

National study finds diets remain poor for most American children; disparities persist

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Despite consuming fewer sugar-sweetened beverages and more whole grains, most American children and adolescents still eat poorly—and sociodemographic disparities persist, according to an 18-year national study between 1999 and 2016 of U.S. children's dietary trends.

Led by Junxiu Liu and Dariush Mozaffarian of the Friedman School of Nutrition Science and Policy at Tufts University, the study is published today in *JAMA*. The research team analyzed the diets of more than 31,000 U.S. youth, 2-19 years old, based on national data across nine cycles of the National Health and Nutrition Examination Survey (NHANES) between 1999 and 2016. They assessed each child's [diet](#) as poor, intermediate or ideal, based on three validated dietary scores, all of which are designed to measure adherence to accepted nutritional guidelines.

The study finds that a majority—56 percent—of American children and adolescents had diets of poor nutritional quality in 2016. This was despite improvements over the 18-year study period including:

- The proportion of children and adolescents with poor diets declined, 77 percent to 56 percent.
- The proportion of children and adolescents with intermediate diets increased, 23 percent to 44 percent.

At the end of the study period, adolescents (12-19 years old) had the worst diet of three age categories, with 67 percent found to have a poor

diet, compared with 53 percent of children aged 6-11 and 40 percent of children aged 5 and under.

Key dietary disparities persisted, especially based on parental education and household food security status, and worsened by household income. For example, at the end of the study period, 65 percent of children from households in the lowest income category had a poor diet, compared with 47 percent of children in the highest income category.

"This is a classic 'glass half full or half empty' story," said Mozaffarian, dean of the Friedman School and senior author of the study. "Kids' diets are definitely improving, and that's very positive. On the other hand, most still have poor diets, and this is especially a problem for older youth and for kids whose households have less education, income, or [food security](#)."

When the study authors investigated the influence of individual foods and nutrients, they discovered that improvements between 1999 and 2016 amounted to the daily equivalent of:

- Eight fewer ounces of sugar-sweetened beverages (which translated into eight fewer teaspoons of added sugar).
- A half serving more of whole grains (for example, a half slice of whole grain bread or a quarter cup of rolled oats).
- One-fifth serving more of whole fruit (about seven grapes or part of an apple).

"Overall, added sugar intake among American children was reduced by a third, largely because sugary beverages were cut in half," said first author Junxiu Liu, a postdoctoral scholar at the Friedman School. "But, there was little reduction in added sugars consumed from foods, and by 2016, American kids were still eating about 18 teaspoons or about 71.4 grams of added sugar each day—equivalent to one out of every seven

calories. That's much too high."

The researchers found that while intakes of some healthful foods increased, they remained far below general national recommendations. By 2016, Mozaffarian noted, kids were eating:

- About 1.8 daily servings of fruits and vegetables (less than half the recommendation of 4.5 servings).
- One daily serving of whole grains (less than one-third the recommendation of three servings).
- Just under half a daily serving of fish/seafood (less than one-fourth of the recommendation of two servings per week).

The team also found that children's salt intake increased and continued to greatly exceed the recommended daily amount, possibly due to more reliance on processed foods and foods prepared away from home.

The authors point out that several national policy efforts to improve the diets of American children during the study period could have contributed to progress, yet children also continue to be marketed foods with low nutritional value. "Food is the number one cause of chronic illness and death in our country, and these results affect our children—our future," Mozaffarian said.

"Our findings of slowly improving, yet still poor, diets in U.S. children are consistent with the slowing of rises in childhood obesity but not any reversal. Understanding these updated trends in diet quality is crucial to informing priorities to help improve the eating habits and long-term health of all of America's youth," Mozaffarian added.

This is a companion study to Mozaffarian and team's research, published in *JAMA* in 2016, which evaluated the diets of U.S. adults between 1999 and 2014.

Methodology

The researchers used data for U.S. children 2-19 years old from nine cycles of the National Health and Nutrition Examination Survey (NHANES) between 1999 and 2016. NHANES is a nationally representative study maintained by the National Center for Health Statistics. Children aged 12 and older completed the dietary recall on their own. Proxy-assisted interviews (for example, a parent) were conducted for children 6-11 years old, and proxy respondents reported diets for [children](#) aged 5 and younger. Respondents are representative of the national population and completed at least one valid 24-hour dietary recall questionnaire.

The study authors used the USDA Food Patterns Equivalents Database (FPED) and MyPyramid Equivalents Database (MPED) to assess changes in food groups. The authors used the USDA Food and Nutrient Database for Dietary Studies (FNDDS) to assess nutrient intake.

The authors assessed dietary quality using the validated American Heart Association (AHA) diet score, which includes a primary score for consumption of fruits and vegetables, fish/shellfish, [whole grains](#), sodium, and sugar-sweetened beverages, and a secondary AHA score further adding the intakes of nuts/seeds/legumes, processed meat, and saturated fat. As a complement to the AHA score, they used the Healthy Eating Index (HEI)-2015, which measures adherence to the 2015-2020 Dietary Guidelines for Americans.

Limitations of the study include the fact that self-reported [food](#) recall data may be inaccurate due to the possibility that respondents will over-report or under-report certain foods. Also, the dietary scores used have been validated against disease outcomes among adults.

More information: Liu, J., Rehm, C., Onopa, J. & Mozaffarian, D.

(2020). Trends in Diet Quality Among Youth in the United States, 1999-2016. *JAMA*, 323 (12), 1-14. [DOI: 10.1001/jama.2020.0878](https://doi.org/10.1001/jama.2020.0878)

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