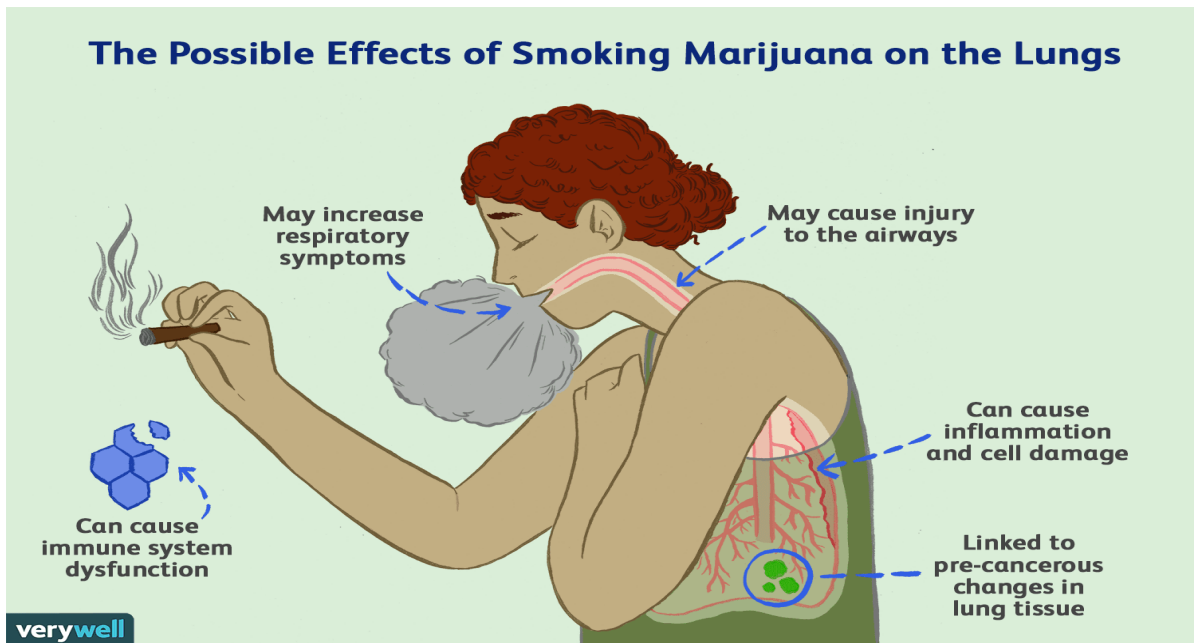


TOBACCO, MARIJUANA and VAPING: Impacts on the Immune System Increasing Vulnerability to the Coronavirus (COVID-19)



Introduction: A recent release from Dr. Stan Glantz of the University of California School of Medicine described the impacts of smoking and vaping on the Coronavirus. The scientist pointed out that among Chinese patients diagnosed with COVID-19 associated pneumonia, the odds of disease progression (including to death) were 14 times higher among people with a history of smoking compared to those who did not smoke. This was the strongest risk factor among those examined. <https://tobacco.ucsf.edu/reduce-your-risk-serious-lung-disease-caused-corona-virus-quitting-smoking-and-vaping>.

While the cannabis industry has made claims that marijuana products benefit the immune system's response to Coronavirus, research shows that the opposite is true. Cannabis alters the body's immune system (by attacking T-cells) and may spread and prolong the Coronavirus (Covid-19). There are some isolated cases where cannabinoids can help reduce inflammation.

However, inflammation is part of the body's healing response. An inflammatory response acts as the body's defense mechanism in case of infection or damage. It helps to trap harmful pathogens, isolate damaged parts of the body, and keep the infection from spreading further. The Federal Trade Commission warned: "There currently are no vaccines, pills, potions, lotions, lozenges or other prescription or over-the-counter products available to treat/cure coronavirus (COVID-19)."

In addition to suppressing the immune system, cannabis users spread the disease by sharing joints, bongs and vapes, passing them from hand- to- hand and mouth- to- mouth. Additionally, those high on marijuana products including joints, blunts, spliffs, vapes and other nicotine-THC



cross-over products as well as edibles are more likely to engage in risky behaviors and lack discerning judgement around preventing the spread of infectious diseases.

Studies also show that direct use and secondhand smoke of tobacco, marijuana and cannabis/tobacco “cross-over” products including vapes compromise the ability of lungs to fight infections and viruses. Some cannabis products come with bacteria and fungus that also compromise immunity. More details below, with links and references on last page.

San Francisco Chronicle (3/12/2020): “Can Smoking or Vaping Put You at Risk” :
<https://www.sfgate.com/bayarea/article/Does-smoking-vaping-put-you-at-a-higher-risk-of-15127641.php>

Tobacco-Free California: Marijuana secondhand smoke is dangerous, containing many of the same cancer-causing chemicals and toxic chemicals as cigarette secondhand smoke.

It has significantly higher amounts of toxic chemicals such as tar and ammonia, and more than twice the amount of hydrogen cyanide, an extremely poisonous chemical. When you inhale the smoke, you are inhaling into your lungs some of the same hazardous fine particulates found in cigarette smoke. While they are different products, both marijuana and cigarettes produce harmful and toxic secondhand smoke associated with adverse cardiovascular effects like hardening and narrowing of the arteries which could lead to heart attack and stroke. And, unlike traditional tobacco products, research confirms that exposure to secondhand marijuana smoke produces a secondhand high.

Dr. Stan Glantz of UCSF: “Cannabis smoke is very similar to tobacco smoke (other than a different psychoactive agent, THC vs nicotine). *And vaped cannabis* delivers an aerosol of ultrafine particles and chemicals deep into the lungs, too. It would be sensible to stop using these cannabis products, too.”

California Department of Public Health: Secondhand marijuana smoke contains many of the same chemicals and carcinogens as secondhand tobacco smoke. Results from laboratory testing under standard conditions found that secondhand marijuana smoke contained more than twice as much tar and ammonia as tobacco smoke, and more than eight times as much hydrogen cyanide.

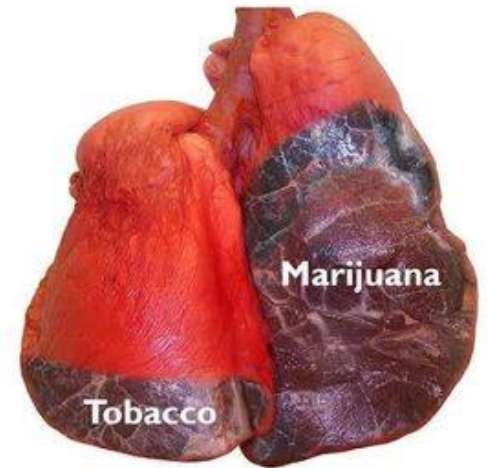
Dr. Shawn Meirovici, (Toronto, Canada physician):

“Immune-suppressing properties in marijuana could potentially prolong a viral infection. Heat and smoke are the last things your throat needs when it’s already itchy and sore. Then, imagine hot smoke entering phlegmy lungs. Smoking can further irritate mucus membranes, making a cough or sore throat even worse. Passing around a joint amongst friends is a fun but quick way to spread germs, so be careful who you light up with.”



Centers for Disease Control states that the people at higher risk of getting very sick or dying from Coronavirus include those with serious chronic medical conditions such as lung disease. This means that if your immune system is impaired or you have a lung problem you are very vulnerable and should avoid smoking, inhaling or secondhand exposure to tobacco, marijuana or cross-over products including THC-nicotine vapes, blunts, bong, and spliffs.

American Lung Association: marijuana is most commonly smoked using pipes, bong, paper-wrapped joints, blunts and other devices including those that heat or vaporize marijuana. Smoking marijuana clearly damages the human lung. Research shows that smoking marijuana causes chronic bronchitis and marijuana smoke has been shown to injure the cell linings of the large airways, which could explain why smoking marijuana leads to symptoms such as chronic cough, phlegm production, wheeze and acute bronchitis. Smoking marijuana can harm more than just the lungs and respiratory system—it can also affect the immune system and the body's ability to fight disease, especially for those whose immune systems are already weakened from immunosuppressive drugs or diseases, such as HIV infection. Smoking marijuana hurts the lungs' first line of defense against infection by killing cells that help remove dust and germs as well as causing more mucus to be formed. In addition, it also suppresses the immune system. Studies have shown that smoking marijuana may increase the risk of opportunistic infections among those who are HIV positive. <https://www.lung.org/stop-smoking/smoking-facts/marijuana-and-lung-health.html>



Marijuana deposits four times more tar in the lungs than tobacco

NIH (National Institute of Health) studies quoted by the National Institute on Drug Abuse:

Marijuana smoking is associated with large airway inflammation, increased airway resistance, and lung hyperinflation, and those who smoke marijuana regularly report more symptoms of chronic bronchitis than those who do not smoke.

One study found that people who frequently smoke marijuana had more outpatient medical visits for respiratory problems than those who do not smoke.

Some case studies have suggested that, because of THC's immune-suppressing effects, smoking marijuana might increase susceptibility to lung infections, such as pneumonia, in people with immune deficiencies.

Smoking marijuana may also reduce the respiratory system's immune response, increasing the likelihood of the person acquiring respiratory infections, including pneumonia.

National Institute on Drug Abuse (NIDA): COVID-19 has rapidly spread throughout the world and though there is some confusion about the details of the disease and its spread, one thing is certain: there are populations within the United States that are particularly vulnerable. Among these vulnerable populations, are individuals who smoke or vape marijuana, or have a history of smoking or vaping marijuana.

Underlying respiratory issues are a serious risk factor for negative outcomes from COVID-19. NIDA reports that "Because it attacks the lungs, the coronavirus that causes COVID-19 could be an especially serious threat to those who smoke tobacco or marijuana or who vape:"

A report published by the Journal of the American Medical Association reviewed data from China and found that the case fatality rate for COVID-19 was 6.3 percent for people with chronic respiratory disease, compared with 2.3 percent overall (National Institute on Drug Abuse, 2020).

- Deaths and serious illness from COVID-19 have been concentrated among vulnerable populations. NIDA reports, that it "is therefore reasonable to be concerned that compromised lung function or lung disease related to smoking history, such as chronic obstructive pulmonary disease (COPD), could put people at risk for serious complications of COVID-19."
- NIDA also reports that vaping can harm lung health just as smoking can, and as such, people who vape can be exposed to increased risk from COVID-19.
- In 2019, the country experienced a vaping crisis in which as many as 2,739 people were hospitalized and 68 people died (Centers for Disease Control and Prevention, 2020). The more than 2,700 people who were hospitalized and suffer from residual complications associated with vaping-related lung illness are at an increased risk of severe COVID-19.



NIDA concludes: "We can make educated guesses based on past experience that people with compromised health due to smoking or vaping and people with opioid, methamphetamine, cannabis, and other substance use disorders could find themselves at increased risk of COVID-19 and its more serious complications- for multiple physiological and social/environmental reasons. The research community should thus be alert to associations between COVID-19 case severity/mortality and substance use, smoking or vaping history, and smoking- or vaping-related lung disease."

CAL-EPA (California Environmental Protection Agency): A comprehensive study of the dangers of marijuana smoke by the Hazard Assessment Branch of the California Environmental Protection Agency concluded in part that:

"There is evidence that marijuana smoke is genotoxic, immunosuppressive, and can alter endocrine function. Studies of 9-THC and other cannabinoids provide evidence for alterations of multiple cell signaling pathways, in endocrine function, and suppression of the innate and adaptive immune response. Prolonged exposures to marijuana smoke in animals and humans cause proliferative and inflammatory lesions in the lung."

National Institute on Drug Abuse: Like tobacco smoke, marijuana smoke is an irritant to the throat and lungs and can cause a heavy cough during use. It also contains levels of volatile chemicals and tar that are similar to tobacco smoke, raising concerns about risk for cancer and lung disease. Marijuana smoking is associated with large airway inflammation, increased airway

resistance, and lung hyperinflation, and those who smoke marijuana regularly report more symptoms of chronic bronchitis than those who do not smoke.

One study found that people who frequently smoke marijuana had more outpatient medical visits for respiratory problems than those who do not smoke.⁶⁹ Some case studies have suggested that, because of THC's immune-suppressing effects, smoking marijuana might increase susceptibility to lung infections, such as pneumonia, in people with immune deficiencies.

California Environmental Protection Agency:

One of the earliest findings in marijuana research was the effect on various immune functions. Cellular immunity is impaired, pulmonary immunity is impaired, and impaired ability to fight infection is now documented in humans. This impairment leaves the patient unable to fight certain infections and fatal diseases. The potential for these complications exists in all forms of administration of marijuana.

University of California, Davis:

A study done at the University of California, Davis (references below) discovered that medical marijuana from 20 dispensaries contained multiple fungal and bacterial contaminants that were highly toxic and can cause serious and sometimes fatal infections among marijuana users. Smoking, vaping or inhaling aerosolized marijuana is a serious health risk, especially for people with chronic conditions or other conditions requiring immunosuppressing therapies. The study revealed a multitude of toxic microorganisms, many of which are known causes of serious lung infections, including *Cryptococcus*, *Mucor*, and *Aspergillus* fungi and *Escherichia coli*, *Klebsiella pneumoniae* and *Acinetobacter baumannii* bacteria.



Annals of Internal Medicine: Contaminants of marijuana smoke are known to include bacteria and fungi. Those at particular risk for the development of infection when these substances are inhaled are people with impaired immunity.

Americans for Nonsmokers' Rights:

How marijuana impacts lungs: 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. 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. Secondhand smoke from marijuana has many of the same chemicals as smoke from tobacco, including those linked to lung cancer. Marijuana smoke exposure had a greater and longer-lasting effect on blood vessel function than exposure to secondhand tobacco smoke. 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.

REFERENCES

University of California School of Medicine: <https://tobacco.ucsf.edu/reduce-your-risk-serious-lung-disease-caused-corona-virus-quitting-smoking-and-vaping>

Tobacco-Free California: <https://tobaccofreeca.com/secondhand-smoke/marijuana-secondhand-smoke-dangers/>

California Department of Public Health:
<https://www.cdph.ca.gov/Programs/CCDPHP/DCDIC/CTCB/CDPH%20Document%20Library/ResearchandEvaluation/FactsandFigures/MJAndTobaccoUseFac%20Sheet-CDPH-CTCP-5-2017.pdf>

CDC (Centers for Disease Control): <https://www.cdc.gov/media/dpk/diseases-and-conditions/coronavirus/coronavirus-2020.html>

<https://www.cdc.gov/marijuana/health-effects.html>

UC Davis. Clinical Microbiology and Infection, titled, “A microbiome assessment of medical marijuana.” <http://www.ucdmc.ucdavis.edu/publish/news/newsroom/11791>. March 13, 2018

Immune Responses Regulated by Cannabidiol, Published Online:27 Feb 2020

<https://www.liebertpub.com/doi/10.1089/can.2018.0073>

How Cannabis Suppresses the Immune System:

<https://www.sciencedaily.com/releases/2010/11/101124214728.htm>

American Lung Association: <https://www.lung.org/stop-smoking/smoking-facts/marijuana-and-lung-health.html>

NIDA (National Institute of Drug Abuse): <https://www.drugabuse.gov/about-nida/noras-blog/2020/03/covid-19-potential-implications-individuals-substance-use-disorders>

<https://www.drugabuse.gov/publications/research-reports/marijuana/what-are-marijuanas-effects-lung-health>

Federal Trade Commission: <https://www.ftc.gov/news-events/blogs/business-blog/2020/03/ftc-fda-warn-companies-making-coronavirus-claims>

Americans for Nonsmokers Rights: <https://no-smoke.org/secondhand-marijuana-smoke-fact-sheet/>

Cal-EPA: <https://calepa.ca.gov/serp/?q=marijuana+smoke+and+lungs>

<https://oehha.ca.gov/media/downloads/proposition-65/chemicals/finalmjsmokehid.pdf>

Annals of Internal Medicine NEJM 1982;306:1249-1254.

Sources: public health organizations and medical schools