Secondhand Marijuana Smoke

"Smoke is smoke. Both tobacco and marijuana smoke impair blood vessel function similarly. People should avoid both, and governments who are protecting people against secondhand smoke exposure should include marijuana in those rules."

-Matthew Springer, cardiovascular researcher and Associate Professor of Medicine, University of California, San Francisco

Facts about secondhand marijuana smoke:

- Marijuana smoke is created by burning components of plants in the genus Cannabis.
- Secondhand marijuana smoke is a complex chemical mixture of smoke emitted from combusted marijuana and the smoke that is exhaled by the user.
- Secondhand marijuana smoke contains fine particulate matter that can be breathed deeply into the lungs.
- Secondhand marijuana smoke contains many of the same cancer-causing substances and toxic chemicals as secondhand tobacco smoke. Some of the known carcinogens or toxins present in marijuana smoke include: acetaldehyde, ammonia arsenic, benzene, cadmium, chromium, formaldehyde, hydrogen cyanide, isoprene, lead, mercury, nickel, and quinoline.[i]
- Marijuana smoke contains tetrahydrocannabinol (THC), the active chemical in cannabis.

Health risks of exposure to secondhand marijuana smoke:

Decades ago, people believed secondhand tobacco smoke presented no health risks to nonsmokers. Scientific research since that time changed this perception and led to smoke-free environments. Likewise, scientific research is demonstrating that breathing secondhand marijuana smoke indoors is dangerous to health and therefore should not be allowed in indoor spaces.

Peer-reviewed and published studies do indicate that exposure to secondhand marijuana smoke may have health and safety risks for the general public, especially due to its similar composition to secondhand tobacco smoke.

- Secondhand smoke from combusted marijuana contains fine particulate matter that can be breathed deeply into the lungs,[ii] which can cause lung irritation, asthma attacks, and makes respiratory infections more likely. Exposure to fine particulate matter can exacerbate health problems especially for people with respiratory conditions like asthma, bronchitis, or COPD.[iii]
- Particulate levels from secondhand marijuana smoke are even higher than particulate levels from secondhand tobacco smoke. A study comparing indoor particulate matter 2.5 (PM2.5) levels from secondhand marijuana smoke and secondhand tobacco smoke concluded that "the average PM2.5 emission rate of the pre-rolled marijuana joints was found to be 3.5 times the average emission rate of Marlboro tobacco cigarettes, the most popular US cigarette brand." **Smoking a marijuana joint indoors can produce extremely high indoor PM2.5 concentrations**, thereby exposing the public and workers to dangerous secondhand marijuana smoke emissions.[iv]

- Being near people who are using inhaled cannabis is hazardous to human health. In a dispensary that allowed marijuana/cannabis smoking, research scientists discovered that the average PM2.5 emissions was 840 ug/m3 over 9 visits, which exposed patrons and workers to air pollutant concentrations that are beyond hazardous levels.[v]

- On-site consumption of cannabis using electric vaporizers, vape pens, and dab rigs produces a chemical aerosol that pollutes indoor air to unhealthy levels. This diminished air quality was observed when marijuana was not being combusted on-site. Researchers measured high levels of PM2.5 inside a marijuana retailer that allowed vaporizing, dabbing, and vaping marijuana - but did not allow smoking of marijuana or tobacco.[vi]

- Researchers at the University of California at Berkeley studying fine particulate matter exposure found that cannabis bong smoking in the home generated **4 times greater PM2.5 concentrations** than cigarette or tobacco hookah (waterpipe) smoking.[vii]

- In the first "whole-house" study of its kind, researchers measured both tobacco and marijuana secondhand smoke and found that PM2.5 concentrations from marijuana secondhand smoke were 4.4 times higher than emissions from secondhand tobacco smoke. Secondhand marijuana levels were higher than tobacco levels in every room of the house.[viii]

- Significant amounts of mercury, cadmium, nickel, lead, hydrogen cyanide, and chromium, as well as 3 times the amount of ammonia, are found in mainstream marijuana smoke than is in tobacco smoke.[ix]

- In 2009, the California Office of Environmental Health Hazard Assessment added marijuana smoke to its Proposition 65 list of carcinogens and reproductive toxins, also known as the Safe Drinking Water and Toxic Enforcement Act of 1986. It reported that at least 33 individual constituents present in both marijuana smoke and tobacco smoke are Proposition 65 carcinogens.[x, xi]

- Secondhand smoke from marijuana has many of the same chemicals as smoke from tobacco, including those linked to lung cancer.[xii]

- Secondhand marijuana exposure impairs blood vessel function. Published studies on rats show that thirty minutes of exposure to secondhand marijuana smoke at levels comparable to those found in restaurants that allow cigarette smoking led to substantial impairment of blood vessel function. Marijuana smoke exposure had a greater and longer-lasting effect on blood vessel function than exposure to secondhand tobacco smoke.[xiii]

- One minute of exposure to marijuana SHS substantially impairs endothelial function in rats for at least 90 minutes, considerably longer than comparable impairment by tobacco SHS. The findings in rats suggest that SHS can exert similar adverse cardiovascular effects regardless of whether it is from tobacco or marijuana.[xiv]

- Secondhand marijuana smoke and secondhand tobacco smoke is similar in many ways. More research is needed, but the current body of science shows that both tobacco and marijuana smoke have similar chemical composition and suggests that they may have harmful cardiovascular health effects, such as atherosclerosis (partially blocked arteries), heart attack, and stroke.[xv]

- Particle concentrations from dabbing and vaporizing cannabis can create levels of indoor air pollution similar as those seen in extreme air pollution events like wildfires and severe industrial pollution. Exposure at these concentrations can cause cardiovascular and respiratory disease.[xvi]

- People who are exposed to secondhand marijuana smoke can have detectable levels of THC (tetrahydrocannabinol) in their blood and urine.[xvii]

- Marijuana also can be contaminated with mold, insecticides or other chemicals that may be released in secondhand smoke.[xviii]

Including Marijuana Smoking in Smokefree Public Place and Workplace Laws:

- Everyone has the right to breathe smokefree air. Smokefree policies are designed to protect the public and all workers from exposure to the health hazards caused by exposure to secondhand tobacco smoke. The same should be true for secondhand marijuana smoke.

- The percent of U.S. adults who use marijuana more than doubled from 4.1% to 9.5% between 2001-2002 and 2012-2013,[xix] which may also indicate an increase in exposure to secondhand marijuana smoke.

- The American Society for Heating, Refrigeration, and Air Conditioning Engineering (ASHRAE) is the organization that develops engineering standards for building ventilation systems. ASHRAE now bases its ventilation standard for acceptable indoor air quality on an environment that is completely free from secondhand tobacco smoke, secondhand marijuana smoke, and emissions from electronic smoking devices.[xx]

- To protect public health, improve consistency, and aid enforcement, smokefree laws for public places and workplaces should include tobacco as well as marijuana, whether it is smoked or aerosolized. Allowing marijuana smoking in places where smoking is now prohibited could undermine laws that protect the public from exposure to secondhand smoke. The Tobacco Control Legal Consortium issued an informative brief on Lessons from Tobacco Control for Marijuana Regulation.[xxi]

- Smokefree policies provide incentives to quit smoking, help denormalize smoking behavior, and are particularly effective among youth and young adults who are vulnerable to visual cues and social norms of smoking. It is likely that smokefree policies for marijuana will have a similar effect.

- As of January 1, 2025, 1068 localities and 40 states/territories/commonwealths restrict marijuana use in some or all smokefree spaces. Of these, 585 localities and 22 states/territories/commonwealths prohibit smoking and vaping of recreational and medical marijuana in one or more of the following venues: non-hospitality workplaces, restaurants, bars, and/or gambling facilities.

Maintaining the Smokefree Gain from Industry Interference:

- The tobacco industry is setting its sights on the commercialization of marijuana and pushing for on-site consumption to once again normalize smoking and vaping in public, undermining decades of smokefree protections. Creating transparency about the relationships between the cannabis industry, related industries, and policymakers is essential to ensure appropriate regulation of cannabis products.

- An observational study found that nearly **half of lobbyists did not disclose that they represented the cannabis industry or interests**, which makes it difficult for people to track the industry's activity and spending. As the study notes, "The cannabis industry has an interest in creating a regulatory environment which maximizes profits at the cost of public health, similar to the tobacco, alcohol, and food industries." It is imperative for public health advocates to educate policymakers and the public about the cannabis industry's well-funded lobbying

activities that aim to promote their profits over the public's wellbeing.

In the interest of public health, the use of combustible or aerosolized marijuana should be prohibited wherever tobacco smoking is prohibited.

ANR Foundation's Position on Exposure to Secondhand Marijuana Smoke:

Marijuana smoke is a form of indoor air pollution. Therefore, ANR, our lobbying organization, includes marijuana within the definition of smoking, and all of our model laws and policies include a prohibition on smoking marijuana wherever smoking of tobacco products is not allowed. Our organization does not have a position on whether marijuana should be legalized; we are committed to smokefree protections from secondhand smoke from tobacco products, marijuana and aerosol from electronic smoking devices.

Nobody should have to breathe secondhand marijuana smoke at work, in public, or where they live. We want healthy, smokefree air for workers and the public, products like marijuana and electronic smoking devices (which can be used to "vape" a wide range of substances, including marijuana and hash oil) must not be used in smokefree environments where others are forced to breathe the secondhand emissions.

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