

# Overweight and obesity make up for more than 15,000 cancer cases per year in Brazil

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Some 15,000 new cancer cases are diagnosed in Brazil each year, and researchers have found that approximately 4 percent of these cases could be avoided by reducing overweight and obesity.

The epidemiological study was conducted by scientists at the Preventive Medicine Department of the University of São Paulo's Medical School (FM-USP) in Brazil in collaboration with colleagues at Harvard University in the United States. It predicts that the number of new [cancer](#) cases attributable to overweight and obesity will double by 2025, reaching 29,000 cases or 4.6 percent of all new cancer cases in Brazil.

"The main problem is the rising prevalence of overweight and obesity in Brazil. Cancer cases attributable to these two conditions will also rise as a result. Aside from this, the total number of cancer cases is also expected to rise as the population grows and ages," said Leandro Rezende, a Ph.D. student at FM-USP and the first author of an article published in the journal *Cancer Epidemiology*.

The paper, titled "The increasing burden of cancer attributable to high [body mass index](#) in Brazil," describes the results of research funded by a scholarship from the São Paulo Research Foundation—FAPESP and completed at Harvard University.

According to the World Health Organization (WHO), overweight and obesity are associated with a heightened risk of 14 types of cancer: breast (postmenopausal), colon, corpus uteri, gallbladder, kidney, liver,

multiple myeloma, esophagus (adenocarcinoma), ovary, pancreas, prostate (advanced stage), rectum, stomach/cardia and thyroid. These cancers account for about half of all cases of the disease diagnosed in Brazil each year.

## **Brazilian foods habits: quantity over quality**

According to Rezende, the rise in income seen in Brazil in recent years has led to higher levels of consumption, including a preference for ultraprocessed foods.

"The study shows what this nutrition transition means in epidemiological terms," said the FAPESP-supported investigator. "Highly caloric foods, with high levels of sugar, salt and fat, are precisely the cheapest."

## **Methodology**

The study, conducted by Rezende in collaboration with other researchers in Brazil and the US, quantified the contribution of body mass index (BMI) to cancer incidence in terms of population attributable fractions (PAFs), a measure of the proportional reduction in the disease that would occur if exposure to specific risk factors was eliminated.

According to the study, 3.8 percent of the more than 400,000 cancer cases diagnosed in Brazil each year are attributable to high BMI, with a higher burden in women (5.2 percent) than in men (2.6 percent).

The PAF is higher in women both they have a higher average BMI than men, and above all, women are disproportionately affected by ovarian, uterine and breast cancer.

To estimate overweight and obesity in the Brazilian population, the

researchers used BMI data from IBGE's 2002 National Household Budget Survey and 2013 National Health Survey. A ten-year lag is widely used in the scientific literature to account for latency in the development of cancer.

IBGE's surveys showed that approximately 40 percent of the population was overweight or obese in 2002. The proportion had risen to approximately 60 percent in 2013. Taking into account BMI, relative risk, the number of cancer cases and latency, the authors estimated that approximately 10,000 cancer cases in women and 5,400 in men were attributable to high BMI based on measurements from ten years previously.

They obtained cancer incidence data from the National Cancer Institute (INCA) and the WHO's GLOBOCAN database.

To quantify the contribution of overweight and obesity to cancer incidence in Brazil, the authors of the study estimated PAFs attributable to high BMI for 2012 (with existing data) and 2025 (using projections). The fractions were calculated according to gender, age, geographic location, and type of cancer.

## **Regional approach**

The FAPESP-funded study is one of the first to regionally compare the link between obesity and cancer. According to the authors, the highest PAFs for all cancer types were found in the states of the South region (3.4 percent in women and 1.5 percent in men) and the Southeast region (3.3 percent in women and 1.5 percent in men).

In women, the highest PAFs were found in Rio Grande do Sul (3.8 percent), Rio de Janeiro State (3.4 percent) and São Paulo State (3.4 percent). In men, the highest PAFs were found in Mato Grosso do Sul

and São Paulo State (each 1.7 percent).

"BMI rose nationwide, but the impact of obesity was greater in the South and Southeast, especially São Paulo State, Rio de Janeiro State and Rio Grande do Sul, which are richer and have higher BMIs. However, there's no justification for limiting a strategy to prevent cancer and reduce obesity to these two regions," Rezende said.

According to the article, when the authors compared BMI data for 2013 with BMI data for 2002, they found a sharper increase in the North and Northeast than in other regions, which is why the strategy should not be limited. "The data show precautions need to be taken in all regions, not just in the South and Southeast," Rezende said.

## **Public policy**

For José Eluf Neto, Full Professor at FM-USP and principal investigator of the FAPESP-funded project, the point of estimating the link between cancer and obesity is to measure its impact on public health as a basis for action and investment planning.

"Today, we know there's a biological reason for the link. The molecular or metabolic mechanisms are well described. Take insulin, for example. Obesity causes insulin resistance, leading to inflammation and increased cell proliferation," Eluf Neto said.

According to the article published in *Cancer Epidemiology*, sales of ultraprocessed food products rose 103 percent in Latin America between 2000 and 2013. BMI rose sharply among adults in these countries during the same period. For the authors, public health policies relating to taxation, nutritional labeling and restrictions on the marketing of ultraprocessed foods are necessary to reduce overweight and obesity at the population level.

"This growth in Latin American sales reflects the strategy pursued by the food industry, just like that of the tobacco industry," Rezende said.

"When countries introduce a minimal regulation to restrict the marketing of these foods, manufacturers target regions that lack a legal framework to promote better public health."

He said that the growth of ultraprocessed food consumption in Brazil is comparable to what happened with tobacco in the 1980s: "Smoking is mainly a problem in low-income and middle-income countries now because the tobacco industry is focusing on those countries. It's harder to do that in Brazil in 2018 because we have restrictions on advertising, and smoking in closed public spaces has been banned. In the case of ultraprocessed foods, we're still back in the 1980s, as it were. They aren't marketed, labeled or taxed as they should be to protect people's health."

Mexico and the UK, for example, have started to tax sugar-sweetened beverages, Rezende noted.

The researchers are also working on estimates of the contribution made by other factors to [cancer incidence](#) and mortality, such as sedentarism, smoking, diet, and alcohol consumption. They have not yet published results for these factors, but they aim to estimate the proportion of cancer cases that can be considered avoidable in Brazil.

"There are genetic factors that increase the risk of developing cancer, but they can't be changed. Moreover, they don't exclude the other factors that cause the disease. Smoking is the main risk factor or cause of cancer in Brazil, [which is what] we expect our analysis to find, but it's falling significantly, with prevalence in about 15 percent of the population. Other factors are therefore becoming relevant to public policymaking. The data show that efforts to combat smoking can't be abandoned, but combating overweight and [obesity](#) must also be a priority," Rezende said.

**More information:** Leandro Fórnias Machado de Rezende et al, The increasing burden of cancer attributable to high body mass index in Brazil, *Cancer Epidemiology* (2018). [DOI: 10.1016/j.canep.2018.03.006](https://doi.org/10.1016/j.canep.2018.03.006)

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