

Thirdhand smoke lingers in casino months after smoking ban

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Credit: Vera Kratochvil/public domain

Decades of smoking in casinos causes the massive buildup of toxic residue on walls, furniture, and in carpets, according to a new study led by scientists at San Diego State University. The researchers found that the residue, known as thirdhand smoke, declined significantly after smoking was banned in a Northern California casino. But even six months later, toxic tobacco smoke residue remained above levels found

in hotels or private homes with smoking bans.

That's particularly important information for considering the health and well-being of casino staff and frequent guests, said the study's lead author, SDSU psychologist Georg Matt. It is also important for casino operators considering the expense and effort needed to clean up the toxic legacy of tobacco use. This study should encourage [casinos](#) to implement [smoking](#) bans sooner than later, Matt said.

"Casinos are unusual environments because of the amount of smoking that takes place 24/7 over long periods of time," he said. "Over years of smoking, layers of smoke residue stick to surfaces and penetrate deep into materials. If you work at a casino that allows smoking or are a guest, you already know you inhale [secondhand smoke](#) every time you breathe. Because the tobacco smoke residue remains long after a smoking ban, you will continue to get exposed even after the secondhand smoke has disappeared."

For the study, Matt and colleagues looked to a casino outside Redding, California, that opened in 1993. In 2014, the casino banned smoking inside the casino for 11 months before rescinding that ban and returned to being a smoking-permissible building. The researchers took surface samples from eight areas inside the casino twice before the [smoking ban](#) took effect, then again six times during the duration of the ban. They also examined fingers and urine of nonsmoking participants who visited the casino over that time.

They analyzed those samples using a chemical detection technique known as liquid chromatography mass spectrometry that singles out the presence of targeted chemicals. Matt's team was looking for the chemical signatures associated with byproducts of tobacco combustion and exposure.

These chemical residues, such as nicotine, cotinine and the potent lung carcinogen known as NNK, can harm people's health when they're exposed to them, even if they aren't smokers themselves. Matt and colleagues have previously found that these thirdhand smoke residues linger in homes for months after indoor smoking has ceased, but they weren't sure what they would find in an environment like casinos.

On the one hand, casinos often have higher concentrations of smokers as guests than homes do, and smoking can take place virtually at all times of the day. On the other hand, casinos are much larger than homes and often feature industrial-strength ventilation systems.

After analyzing their data, the ventilation systems and larger size didn't seem to matter: While air quality immediately improved, thirdhand smoke [residue](#) remained at high levels on surfaces and in dust. The upshot? Even 6 months later, nonsmokers who frequented the casino encountered more thirdhand smoke than nonsmokers who live in homes previously inhabited by smokers, the researchers report today in the journal *Tobacco Control*.

"The casino was much more polluted with thirdhand smoke than any nonsmoker home we have examined to date," Matt said. "That is, nonsmokers are at risk of being exposed to higher concentration of thirdhand smoke in a casino than they would in a thirdhand smoke-polluted home."

Only by intensive surface cleaning—and in some cases surface replacing—can casinos hope to make their environment significantly safer for its guests after imposing a smoking, Matt said. Replacing carpets, furniture, equipment, wallpaper and drywall, and drapery and curtains, and washing/vacuuming the walls, floors and ceilings are necessary to reduce health risks associated with [thirdhand smoke](#).

The longer tobacco is smoked indoors, the more difficult and costly it will become to clean up that indoor environment Matt said.

"Tobacco should never be smoked indoors unless you are prepared to pay the price for extensive clean up," he said. "The sooner you stop smoking indoors, the sooner you will benefit from clean air and the less it will cost to clean up the toxic legacy."

Provided by San Diego State University

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