

# Smoking, Vaping, and COVID-19

## Emerging Evidence

CAMPAIGN  
for  
TOBACCO-FREE  
Kids

TOBACCO-FREE  
Kids  
ACTION FUND

**Smokers and vapers may be at greater risk for severe illness when confronted with COVID-19.**

- COVID-19 attacks the lungs and behaviors that weaken the lungs put individuals at greater risk. The harmful impact of smoking on the lungs is well-documented, and there is evidence that e-cigarette use (vaping) can also harm lung health.
- It is not surprising that there is mounting concern among leading public health organizations and experts that smokers face a higher risk for severe illness from COVID-19. As vaping impacts the immune system and can harm lung health, e-cigarette users may also face higher risks. We urge all smokers and e-cigarette users to quit in order to protect their health, especially at this critical time.
- In several countries, rumors have been spread that smoking or vaping will protect tobacco users from COVID-19. These are unproven and dangerous. Tobacco kills over 8 million users each year and its harms are scientifically proven.

### Smoking Harms Lung Health

**Smoking damages the lungs and negatively impacts how well they function.**

- The lungs of smokers produce more and thicker mucus than the lungs of nonsmokers. This mucus is both difficult to remove and makes the lungs prone to infection.<sup>1</sup>
- Smoking also inhibits and eventually destroys the cilia, the small hair-like projections on the surfaces of cells in the breathing airway that brush away dirt and other particles to protect the lungs.<sup>2</sup>
- Exposure to cigarette smoke causes airway inflammation. This inflammation and the resulting scar tissue damage the membranes that pass oxygen to the bloodstream.<sup>1</sup>

**Smoking causes lung cancer, chronic obstructed pulmonary disease (COPD), asthma, and other respiratory diseases.**

- The lung diseases caused by smoking occur among smokers and non-smokers exposed to tobacco smoke.<sup>1</sup>
- The lung diseases caused by smoking are among the underlying conditions known to place people at greater risk of more severe illness when diagnosed with COVID-19.<sup>3,4</sup>

### Smoking Impairs Immunity

**Smoking harms the immune system and, therefore, the body's ability to fight infection. This impairment occurs in two different ways.**

- The chemicals in tobacco smoke suppress the activity of different types of immune cells that are involved in general and targeted immune responses.<sup>1</sup>
- The components in tobacco smoke also over-activate immune cells, which are recruited to combat the toxins that are inhaled and their effects. Over time, this pro-inflammatory effect can damage different tissues throughout the body and result in a number of chronic diseases including various autoimmune diseases, cardiovascular disease, cancer, diabetes, and chronic obstructive pulmonary disease (COPD).<sup>1,5</sup>

**Smoking increases susceptibility to respiratory infections.<sup>1</sup>**

- There is overwhelming evidence that people who smoke are at higher risk of getting viral and bacterial respiratory infections:
  - o Smokers have two to four times the risk of pneumococcal diseases like pneumonia and meningitis than nonsmokers.
  - o Influenza risk is twice as high in smokers compared with nonsmokers.
  - o Smokers have about twice the risk of contracting tuberculosis.<sup>6</sup>

In light of smoking's negative impacts on the immune system and smokers' increased susceptibility to other respiratory infections, it is likely that smoking is associated with increased risk of infection with the novel coronavirus.

The World Health Organization has emphasized that smoking requires repeated hand-to-face motion, which

increases the risk of viral transmission from fingers and cigarettes to the mouth.<sup>3,7</sup> Along the same lines, many have raised concerns that waterpipe use, which often involves using shared mouthpieces in social settings, contributes to the spread of the novel coronavirus.<sup>8,9</sup>

## Smoking is a Leading Risk Factor for Noncommunicable Diseases (NCDs)

- Smoking causes cancer, COPD and other lung diseases, cardiovascular disease, and diabetes.<sup>1</sup>
- Conditions like respiratory and cardiovascular diseases increase risk of severe disease in patients infected with other known coronaviruses, including those that cause MERS and SARS.<sup>10</sup>
- The World Health Organization has stated that people with NCDs appear to be at higher risk for experiencing more severe forms of COVID-19.<sup>3</sup>

**According to the WHO, available research suggests that smokers are at greater risk of developing severe disease and dying from COVID-19,<sup>11</sup> including the following:**

One of the largest early studies investigating associations between smoking and COVID-19 examined clinical outcomes from 1,099 patients with lab-confirmed COVID-19 infection from 552 hospitals across China. This study reports that 12.4% of current smokers died, were admitted to an intensive care unit or required mechanical ventilation, compared with 4.7% of nonsmokers. Along similar lines, 21.2% of current smokers had severe symptoms, as opposed to 14.5% of nonsmokers.<sup>12</sup>

## Vaping Impacts Health

Early studies into the effects of e-cigarette use show detrimental effects on the lungs, as well as the immune and cardiovascular systems. This research, considered alongside emerging evidence that patients with compromised respiratory, immune, and cardiovascular systems are at higher risk for severe COVID-19 infection, has led health authorities and others to caution against using e-cigarettes, particularly amidst the coronavirus pandemic.<sup>13,14,15</sup>

- **Lungs:** Exposure to e-cigarette aerosol can have negative effects on various types of lung cells, including those involved in maintaining normal, healthy lung function.<sup>16</sup>
- **Immune Response:** E-cigarette aerosol also inhibits and can kill several kinds of immune cells in the lungs, compromising the lungs ability to fight infection.<sup>16</sup> Additionally, nicotine, a critical component of e-cigarette aerosol, is known to suppress immune function throughout the body.<sup>1</sup>

- **Cardiovascular System:** E-cigarette use can have short-term effects in reducing the function of cardiovascular tissue that controls blood flow.<sup>17,18</sup> Although it is too early to draw conclusions on the long-term effects of e-cigarette use, this dysfunction is commonly observed early in the development of cardiovascular disease.<sup>19</sup>

Researchers have not yet found a direct link between e-cigarette use and likelihood of COVID-19 infection or severity of disease in those who are infected. However, given the early evidence of potential health risks from using e-cigarettes, there is mounting concern that people who use e-cigarettes may be at greater risk for severe illness when confronted with COVID-19.

**We urge all smokers and e-cigarette users to make every effort to quit.**

- As countries around the world work to limit the impact of the coronavirus, there has never been a better or more urgent time for people to quit smoking and vaping.
- In order to protect their health and reduce their risk of severe COVID-19 symptoms, we urge all those who smoke or vape to quit. Research has shown that quitting smoking rapidly improves lung function.

## Quitting Smoking Rapidly Improves Lung Health

Quitting smoking improves lung function, immune response, and cardiovascular health, putting former smokers in a stronger position to fight severe infections like COVID-19.

- Within two weeks of quitting smoking, lung function improves.<sup>20</sup> Cilia, the hair-like projections that protect the lungs, regrow and return to normal activity levels, making it easier to fight infection.<sup>21</sup> Many smokers begin to notice a decrease in respiratory symptoms like coughing and shortness of breath within one month of quitting smoking.<sup>22</sup>
- After quitting, the immune inflammation caused by smoking decreases, white blood cell counts return to normal, and immune function improves.<sup>21</sup> Rates of respiratory infections, including pneumonia and bronchitis, are significantly lower among former smokers than current smokers.<sup>22</sup>

- Quitting smoking lowers blood pressure and heart rate almost immediately. Twenty-four hours after quitting smoking, the risk of heart disease begins to decline.<sup>21</sup>

There has never been a better time to quit smoking. According to Dr. Tedros Adhanom Ghebreyesus, Director General of the World Health Organization, “quitting tobacco is one of the best things any person can do for their own health.”<sup>23</sup>

## REFERENCES

1. U.S. Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. Atlanta, GA: U.S. 2014.
2. U.S. Department of Health and Human Services. How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General. Atlanta, GA: U.S. 2010.
3. World Health Organization (WHO). Information Note: COVID-19 and NCDs. Published 23 March 2020.
4. U.S. Centers for Disease Control and Prevention (CDC). Morbidity and Mortality Weekly Report: Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease 2019 – United States, February 12–March 28, 2020. 69(13);382–386. 3 April, 2020.
5. Pahwa R, Goyal A, Bansal P, et al. Chronic Inflammation. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020.
6. Arcavi L and Benowitz NL. Cigarette Smoking and Infection. Arch Intern Med. 2004;164(20):2206–2216.
7. Simons D, Perski O, Brown J. Covid-19: The role of smoking cessation during respiratory virus epidemics. British Medical Journal: Opinion. Published 20 March 2020.
8. WHO Regional Office of the Eastern Mediterranean. Tobacco and waterpipe use increases the risk of suffering from COVID-19. Tobacco Free Initiative. 2020.
9. Kalan et al. Waterpipe Tobacco Smoking: A Potential Conduit of COVID-19. Tobacco Control: Blog. Published 23 March, 2020.
10. Volkow ND. COVID-19: Potential Implications for Individuals with Substance Use Disorders. Nora's Blog: National Institute for Drug Abuse. Published 6 April, 2020.
11. WHO. WHO statement: Tobacco use and COVID-19. Published 11 May, 2020.
12. Guan W, Ni Z, Hu Y, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N Engl J Med 2020.
13. Volkow ND. Collision of the COVID-19 and Addiction Epidemics. Ann Intern Med. 2020; [Epub ahead of print 2 April 2020].
14. Glantz SA. Reduce your risk of serious lung disease caused by corona virus by quitting smoking and vaping. UCSF Center for Tobacco Control Research and Education: Blog. Accessed 13 April, 2020.
15. Mayo Clinic. What smokers need to know about coronavirus. Blog post by Vivien Williams. Published 24 March, 2020.
16. Gotts JE, et al., What are the respiratory effects of e-cigarettes? British Medical Journal. 2019, 366:l5275.
17. U.S. National Academies of Sciences, Engineering, and Medicine. Public health consequences of e-cigarettes. Washington, DC: The National Academies Press. 2018.
18. Caporale A, et al. Acute Effects of Electronic Cigarette Aerosol Inhalation on Vascular Function Detected at Quantitative MRI. Radiology. 2019 :190562.
19. Bonetti PO, et al. Endothelial Dysfunction: A Marker of Atherosclerotic Risk. Arteriosclerosis, Thrombosis, and Vascular Biology. 2003;23:168–175.
20. National Institutes of Health, National Cancer Institute, Smokefree.gov, What Happens When You Quit Smoking?, viewed 30 March 2020.
21. National Cancer Institute. “Benefits of Quitting.”
22. U.S. Department of Health and Human Services. Smoking Cessation. A Report of the Surgeon General. Atlanta, GA: U.S. 2020. Page 311.
23. WHO. “WHO launches new report on the global tobacco epidemic.” Published 26 July 2019. News release. Geneva/Rio de Janeiro.