

HEATED TOBACCO PRODUCTS: Evidence



Heated tobacco products (HTPs) are tobacco products that require the use of an electronic device to heat a stick or plug of compressed tobacco. The stick (by definition, a cigarette) or plug is heated to a temperature high enough to produce an inhalable aerosol. HTP systems are fully integrated so that the heating device and heated cigarettes or plugs for each system must be used together.



HTP Use

HTPs are so new to the consumer market that data on use is limited.

- In Romania in 2017, 3.1% of youth, 3.8% boys and 2.3% girls, (aged 13-15) currently used heated tobacco products.¹
- In South Korea in 2018, one year after HTPs were first introduced to the market, 2.8% of youth aged 12 to 18 years old reported ever-use of HTPs.²

Dual Use of HTPs and Conventional Cigarettes

Dual use of HTPs and conventional cigarettes has been documented in one country.

- In 2018, 75.5% of the 12 to 18 year-olds in South Korea who reported ever using HTPs were current smokers of conventional cigarettes.²
- Although smokers who had used HTPs were more likely to try to quit smoking, their abstinence rates from conventional cigarettes were far lower than those who had not used HTPs. These results imply that HTP use is associated with reduced smoking cessation rates.³
- In 2018, 96.25% of current HTP users in South Korea age 19 years or older were also current smokers of conventional cigarettes.⁴

Emissions from Heated Cigarettes

Heated cigarettes emit an aerosol containing nicotine, carcinogens such as tobacco-specific nitrosamines and aldehydes, and other harmful chemicals such as carbon monoxide and acrolein.^{5,6,7,8}

HTP Health Risks and Impacts

- Exposure to nicotine adversely affects maternal and fetal health during pregnancy, contributing to preterm delivery and stillbirth and likely increases risk of cardiovascular diseases.⁹ Nicotine exposure during fetal development and adolescence has lasting adverse consequences for brain development.⁹

No Combustion?

Heated tobacco products are marketed as non-combusted tobacco products, but is this really true?

- **Carbonyls and reactive oxygen species have been detected in HTP emissions.** These are chemical compounds emitted during the combustion of organic compounds, indicating that when HTPs are used, combustion occurs.^{15,16}
- **Volatile organic compounds, carbon monoxide and other harmful constituents of tobacco smoke have been documented in IQOS emissions.** These toxic chemicals are products of tobacco pyrolysis, or incomplete combustion, a reaction that produces smoke.¹⁷
- **A 2019 study documented charring during use of IQOS, the HTP produced by Philip Morris International.** Researchers interpreted this charring as evidence of pyrolysis.¹⁸

The use of HTPs involves combustion. Asserting otherwise is an attempt to mislead consumers and policymakers about the harms of using the product. All tobacco product use is dangerous, and HTPs should be strongly regulated to minimize their use and exposure to their emissions.

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- Exposure to tobacco-specific nitrosamines is linked to cancers of the lung, nose, esophagus, liver, pancreas and cervix.¹⁰
- Exposure to aldehydes such as formaldehyde can cause lung and nose cancer, in addition to rendering the lungs more susceptible to infection.⁹
- Exposure to carbon monoxide reduces oxygen delivery to the heart and other tissues, which over time increases the risk of blood clots, heart disease and stroke.⁹
- Exposure to acrolein contributes to plaque build-up in blood vessels as well as blood clot formation, increasing the risk of heart disease and stroke.⁹ Acrolein exposure also damages the lungs' ability to fight infections.⁹
- Laboratory studies examining the effects of IQOS, the HTP manufactured by Philip Morris International, found evidence of cell poisoning and inflammation in lung cells which could lead to lung damage.¹¹
 - At least two reported cases of acute eosinophilic pneumonia have been attributed to use of HTPs.^{12,13}
- One study examining the effects of IQOS found evidence of liver poisoning; a health impact not previously associated with conventional cigarette use.¹⁴



Despite the clean appearance of HTPs, their emissions contain nicotine, carbon monoxide, and many other dangerous chemicals.

Key Messages

- Heated tobacco products carry serious health risks.
- More research is needed to better understand the specific health harms caused by heated tobacco products.
- Governments should consider banning heated tobacco products or applying tobacco control provisions to both the cigarettes and the devices that are fully compliant with WHO Framework Convention on Tobacco Control.

References

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