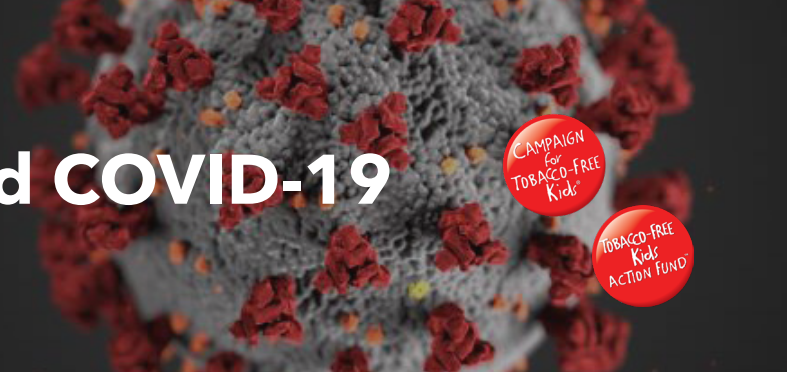
Smoking, Vaping, and COVID-19
Emerging Evidence



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, false information has been spread that smoking or vaping will protect tobacco users from COVID-19. This information is false and dangerous.

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 prone to infection.[1]
- 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.[2]
- Exposure to cigarette smoke causes airway inflammation. This inflammation and the resulting scar tissue damage the membranes that pass oxygen to the bloodstream.[1]

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.[1]
- 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.[3,4]

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.[1]
- 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.)[1,5]

Smoking increases susceptibility to respiratory infections.[1]

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

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.[3,7] Along the same lines, many have raised concerns that waterpipe use, which often involves using shared mouthpieces in social settings, may contribute to the spread of the novel coronavirus.[8,9]

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

- Smoking causes cancer, COPD and other lung diseases, cardiovascular disease, and diabetes.[1]
- 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.[10]
- The World Health Organization asserts that people with NCDs appear to be at higher risk for experiencing more severe forms of COVID-19.[3]

According to the WHO, available research suggests that smokers are likely at greater risk of developing severe disease and dying from COVID-19,[11] including the following two studies:

- 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.[12]
- A recently published study analyzed data from 8,910 patients hospitalized with COVID-19, collected from 169 hospitals across 11 countries in Asia, Europe and North America. The authors controlled for age and sex, two factors that influence smoking rates. They found that smoking was among the factors independently associated with in-hospital death; 9.4% of smokers hospitalized with COVID-19 died, as opposed to 5.6% of former smokers or nonsmokers. Smokers in the study were 1.79 times more likely to die in the hospital of COVID-19 than former smokers or nonsmokers.[13]

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. [14,15,16]

- **Lungs:** Exposure to e-cigarette aerosol has negative effects on various types of lung cells, including those involved in maintaining normal, healthy lung function.[17]
  - Additionally, the potential for e-cigarette use to damage the lungs was highlighted by the outbreak of vaping-induced lung disease seen primarily in the U.S. in 2019. Although that outbreak is fading, recent analysis suggests that inhalation of known and unknown toxic chemicals in e-cigarette emissions will continue to cause lung damage.[18]
- **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.[17] Along these lines, a recent study found that exposure to e-cigarette emissions reduced the likelihood of recovery from influenza.[19] Additionally, nicotine, a critical component of e-cigarette aerosol, is known to suppress immune function throughout the body.[1]
- **Cardiovascular System:** Short-term e-cigarette use can reduce the function of cardiovascular tissue that controls blood flow.[20,21,22,23] 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.[24]

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, this does not mean that links do not exist, and it is reasonable to assume 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.[25] Cilia, the hair-like projections that protect the lungs, regrow and return to normal activity levels, making it easier to fight infection.[26] Many smokers begin to notice a decrease in respiratory symptoms like coughing and shortness of breath within one month of quitting smoking.[27]
- After quitting, the immune inflammation caused by smoking decreases, white blood cell counts return to normal, and immune function improves.[26] Rates of respiratory infections, including pneumonia and bronchitis, are significantly lower among former smokers than current smokers.[27]
- Quitting smoking lowers blood pressure and heart rate almost immediately. Twenty-four hours after quitting smoking, the risk of heart disease begins to decline.[26]

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." [28]

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