2023

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Key findings

Data from the National Health and Nutrition Examination Survey

- During August 2021–August 2023, 69.9% of adults age 20 and older consumed any fruit on a given day, with a higher percentage of women consuming fruit (73.5%) than men (66.1%), particularly citrus, melons, or berries, and other whole fruits.
- More than 9 in 10 adults consumed any vegetables on a given day (93.3%), and no difference by sex was seen.
- The percentage of adults consuming any fruit; citrus, melons, or berries; and other types of whole fruit increased with increasing family income.
- The percentage of adults consuming any vegetables, dark green vegetables, red or orange vegetables, and other vegetable types increased with increasing family income.

Introduction

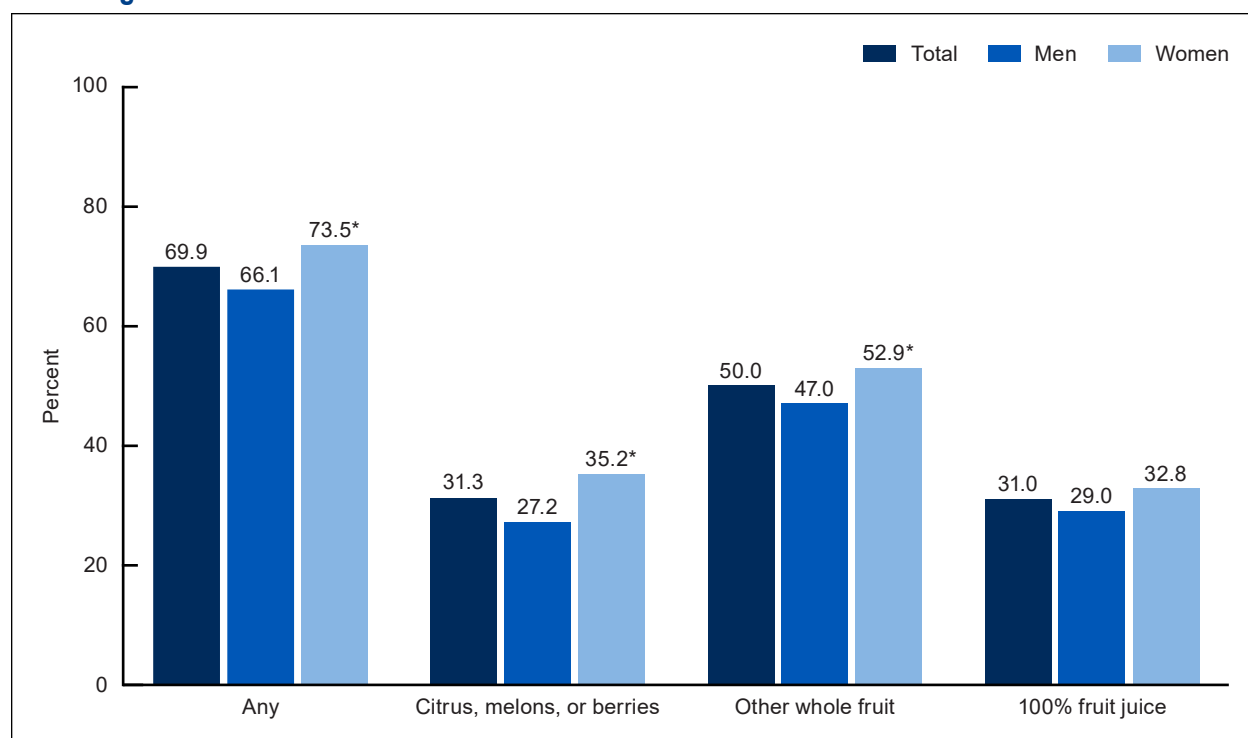
Consuming fruits and vegetables provides essential nutrients, such as vitamins and fiber, and reduces the risk of chronic disease (1–3). The 2025–2030 Dietary Guidelines for Americans recommends that adults consume a variety of fruits and vegetables (1). During 2015–2018, 67.3% of U.S. adults consumed fruit on a given day and 95.0% consumed vegetables (4). This report provides updated estimates of the percentage of adults age 20 and older who consumed fruits and vegetables on a given day during August 2021–August 2023, including the types of fruits and vegetables.



Fruit consumption by sex

- During August 2021–August 2023, 69.9% of adults age 20 and older consumed any fruit on a given day. A higher percentage of women consumed fruit (73.5%) than men (66.1%) (Figure 1, Table 1).
- More women than men consumed citrus, melons, or berries (35.2% compared with 27.2%, respectively) and other whole fruit (52.9% compared with 47.0%).
- No significant difference was seen in the percentage of adults consuming 100% fruit juice by sex.

Figure 1. Percentage of adults who consumed fruit on a given day, by sex: United States, August 2021–August 2023



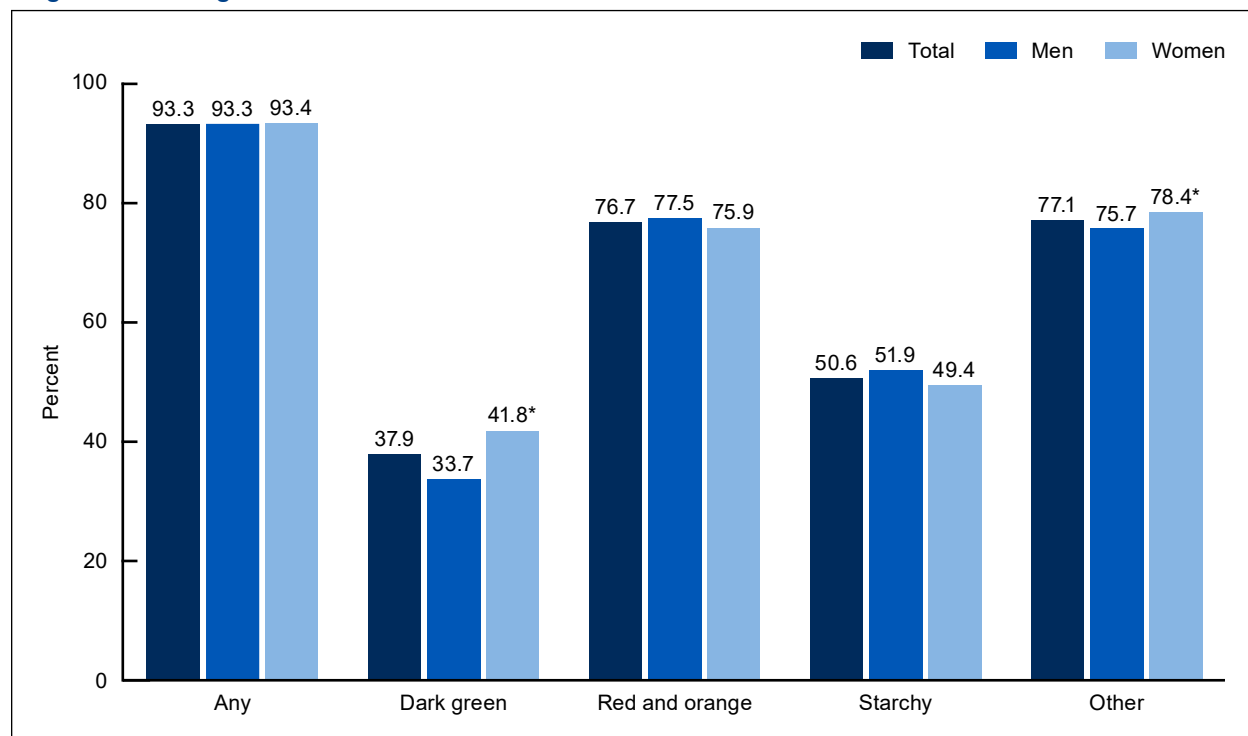
* Significantly different from men ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Vegetable consumption by sex

- Overall, 93.3% of adults consumed any vegetables on a given day, and vegetable consumption was similar between men and women (Figure 2, Table 2).
- More women than men consumed dark green vegetables (41.8% compared with 33.7%, respectively) and other vegetables (78.4% compared with 75.7%).

Figure 2. Percentage of adults who consumed vegetables on a given day, by sex: United States, August 2021–August 2023



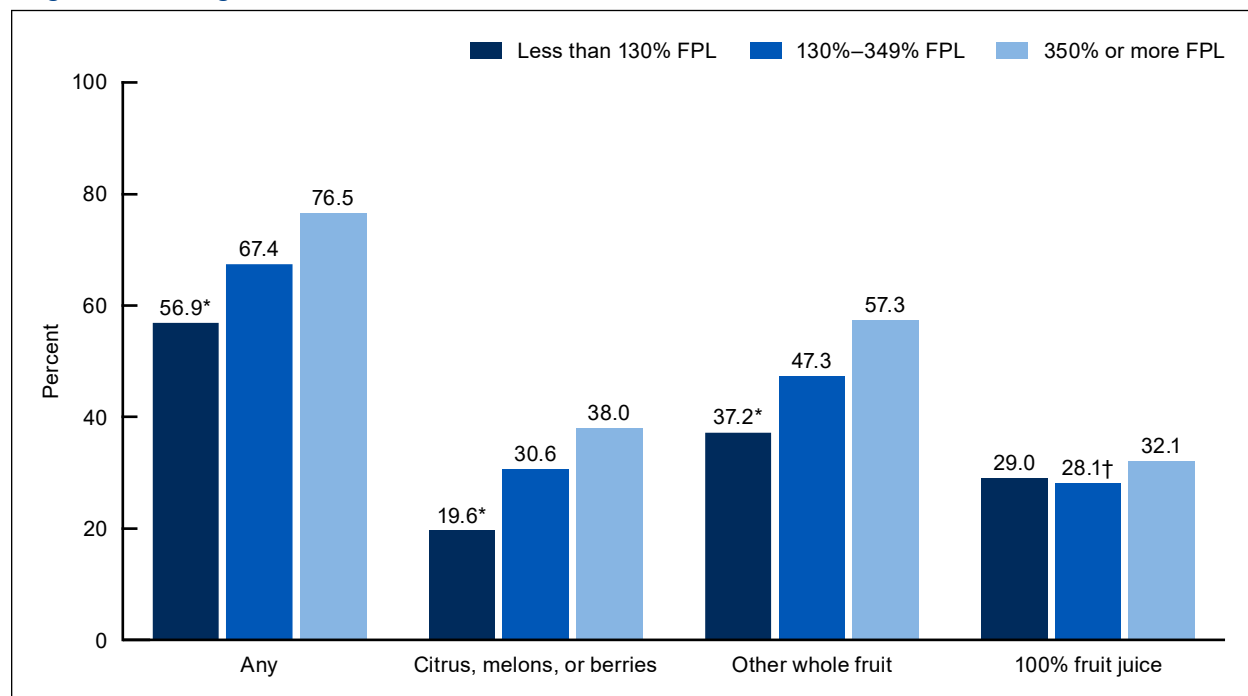
* Significantly different from men ($p < 0.05$).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Fruit consumption by family income

- The percentage of adults who consumed any fruit on a given day increased with family income, from 56.9% among adults with family income less than 130% of the federal poverty level (FPL) to 67.4% among adults at 130%–349% FPL and 76.5% among those at 350% or more FPL (Figure 3, Table 3).
- The percentage of adults consuming citrus, melons, or berries increased with family income, from 19.6% among adults with family incomes below 130% FPL to 30.6% among those at 130%–349% FPL and 38.0% among those at 350% or more FPL. A similar pattern was observed for other whole fruit consumption, which increased from 37.2% to 47.3% and 57.3%, respectively, across the three family income groups.
- A higher percentage of adults at 350% or more FPL reported consuming 100% fruit juice than adults at 130%–349% FPL. The observed difference between adults with family incomes less than 130% FPL and those at 350% or more FPL was not significant.

Figure 3. Percentage of adults who consumed fruit on a given day, by family income: United States, August 2021–August 2023



* Significant increasing linear trend ($p < 0.05$).

† Significantly different from 350% or more of the federal poverty level (FPL) ($p < 0.05$).

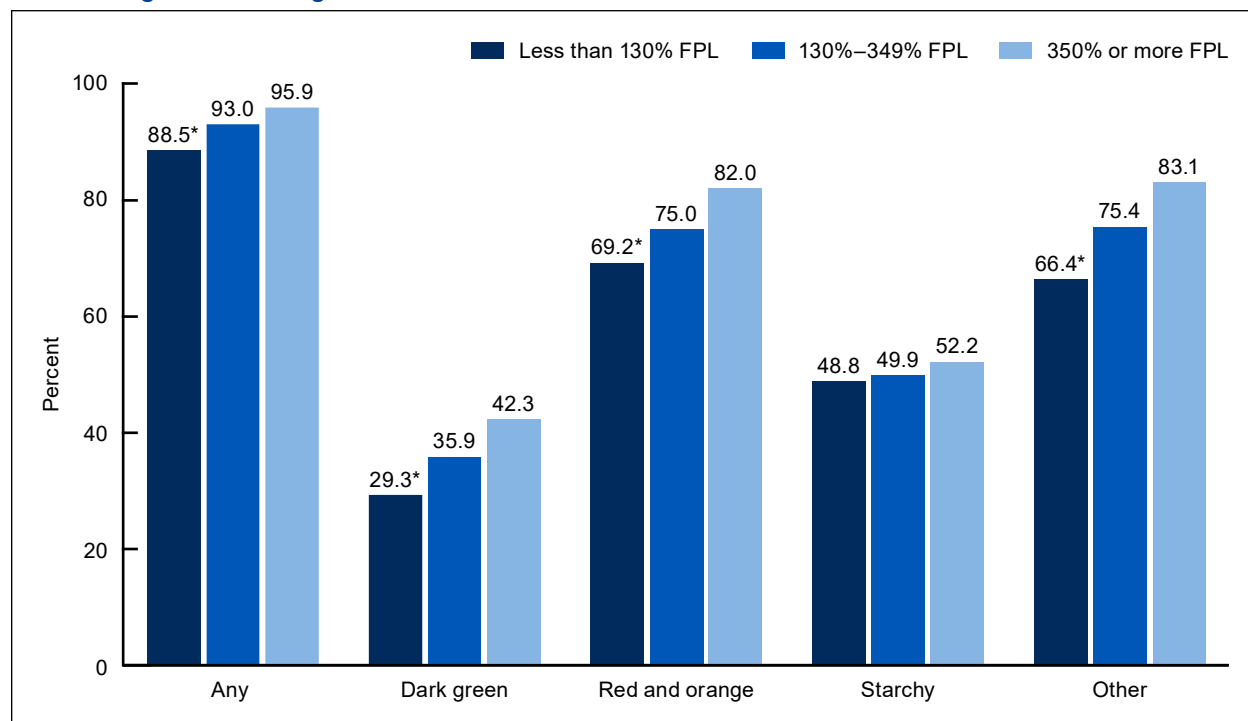
NOTE: Income level is defined by FPL; 11.6% of adults are missing income information.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Vegetable consumption by family income

- The percentage of adults consuming any vegetables on a given day increased with family income, from 88.5% among adults with family income of less than 130% FPL to 93.0% among adults at 130%–349% FPL to 95.9% among adults at 350% or more FPL ([Figure 4](#), [Table 4](#)).
- The percentage of adults consuming dark green vegetables increased with family income, from 29.3% among adults with family incomes below 130% FPL to 35.9% among those at 130%–349% FPL and 42.3% among those at 350% or more FPL. A similar pattern was observed for red and orange vegetables (69.2%, 75.0%, and 82.0%), and other vegetables (66.4%, 75.4%, and 83.1%).
- No significant differences were seen in the percentage of adults consuming starchy vegetables by family income.

Figure 4. Percentage of adults who consumed vegetables on a given day, by family income: United States, August 2021–August 2023



* Significant increasing linear trend ($p < 0.05$).

NOTE: Income level is defined by federal poverty level (FPL); 11.6% of adults are missing income information.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.

Summary

This report provides the most recent estimates in the percentage of U.S. adults who consume fruit and vegetables. During August 2021–August 2023, 69.9% of adults consumed any fruit on a given day and 93.3% consumed any vegetables. Women were more likely than men to consume fruit overall, particularly citrus, melons, or berries, and other whole fruits, as well as dark green vegetables and other vegetables. The percentage of adults who consumed fruit and vegetables, including citrus, melons, or berries, and other whole fruit, dark green vegetables, red and orange vegetables, and other vegetables, increased with family income.

Patterns by sex and family income were generally consistent between 2015–2018 (4) and August 2021–August 2023. During both survey periods, nearly 7 in 10 adults consumed fruit and more than 9 in 10 adults consumed vegetables on a given day.

Definitions

Federal poverty level: Levels were based on the ratio of annual total family income to the poverty guidelines defined by the U.S. Department of Health and Human Services, adjusted for inflation and family size (5).

Food groups (types): For this analysis, a custom Food Patterns Equivalents Database (FPED) file was used to define types of fruits and vegetables. Because the U.S. Department of Agriculture (USDA)'s FPED file for the August 2021–August 2023 National Health and Nutrition Examination Survey (NHANES) is not yet available, a custom FPED file was developed by applying the established USDA procedures used to create earlier FPED files (6) and using the 2017–2018 food pattern equivalents assignments for ingredients.

FPED converts foods reported in NHANES into individual ingredients and assigns them to USDA Food Pattern components (such as food groups and subgroups) (6). Fruit groups or types included total fruit; citrus, melons, or berries; other fruit; and 100% fruit juice. Vegetable groups or types included total vegetables, dark green vegetables, red and orange vegetables, starchy vegetables, and other vegetables.

Data source and methods

Data from the August 2021–August 2023 NHANES were used to estimate the percentage of adults consuming fruit and vegetables on a given day. NHANES is a nationally representative, cross-sectional survey that collects data from adults and children in the United States to assess health, nutrition, diet, and health behaviors. Data are collected through in-home interviews, as well as health examinations and laboratory tests conducted in mobile examination centers (MECs).

This report used the NHANES day 1 24-hour dietary recall data collected using the USDA's standardized Automated Multiple-Pass Method. The dietary recall captures foods and beverages consumed over a 24-hour period (midnight-to-midnight). For the August 2021–August 2023 survey cycle, day 1 dietary recalls were collected via telephone interviews conducted 3–7 days after the MEC examination, rather than in person in the MEC as in previous cycles. This change may limit comparability with earlier survey cycles (7). Limitations of self-reported dietary data include misreporting and recall bias. However, dietary recall has been shown to be reliable and valid for estimating population-level dietary intake (8,9).

All estimates accounted for differential probabilities of selection, potential nonresponse, noncoverage, and day of the week using dietary day 1 sample weights (10). Variance estimation accounted for the complex survey design using Taylor series linearization. Pairwise differences were evaluated using *t* statistics. Linear trends by family income were assessed using orthogonal polynomials. Statistical testing was based on a *p* value less than 0.05 significance level. All analyses were conducted using SAS version 9.4 (SAS Institute, Cary, N.C.) and SUDAAN version 11.0 (RTI International, Research Triangle Park, N.C.).

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Figure tables

Data table for Figure 1. Percentage of adults who consumed fruit on a given day, by sex: United States, August 2021–August 2023

Fruit type and sex	Sample size	Percent (95% confidence interval)	Standard error
Any fruit			
Total	4,798	69.9 (66.1–73.7)	1.8
Men	2,115	66.1 (61.4–70.8)	2.2
Women	2,683	73.5* (69.9–77.0)	1.7
Citrus, melons, or berries			
Total	4,798	31.3 (27.5–35.1)	1.8
Men	2,115	27.2 (23.0–31.4)	1.9
Women	2,683	35.2* (31.5–38.8)	1.7
Other whole fruit			
Total	4,798	50.0 (46.0–54.0)	1.9
Men	2,115	47.0 (41.5–52.4)	2.5
Women	2,683	52.9* (49.1–56.6)	1.8
100% fruit juice			
Total	4,798	31.0 (29.3–32.6)	0.8
Men	2,115	29.0 (25.9–32.2)	1.5
Women	2,683	32.8 (30.2–35.4)	1.2
* Significantly different from men ($p < 0.05$). SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.			

Data table for Figure 2. Percentage of adults who consumed vegetables on a given day, by sex: United States, August 2021–August 2023

Vegetable type and sex	Sample size	Percent (95% confidence interval)	Standard error
Any vegetable			
Total	4,798	93.3 (92.4–94.2)	0.4
Men	2,115	93.3 (92.0–94.5)	0.6
Women	2,683	93.4 (92.2–94.6)	0.5
Dark green			
Total	4,798	37.9 (35.4–40.3)	1.2
Men	2,115	33.7 (31.2–36.2)	1.2
Women	2,683	41.8* (38.6–45.0)	1.5
Red and orange			
Total	4,798	76.7 (75.1–78.3)	0.7
Men	2,115	77.5 (74.9–80.2)	1.2
Women	2,683	75.9 (74.3–77.5)	0.7
Starchy			
Total	4,798	50.6 (48.4–52.9)	1.0
Men	2,115	51.9 (49.1–54.8)	1.3
Women	2,683	49.4 (46.5–52.3)	1.4
Other			
Total	4,798	77.1 (74.9–79.3)	1.0
Men	2,115	75.7 (73.3–78.0)	1.1
Women	2,683	78.4* (75.7–81.0)	1.2
* Significantly different from men ($p < 0.05$). SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.			

Data table for Figure 3. Percentage of adults who consumed fruit on a given day, by family income: United States, August 2021–August 2023

Fruit type and income	Sample size	Percent (95% confidence interval)	Standard error
Any fruit			
Less than 130% FPL	872	56.9* (51.0–62.7)	2.7
130%–349% FPL	1,596	67.4 (65.1–69.8)	1.1
350% or more FPL	1,775	76.5 (71.8–81.1)	2.2
Citrus, melons, or berries			
Less than 130% FPL	872	19.6* (15.9–23.4)	1.7
130%–349% FPL	1,596	30.6 (27.4–33.7)	1.5
350% or more FPL	1,775	38.0 (32.4–43.6)	2.6
Other whole fruit			
Less than 130% FPL	872	37.2* (33.2–41.2)	1.9
130%–349% FPL	1,596	47.3 (43.7–50.9)	1.7
350% or more FPL	1,775	57.3 (52.4–62.3)	2.3
100% fruit juice			
Less than 130% FPL	872	29.0 (25.9–32.1)	1.4
130%–349% FPL	1,596	28.1† (25.8–30.5)	1.1
350% or more FPL	1,775	32.1 (29.4–34.8)	1.3
* Significant increasing linear trend ($p < 0.05$). † Significantly different from 350% or more of the federal poverty level (FPL) ($p < 0.05$). NOTE: Income level is defined by FPL; 11.6% of adults are missing income information. SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.			

Data table for Figure 4. Percentage of adults who consumed vegetables on a given day, by family income: United States, August 2021–August 2023

Vegetable type and income	Sample size	Percent (95% confidence interval)	Standard error
Any vegetable			
Less than 130% FPL	872	88.5* (85.4–91.6)	1.4
130%–349% FPL	1,596	93.0 (91.3–94.6)	0.8
350% or more FPL	1,775	95.9 (94.5–97.2)	0.6
Dark green			
Less than 130% FPL	872	29.3* (24.8–33.8)	2.1
130%–349% FPL	1,596	35.9 (30.8–41.1)	2.4
350% or more FPL	1,775	42.3 (39.4–45.2)	1.4
Red and orange			
Less than 130% FPL	872	69.2* (62.9–75.5)	2.9
130%–349% FPL	1,596	75.0 (72.7–77.2)	1.1
350% or more FPL	1,775	82.0 (80.1–84.0)	0.9
Starchy			
Less than 130% FPL	872	48.8 (45.0–52.5)	1.8
130%–349% FPL	1,596	49.9 (45.6–54.1)	2.0
350% or more FPL	1,775	52.2 (49.2–55.2)	1.4
Other			
Less than 130% FPL	872	66.4* (59.5–73.2)	3.2
130%–349% FPL	1,596	75.4 (72.5–78.3)	1.3
350% or more FPL	1,775	83.1 (79.7–86.4)	1.6
* Significant increasing linear trend ($p < 0.05$). NOTE: Income level is defined by federal poverty level (FPL); 11.6% of adults are missing income information. SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023.			

Suggested citation

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