New study estimates preventable cancer burden linked to poor diet in the US

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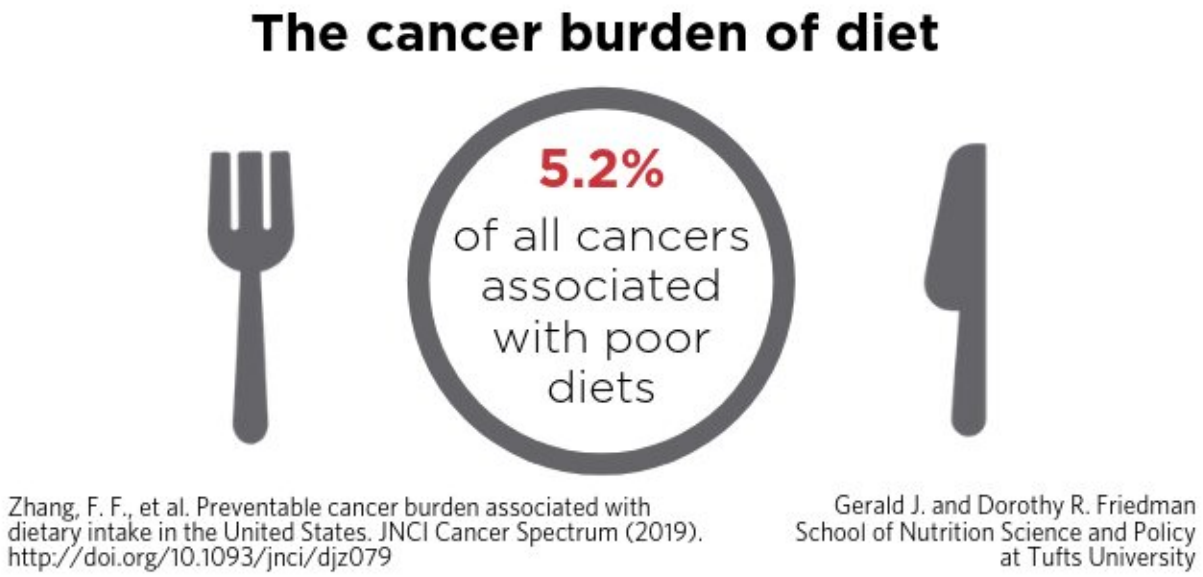

A new study estimates that 5.2 percent of new invasive cancer cases reported in 2015 are associated with poor diets. Credit: Nako Kobayashi/Tufts University

A new modeling study estimates the number, proportion, and type of specific cancers associated with the under or overconsumption of foods and sugar-sweetened beverages among American adults. The analysis is one of the few to focus on the modifiable risk factors for cancer connected to food intake in the United States.

The study, published today in *JNCI Cancer Spectrum*, estimates that diet-related factors may account for 80,110 of the new invasive cancer cases reported in 2015, or 5.2 percent of that year's total among U.S. adults. This is comparable to the cancer burden associated with alcohol, which is 4 to 6 percent. Excessive body weight, meanwhile, is associated with 7 to 8 percent of the cancer burden, and physical inactivity is associated with 2 to 3 percent.

"Our findings underscore the opportunity to reduce cancer burden and disparities in the United States by improving food intake," said first and corresponding author Fang Fang Zhang, a cancer and nutrition researcher at the Friedman School of Nutrition Science and Policy at Tufts.

To estimate the cancer burden associated with suboptimal diet, the researchers utilized the risk estimates of diet and cancer relations based on meta-analyses of prospective cohort studies with limited evidence of bias from confounding, mostly from the World Cancer Research Fund International (WCRF) and the American Institute for Cancer Research (AICR) Third Expert Report.

That report notes that there is convincing or probable evidence for low whole grain, low dairy, high processed meat, and high red meat consumption on colorectal cancer risk; low fruit and vegetable consumption on risk of cancer of the mouth, pharynx, and larynx; and high processed meat consumption on stomach cancer risk. The researchers also included sugar-sweetened beverages in the study due to known associations between obesity and 13 types of cancer.

The study's main findings include:

- Colorectal cancer had the highest proportion of diet-related cases, with 38.3 percent of all cases in 2015 associated with

suboptimal diets. This was followed by cancer of the mouth, pharynx, and larynx, which the study linked to diet in 25.9 percent of all cases.

- Low whole grain intake was associated with the largest number and proportion of new cancer cases, followed by low dairy intake, high processed meat intake, low vegetable and fruit intake, high red meat intake, and high intake of sugar-sweetened beverages.
- The largest number of cancer cases associated with poor diet was for colorectal cancer (52,225). That was followed by cancer of the mouth, pharynx, and larynx (14,421), uterine cancer (3,165), breast cancer (post-menopausal) (3,059), kidney cancer (2,017), stomach cancer (1,564), and liver cancer (1,000).
- Of the diet-associated cancer cases, approximately 16 percent were attributable to obesity-mediated pathways.
- Men, middle-aged Americans (45-64 years), and some racial/ethnic groups (non-Hispanic blacks, Hispanics, and others) had the highest proportion of diet-associated cancer burden compared to other age, gender, or racial/ethnic groups.

The researchers estimated current intake for the seven dietary factors using data from two recent National Health and Nutrition Examination Survey cycles (2013-2014 and 2015-2016). The team linked intake data with cancer incidences in 2015 recorded by the Centers for Disease Control and Prevention's National Program for Cancer Registries and the National Cancer Institute's Surveillance, Epidemiology, and End Results program.

The team defined optimal dietary intake based on the dietary distributions associated with the lowest disease risk as assessed by the World Health Organization's Global Burden of Disease (GBD) project. The researchers modified the GBD comparative risk assessment framework's population-attributable fraction (PAF) equation to estimate

the proportion of all cancer cases that can be attributed to suboptimal diet in each age, gender, and race/ethnicity stratum.

The researchers caution that self-reported dietary intake data is subject to measurement error. In addition, diet-cancer risk estimates may differ by sex, age, race/ethnicity and other modifiers. It was not possible to account for how the dietary factors might interact with each other when consumed together.

Food-PRICE initiative

This study is a part of the Food Policy Review and Intervention Cost-Effectiveness (Food-PRICE) research initiative, a National Institutes of Health-funded collaboration led by researchers at the Friedman School working to identify cost-effective nutrition strategies to improve population health in the United States.

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