

# Hyperglycemia is the variable that most affects the number of deaths from heart attack

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Several factors increase the risk of heart attack, such as high blood sugar (hyperglycemia), obesity, abnormal cholesterol levels, high blood

pressure (hypertension), and smoking. A study conducted in Brazil and reported in an article published in the journal *PLOS ONE* has measured the impact of these factors. The researchers analyzed data for the Brazilian population collected between 2005 and 2017, determining the number of deaths attributed to each risk factor. The aim of the study was to contribute to the development of more effective strategies to reduce the incidence of cardiovascular diseases, which have long been the leading causes of death in Brazil.

The study quantified the impact of each factor associated with death from cardiovascular disease. Hyperglycemia correlated 5 to 10 times more than other factors.

The dataset came from government sources such as the Ministry of Health, the Ministry of Social Development and IBGE, the national statistics bureau, as well as foreign sources such as the Global Health Data Exchange (GHDx) and the University of Washington's Institute for Health Metrics and Evaluation (IHME).

"Regardless of the control we used—and we tested variables, statistical models and methods of different kinds—[diabetes](#) was also associated with mortality from cardiovascular disease. Moreover, the association was not confined to the year analyzed but lasted for up to a decade," said Renato Gaspar, one of the study authors. Gaspar is conducting postdoctoral research at the Vascular Biology Laboratory of the Heart Institute (InCor) attached to the University of São Paulo's Medical School (FM-USP).

Previous research had established an equation to calculate the number of deaths prevented or deferred by changes in risk factors. Based on this, the researchers calculated the "premature" mortality rate compared with [average life expectancy](#), concluding that some 5,000 people would not have died from cardiovascular disease in the period analyzed if the

incidence of diabetes had been lower. On the other hand, at least 17,000 deaths were avoided by a reduction in smoking during the 12 years in question.

According to the authors, the findings provide evidence that strategies to reduce smoking were key to reduce mortality from cardiovascular disease.

Differences between men and women were also significant for the scientists, who note that sex-specific disparities reiterated the findings of other studies showing diabetes and hyperglycemia to be more significant risk factors for women than men.

### **Socioeconomic impact**

Cardiovascular disease mortality and incidence fell 21% and 8% respectively between 2005 and 2017 in Brazil, owing mainly to improved access to basic health care as well as the reduction in smoking. This finding took into account the importance of hypertension, which is frequently associated with heart disease. Nevertheless, the contribution of hyperglycemia was seven times that of hypertension, possibly because access to the universal health service and better primary care coverage raised the control of hypertension in the overall population to a higher level.

This analysis was corroborated by the finding that the association between hyperglycemia and cardiovascular disease mortality was independent of socioeconomic status and access to health care. The researchers inserted co-variables into the models analyzed, to adjust for household income, government cash transfer programs such as Bolsa Família, gross domestic product (GDP per capita), the number of physicians per 1,000 inhabitants and primary care coverage.

"Alongside the importance of increasing income, reducing inequality and poverty, and improving health care access and quality, we must look at diabetes and hyperglycemia in a specific way," said Gaspar, noting that excessive consumption of [sugar](#) and related issues are not widely discussed in Brazil. "We need a nutritional education policy. We should discuss whether it's worth putting warnings on high-sugar foods, as we already do on cigarette packs, or levying an extra tax to get manufacturers to cut the amount of sugar in these products. Other countries discuss such things and we should do so here."

To help combat [cardiovascular disease](#), health policy should aim directly to reduce the prevalence of [hyperglycemia](#), via nutritional education, restrictions on foods and beverages with added sugar or improved access to novel classes of drugs that reduce the risk of fatal heart attack faced by diabetics, he said.

**More information:** Renato Simões Gaspar et al, Analysing the impact of modifiable risk factors on cardiovascular disease mortality in Brazil, *PLOS ONE* (2022). [DOI: 10.1371/journal.pone.0269549](https://doi.org/10.1371/journal.pone.0269549)

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