

# Evidence links e-cigarette use with increased odds of prediabetes

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An analysis of data from a large, nationally representative survey of the US population shows that e-cigarette use is associated with increased odds of prediabetes. The findings, which are reported in the *American*

*Journal of Preventive Medicine*, add important evidence about the health effects of e-cigarettes and can help shape public health best practices.

"Our study demonstrated a clear association of prediabetes risk with the use of e-cigarettes," explained lead investigator Shyam Biswal, Ph.D., Department of Environmental Health and Engineering, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, U.S.. "With both [e-cigarette use](#) and prevalence of prediabetes dramatically on the rise in the past decade, our discovery that e-cigarettes carry a similar risk to [traditional cigarettes](#) with respect to diabetes is important for understanding and treating vulnerable individuals."

According to the Centers for Disease Control and Prevention (CDC), traditional cigarette smokers are 30% to 40% more likely than non-smokers to develop type 2 diabetes, which increases their risk for cardiovascular diseases such as atherosclerotic disorders, stroke, and peripheral vascular diseases. E-cigarettes are sometimes promoted as a risk reduction product for current traditional cigarette smokers. The use of e-cigarettes is rising among younger population, which remains a [public health](#) concern.

To determine the association between [e-cigarette](#) use and prediabetes, the investigators analyzed 2016–2018 data from the Behavioral Risk Factor Surveillance System (BRFSS). It is the largest annual nationally representative health survey of US adults with data on health outcomes, health-related risk behaviors, preventive services, and chronic medical conditions. Among the 600,046 respondents, 9%, more than 66,000 individuals, were current e-cigarette users who self-reported prediabetes diagnoses. The data also showed that e-cigarette users have a higher prevalence of high-risk lifestyle factors and worse self-related mental and physical health status than non-smokers.

Survey respondents were 50.4% female, 67.7% non-Hispanic White,

12.2% non-Hispanic Black, 5% Hispanic, and 28.6% were age 35 or older. In this representative sample of US adults, e-cigarette use was associated with greater odds of prediabetes compared to those who did not use e-cigarettes or traditional cigarettes.

The association of e-cigarettes with prediabetes heightens significant concerns for public health officials. "We were surprised by the findings associating prediabetes with e-cigarettes because they are touted as a safer alternative, which we now know is not the case," commented Dr. Biswal. "In the case of cigarette smoking, nicotine has a detrimental effect on insulin action, and it appears that e-cigarettes may also have the same effect."

Prediabetes is reversible with lifestyle management. Based on these findings, the authors make a compelling recommendation for targeting the reduction in e-cigarette use and education of young adults as a therapeutic lifestyle management strategy for the reduction of diabetes risk.

"Our effort for smoking cessation has led to a decrease in smoking traditional cigarettes. With this information, it is time for us to ramp up our public health efforts to promote the cessation of e-cigarettes," cautioned Dr. Biswal.

Prediabetes is defined as the presence of impaired fasting glucose (greater than 100—125 mg/dL), impaired glucose tolerance (greater than 140–199 mg/dL two hours after a 75-g oral intake of glucose), or hemoglobin A1c between 5.7%–6.4%), which indicate an intermediate glycemic state between normal glycemia and diabetes. The CDC has reported that prediabetes has become increasingly common in the past few decades, and recent estimates indicate that 38% of American adults have this condition. It is also on the rise among an increasingly younger population. Projections estimate that by 2030, more than 470 million

people worldwide will be diagnosed with prediabetes.

**More information:** Zhenyu Zhang et al, The Association Between E-Cigarette Use and Prediabetes: Results From the Behavioral Risk Factor Surveillance System, 2016–2018, *American Journal of Preventive Medicine* (2022). [DOI: 10.1016/j.amepre.2021.12.009](https://doi.org/10.1016/j.amepre.2021.12.009)

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