

EDITORIAL

What dangers does vaping pose to children's health?

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Dear Editor,

with great interest, we read the position statement from the Italian Pediatric Respiratory Society (SIMRI) entitled "Vaping as a new threat for respiratory health." This review comes at a pivotal moment as newer tobacco and nicotine products such as electronic cigarettes and tobacco heating products appear to be increasingly popular among teenagers and young adults.

Focused interventions at an early age, in addition to their preventive nature, aim to ensure the health of adolescents, in the sense that, while the health consequences of tobacco smoking in adults have been adequately investigated and recognised, the consequences of smoking and vaping during prepubescence and adolescence have been underestimated or partially studied.

According to the WHO, 37 million children aged 13–15 years use tobacco globally; the organisation emphasises that the rate of e-cigarette use among adolescents currently exceeds that of adults. Furthermore, the CDC has reported that the most common nicotine product among U.S. high school students is an e-cigarette with 7.8% admitting current use for the previous year, while at least 16,000 flavours have been recorded (1).

The scientific community is closely monitoring this global trend, recognising the health risks of nicotine that may lead to addiction and that young people are more likely to face significant challenges in overcoming addiction later in life. Co-optation of "harm reduction" by the tobacco industry lacks sufficient independent scientific evidence, while there is a looming risk that novel nicotine products may act as a Trojan horse, fostering nicotine addiction and normalizing smoking behaviour among youth. The official ERS statement on novel nicotine and tobacco products aligns with this perspective and is opposed to the rhetoric of 'harm reduction' (2). We appreciate the authors' efforts to shed light on the "anatomy" of electronic cigarettes, pod-mods, and heated tobacco products with or without nicotine, emphasising not only their basic operating characteristics but also making an extensive reference to the main irritant and toxic substances, which, according to current evidence, trigger inflammatory responses at both the airway and systemic levels. Many studies have shown that novel tobacco products may release varying concentrations of compounds, including formaldehyde, vegetable glycerin, acrolein, polycyclic aromatic hydrocarbons, sulphur compounds, metals such as lead, zinc, and significant levels of volatile organic compounds (VOCs), and aldehydes during mixing, heating, or evaporation of the liquid components. The effect of these substances may vary, depending on the frequency and duration of exposure.

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Recent data demonstrated a strong correlation between nicotine, vaping, and respiratory disorders. Primarily, vaping has been correlated with early impairment of lung function characterized by airway hyper-responsiveness, an increase of airway resistance (Raw) even in short-term exposure, impairment of innate immune and anti-viral defences, and severe acute or subacute respiratory illness such as EVALI (E-cigarette or Vaping Associated Lung Injury) and bronchiolitis obliterans syndrome or “popcorn workers” lung. Heated tobacco products influence the cardiovascular system, as their use increases the risk of hypertension, arrhythmias, and vascular endothelial dysfunction. Another study highlights the expression of anxiety symptoms and depression linked to vaping nicotine and tobacco heated products among teens and young adults, a situation that should be taken into consideration by parents and the school community (3).

Moreover, we would like to mention another emerging product, nicotine pouches, which has recently gained popularity across Europe. The intra-oral absorption of nicotine in varying contents and concentrations may impair oral health but may also have genotoxic and potentially oncogenic effects.

Of particular importance is the authors’ reference to dual or triple users who not only failed to quit smoking but instead became trapped in addiction and continued gadget use, with the literature stating that dual users have a higher risk of cardiovascular disease and anxiety than cigarette-only smokers. The potential risks of bystanders’ vaping exposure are not entirely clear, and limited scientific research is available; therefore, more studies are needed to investigate both short-, and long-term effects on vulnerable individuals such as children, pregnant women, the elderly, and people with chronic diseases. This may facilitate counselling and advocacy for a smoke-free future generation.

The authors discuss the potential dangers of vaping during pregnancy. Although there is a lack of studies on the impact of vaping on fetal development, SIMRI highlights several animal studies demonstrating the negative effects of nicotine on fetal lung growth as well as immune function development. There is sufficient concern from these studies to adopt the precautionary principle when it comes counselling expectant mothers on vaping during pregnancy. Some countries such as the

UK have taken a different approach and encourage expectant mothers who smoke tobacco products to swap to vaping. The World Health Organisation (WHO) strongly advises against vaping during pregnancy due to the potential harms of nicotine exposure to the developing foetus. Upcoming research studies will hopefully provide evidence for healthcare professionals on how best to counsel pregnant women on the potential harmful effects of vaping to their offspring (4).

The vaping industry have played a significant role in the rise of adolescent vaping. Vaping manufacturers have clearly deviated from promoting e-cigarettes as a tobacco cessation tool to a selling them as consumer products in recent years. The tactics employed are aimed at enticing adolescents and young adults to taking up vaping. Bright coloured packaging, flavours and sleek advertising on social media all have contributed to the explosion in adolescent vaping. In addition, vaping companies are often one step ahead of public health agencies as newer nicotine products are constantly emerging on the market. Rather than targeting ex-smokers who are hooked on tobacco products, vaping companies seek to recruit new consumers to the market.

The authors highlight that the developing brain is particularly susceptible to the dangers of nicotine addiction. The earlier a person starts vaping, the more likely they are to become addicted. SIMRI echo the concerns of many paediatric societies across the world that we are witnessing the dawn of a new generation of nicotine addicted teenagers. The progress made on decreasing tobacco smoking prevalence across many countries is in jeopardy as we now have evidence that teenagers who vape are more likely to start smoking tobacco products (5).

The authors propose a number of ways we can halt the increase in adolescent vaping. Increased physician awareness and counselling adolescent patients and their families on the potential dangers of vaping is clearly important. In addition, widespread public health campaigns will increase awareness on the facts about vaping rather than the mistruths being disseminated by vaping companies. Enforcement of age of sale bans and increased regulation of the sale of vaping products through legislation is urgently required. At EU level, there is significant inertia to introduce laws which would decrease the prevalence of adolescent vaping. It has

been left to individual countries themselves to bring in legislative measures. Such actions include an outright ban on all e-cigarettes, a ban on all e-liquid flavours apart from tobacco flavours and disposable vapes, restrictions on the marketing and advertising of vaping products as well as the introduction of plain packaging. Some countries have decided to introduce a combination of these legislative measures, and it remains to be seen which ones will prove most effective (6). Certainly, countries that do not act to curtail teenage vaping are placing their

population at risk of potential negative health effects in the future. Paediatric pulmonologists and respiratory societies such as SIMRI play an important advocacy role in calling on governments to regulate effectively on vaping, HTP and newer nicotine products.

In conclusion, SIMRI's position paper provides an important evidence-based update on newer nicotine products. The ten rules outlined provides an excellent road map for paediatricians to follow to protect children from the harms of vaping.

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