# Early-Onset Cancers Are on the Rise Worldwide

People under 50 are increasingly likely to develop cancers of the breast, colon, liver and more.

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Early-onset cancers, which arise in adults younger than 50 years of age, have grown increasingly common, especially since 1990, according to findings reported in Nature Reviews Clinical Oncology. The prevalence of cancers of the breast, colon, esophagus, kidney, liver, pancreas, prostate, stomach and thyroid among others, increased over the last few decades.

Over the past several decades, generations of people have undergone major changes to their diet, lifestyle, environment and microbiome. All of these changes have the potential to affect the genome and potentially trigger the development of cancer. But the individual impacts of these changes are mostly understudied. In order to understand the implications of these large-scale changes, prospective cohort studies are needed.

Shuji Ogino, MD, PhD, and Tomotaka Ugai, MD, PhD, of Brigham and Women's Hospital in Boston, and colleagues analyzed data on the prevalence of 14 different cancer types over time. They determined changes in the incidence of early-onset cancers worldwide over time and offered suggestions for lowering prevalence rates.

The researchers used global datasets for various cancer types that had an increasing incidence from 2000 to 2012 in adults younger than 50. Next, they looked at studies that analyzed trends in various risk factors, such as early life exposures. Research that described the clinical characteristics of early-onset cancers in comparison with late-onset cancers helped round out their analyses.

"From our data, we observed something called the birth cohort effect. This effect shows that each successive group of people born at a later time (e.g., decade-later) have a higher risk of developing cancer later in life, likely due to risk factors they were exposed to at a young age," Ogino said in a press release. "We found that this risk is increasing with each generation. For instance, people born in 1960 experienced higher cancer risk before they turn 50 than people born in 1950, and we predict that this risk level will continue to climb in successive generations."

The drastic rise in early-onset cancers began around 1990. This is partly attributable to early diagnosis thanks to higher screening rates as well as greater actual incidence of early-onset

cancers. The researchers found that early life exposures, including diet, weight, lifestyle, environmental exposures and the microbiome have greatly changed in the past few decades. A westernized diet and lifestyle may be driving, at least in part, the early-onset cancer epidemic.

Risk factors for early-onset cancers include smoking, obesity, alcohol consumption, sleep deprivation and eating processed foods. Diabetes, sugary drinks, processed foods, obesity, alcohol use and a sedentary lifestyle have increased dramatically since the 1950s. While adult sleep duration hasn't changed much in years, children are sleeping much less today than they did years ago. According to the researchers, all of these factors have emerged together with a changed microbiome, the ecosystem of bacteria and other microorganisms that live in the intestines and elsewhere in body.

"Among the 14 cancer types on the rise that we studied, eight were related to the digestive system," said Ugai. "The food we eat feeds the microorganisms in our gut. Diet directly affects microbiome composition and eventually these changes can influence disease risk and outcomes."

As a limitation of the study, the authors noted that cancer data from low- and middle-income countries were inadequate, so they were unable to identify trends in cancer incidence over the years. They hope to collect more data and collaborate with international researchers to better monitor global trends. Moreover, extensive cohort data on the risk factors leading to early-onset cancer is not well established. In particular, it will be important to conduct longitudinal studies that include young children who may be followed up for several decades. In addition to further research, they suggested that increasing public awareness about the early-onset cancer epidemic should be an important goal.

"Without such studies, it's difficult to identify what someone having cancer now did decades ago or when one was a child," said Ugai. "Because of this challenge, we aim to run more longitudinal cohort studies in the future where we follow the same cohort of participants over the course of their lives, collecting health data, potentially from electronic health records, and biospecimen at set time points. This is not only more cost effective considering the many cancer types needed to be studied, but I believe it will yield us more accurate insights into cancer risk for generations to come."

Click here to read the study in Nature Reviews Clinical Oncology.

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