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Marijuana, Secondhand Smoke, and Social Acceptability

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On April 20, 2017 at 4:20 pm, 15,000 people in San Francisco's Golden Gate Park lit marijuana joints during the annual 420 Day as part of a national event. The giant cloud of secondhand marijuana smoke was visible from the University of California, San Francisco half a mile away. The cloud embodied the revelers' new freedom on this first 420 Day since November 2016 when California voters legalized recreational marijuana, and represented a growing source of air pollution.

It would have been unthinkable (and illegal) for thousands of people to congregate and smoke tobacco cigarettes in that park. The recognition that secondhand tobacco smoke causes cardiovascular disease, lung and breast cancer, and other diseases^{1,2} motivated passage of laws to protect people from secondhand smoke, including in Golden Gate Park. These laws have the beneficial side effect of stimulating voluntary smokefree home policies, discouraging initiation, supporting smoking cessation, and denormalizing tobacco use.^{3, p. 26-29,4}

Such social norm change is an effective tobacco control strategy, as exemplified by the California Tobacco Control Program, is a broad-based campaign focused on reinforcing the nonsmoking norm aimed at the population as a whole, not just smokers or youth,⁵ that included hard hitting media and support for smokefree environments.⁶ By focusing on the broader social environment, California achieved one of the lowest smoking rates – for both adults and youth – in the United States.^{6,7} Adolescents who perceive secondhand tobacco smoke as dangerous are much less likely to start smoking tobacco compared to those with lower risk perceptions of secondhand smoke.⁸

In contrast to tobacco, marijuana is widely viewed as harmless or even good for you, even something to be celebrated. Perhaps because cannabinoids are useful for treating chemotherapy-induced nausea, chronic pain, and spasms in multiple sclerosis,⁹ marijuana,

especially medical marijuana, is viewed as having positive effects. Nationally, more adolescents used marijuana than tobacco in 2016, with 16% of 10th graders and 25% of 12th graders reporting past 30-day marijuana use compared to 5% and 11% for tobacco.¹⁰ Similarly, adolescents' perceptions of marijuana risk dropped from 58% of 12th graders reporting great risk associated with marijuana in 2006 to 31% in 2016.¹⁰ California adolescents believe that, compared to tobacco, marijuana is less addictive and easier to quit, more socially acceptable, and less harmful to their own and their friends' health as well as to the environment than tobacco cigarettes.¹¹

The evidence that secondhand exposure to marijuana smoke, like the evidence for all health effects of marijuana,⁹ is more limited than for tobacco. But smoke from any source is a complex mixture of thousands of chemicals, including ultrafine particles and toxic gases. Other than nicotine and cannabinoids, tobacco and marijuana smoke are similar.¹² Indeed, the California Environmental Protection Agency identified marijuana smoke as a human carcinogen based largely on the smoke's toxicology.¹³

Cardiovascular effects of breathing secondhand smoke are particularly important because about 80% of the deaths attributed to secondhand tobacco smoke are due to heart disease, including acute myocardial infarction.¹⁴ These effects reflect the highly nonlinear dose-response curve for cardiovascular effects of secondhand smoke,¹⁵ with secondhand exposure nearly as dangerous as active smoking. Like all particulate air pollution,¹⁶ smoking and exposure to secondhand smoke both lead to impairment of endothelial function in humans as measured by arterial flow-mediated dilation¹⁷ (FMD), an effect that occurs in a few minutes in humans¹⁸⁻²⁰ and rats.²¹ Reflecting these rapid effects, implementation of comprehensive smokefree laws are followed by drops in heart attacks and other conditions.^{3, p. 435-443,22,23}

As one would expect based on this evidence, FMD drops in rats after one minute of

marijuana sidestream smoke, with impairment lasting at least 90 minutes (longer than for tobacco smoke), independent of the presence or absence of cannabinoids.²⁴ Consistent with this animal observation, a retrospective study found the risk of myocardial infarction was increased by 4.8 times in the hour after using marijuana.²⁵ Evidence on longer term marijuana use and myocardial infarction is mixed;^{9,26,27} there is consistent evidence on stroke.^{9,28,29} There is, however, already enough evidence to warrant protecting people from secondhand exposure to marijuana smoke.

While marijuana is available in many forms, smoking it remains by far the dominant mode of consumption.³⁰ The evidence that secondhand marijuana smoke is dangerous is more limited than the evidence that secondhand tobacco smoke is, yet there is already at least as much evidence concerning marijuana risk as there was for secondhand tobacco smoke in the late 1970s when the clean indoor air movement started gaining steam. In particular, we know that the cardiovascular effects of secondhand smoke are more important in terms of population impact than cancer, that these effects occur quickly, and that marijuana may be worse than tobacco smoke.²⁴ Further, misperceptions about the harms of marijuana use,¹¹ including the lack of understanding of the harms associated with secondhand smoke, point to the importance of education and policies that bring secondhand marijuana smoke to the forefront. This evidence supports maintaining and expanding clean indoor air laws to include marijuana as part of a public health framework for marijuana regulation.³¹ Stressing the right of all to breathe clean air should also be at the core of educational and legislative efforts to reinforce the marijuana smoke-free norm for everyone.

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CONFLICT OF INTEREST

Nothing to declare.

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