It’s genetic: Some smokers have biological resistance to anti-tobacco policies

Yale UniversityYale University

Despite concerted government efforts to curtail tobacco use, the number of smokers in the United States has remained stable in recent years, rather than declining. The reason: genetics.

New research from the Yale School of Public Health suggests that individuals’ genetics play an important role in whether they respond to tobacco-control policies. The study appears online in the journal PLOS ONE.

Smoking dropped sharply after the Surgeon General’s landmark report on the dangers of tobacco was published in 1964, but rates have plateaued during the past two decades despite increasingly stringent measures to persuade people to quit. The study found biological evidence that may help explain why some people respond to anti-smoking inducements, such as higher taxes and the expansion of clean-air laws, and why others do not.

“We found that for people who are genetically predisposed to tobacco addiction, higher cigarette taxes were not enough to dissuade them from smoking,” said lead researcher Jason M. Fletcher, associate professor in the Department of Health Policy and Management at the Yale School of Public Health. Fletcher, also a former Robert Wood Johnson Foundation Health & Society Scholar, examined the interplay between state-level tobacco taxation and a nicotinic receptor gene in a cross-section of U.S. adults.

The “gene-policy interaction” study, the first of its kind, found that variations in the nicotine receptor were linked to the influence of higher taxes on multiple measures of tobacco use. Individuals with a specific genetic variant decreased their tobacco use by nearly 30 percent when facing high tobacco taxes, while individuals with an alternative genetic variant had no response.

“This study is an important first step in considering how to further reduce adult smoking rates,” said Fletcher. “We need to understand why existing policies do not work for everyone so that we can develop more effective approaches.”

The gap in the effectiveness of tobacco-control policies remains poorly understood. The findings suggest that strategies that do not rely on financial or social consequences may be needed to persuade a still-significant segment of the population to quit, notes Fletcher.

Tobacco use remains the leading cause of preventable death in the United States, and is responsible for more than 400,000 deaths each year, according to the study. Tobacco taxation, meanwhile, has been credited with helping to reduce use by

more than 50 percent since the Surgeon General’s report.

The paper can be viewed online [1]. Funding for the study was provided by a seed grant from the Robert Wood Johnson Foundation Health & Society Scholars Program at Columbia University.

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