8 Factors May Link Disparities in Cancer Death Rates and Income

A new study links poor access to affordable, healthy food to an increased risk of cancer death.

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People in low- and middle-income counties in the United States are more likely to die of cancer than those who live in high-income counties. Eight factors, including lack of access to high-quality clinical care, food insecurity, smoking, and obesity may explain more than 80% of the relationship between poverty and disparities in cancer death rates at the county level, according to a new study.

Although some of these factors are well known to be associated with cancer, the study is the first to link food insecurity to an increased risk of cancer death. The results were published October 5 in JAMA Network Open.

Understanding the factors that influence geographical disparities in cancer death rates should help researchers develop and test interventions to address those factors at the local level.

“There’s been broader recognition over the last few years that geographic-based disparities are really important and need more attention, but the challenge has been to try to explain that geographic variation,” said Robert Croyle, PhD, director of NCI’s Division of Cancer Control and Population Sciences, who was not involved with the study.

“I think this new work is an important contribution towards disentangling the different factors underlying these variations and understanding their relative importance,” he added.

Looking for Links Between Income and County-Level Disparities

Recent declines in overall cancer death rates vary across the United States. Rates have even risen in some regions of the country over the last few decades. A study published last year showed that, in 2014, the county with the highest overall cancer mortality rate had about 7 times as many cancer deaths per 100,000 residents as the county with the lowest overall cancer mortality rate.

In the new study, researchers, led by Jeremy O’Connor, MD, MHS, and Cary Gross, MD, of the Yale University School of Medicine, measured the relationship between median household income levels in counties across the United States and cancer death rates for these counties in 2014, obtained from the National Center for Health Statistics.

They then looked for factors that could potentially explain the relationship between county-level income and cancer death rates. Thirty-eight factors known to be important to public health were tested in statistical models. “It’s not simply that the lack of dollars in the pocket [directly] causes someone to die from cancer—there must be other steps in the process,” explained Gross. Such intermediate steps are referred to as mediators.

These factors ranged from risky health behaviors, such as smoking and physical inactivity, to the affordability and quality of medical care available in a county. Data on potential mediators were gathered from sources including the Robert Wood Johnson Foundation County Health Rankings, the Centers for Disease Control and Prevention, NCI, and the American Society of Clinical Oncology.

Highlighting the Need to Target More than Just Behaviors

The researchers found substantial variations in cancer death rates across low-, medium-, and high-income counties, confirming findings from previous studies. In low-income counties, the average cancer death rate in 2014 was 230 per 100,000 people, compared with 205 per 100,000 in middle-income counties and 186 per 100,000 in high-income counties.

When they looked at geographic “hot spots” with the highest cancer death rates, the researchers found that many of these were composed of low-income counties.

Out of the 38 factors the team tested in their models, eight mediated the relationship between income and disparities in cancer death rates at the county level. The strongest individual mediator was food insecurity, or the percentage of the population in a county that lacks a reliable source of food.

“I would not have expected this to pop up as the largest mediator, but it makes sense,” said Gross. “It’s well known that food insecurity is associated with obesity, which in and of itself is certainly a risk factor for cancer. It could also be a marker for having to rely on unhealthy foods.”

The second-strongest mediator was the quality of available clinical care, and the next strongest were smoking and physical inactivity. Other mediators were the availability of affordable health care, smoke-free policies, payments to states from Medicaid, and obesity. Together, the eight mediators accounted for more than 80% of the income-related disparities observed in county-level cancer death rates.

The study results highlight the need to focus on both behavioral and structural issues to reduce disparities in cancer death rates, said Gross.

“It is critical that we focus on behavioral factors like helping people lose weight and exercise and stop smoking,” he explained. “But on the other hand, we also really need to lean in and address these structural issues, such as lack of affordable, high-quality health care and lack of accessible, affordable healthy food,” he commented.

Understanding What Interventions Work

Another important finding from the study, explained Gross, was that within the low-income counties, there was still substantial variation in cancer mortality. “It’s not always as simple as rich versus poor. Even among lower-income counties, some are doing much better than others,” he said. “There were some low-income counties that had a better cancer mortality rate than some of the higher-income counties. So, what can we learn from those counties that could perhaps be emulated?”

Additional research is needed in the field to advance these findings, Croyle said. “Testing interventions that target these factors, and then looking at the subsequent impact on disparities—that’s really the next phase of research and evidence that’s needed for cancer control planning,” he explained.

NCI’s rural cancer control research program is currently focusing on low-income communities with the hope of addressing these disparities. NCI recently released a request for grant proposals for interventions to improve the reach and quality of cancer care in rural populations.

“We hope in the future to follow on with additional efforts that are more targeted to public health and behavioral risk factors. Either a purely health care approach or a purely public health approach will be insufficient to address inequities,” Croyle concluded.

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