

# E-cigarettes and youth smoking: be alert but not alarmed

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Conner *et al*<sup>1</sup> and Best *et al*<sup>2</sup> report the results of two longitudinal studies of teenagers in the UK that examined the relationship between vaping an e-cigarette and smoking a cigarette. Similar to studies conducted in the USA,<sup>3,4</sup> they both report an association between experimentation with vaping and subsequent experimentation with smoking. Fears that an increase in vaping will lead to an increase in smoking among young people via a 'gateway' effect have been used to support greater regulation of vaping products<sup>5</sup> or to advocate for continued prohibition of vaping products containing nicotine in countries that do not allow their sale, possession or use by adults.<sup>6</sup> Are these reasonable responses to these research findings?

Several things should be considered in the interpretation of these studies.

1. A proportion of the young people who try vaping and then smoking would have also tried smoking without trying vaping due to a common liability to experiment with substance use.<sup>5,7</sup>
2. It is plausible that vaping may increase the likelihood of experimenting with smoking through increased familiarity with a behaviour that resembles smoking and/or curiosity about how the two experiences compare.<sup>7,8</sup> But it is unknown how many of those who might try smoking who would not have done so without trying vaping first will then go on to become regular smokers.
3. The baseline waves of these longitudinal studies were conducted in locations and at times when there were no age restrictions on sales of vaping products.<sup>2</sup> In such a regulatory context, it is not surprising that young people may have tried the product with less restrictions first.<sup>5</sup> This pattern may change as 18+ age restrictions are adopted in more jurisdictions.

4. The absolute number of young people regularly vaping or smoking remains low and appears to be decreasing.<sup>9</sup>

There is a growing evidence base that e-cigarettes are assisting smoking cessation among adult smokers at the population level. Using cross-sectional data from adults in the UK who had smoked in the past year, Brown *et al* found that smokers who used an e-cigarette had 60% greater odds of successfully quitting compared with those who used standard nicotine replacement therapy or no cessation aid.<sup>10</sup> Zhu *et al* found that adult smokers in the 2014–2015 US Current Population Survey-Tobacco Use Supplement who used e-cigarettes were more likely to have successfully quit smoking for at least 3 months compared with non-users. Furthermore, the authors noted that for the first time since 2001, overall quit rates had increased, suggesting that vaping has led to an increase in quitting at the population level.<sup>11</sup> Analysing US data from the 2014 and 2015 National Health Interview Surveys, Giovenco and Delnevo found that among adults who had smoked in the past 5 years, daily vaping was the factor most strongly associated with smoking cessation.<sup>12</sup> Longitudinal data reported by Zhang *et al* found that long-term vaping (at least 2 years) was associated with a fourfold higher odds of quitting than among non-users, adjusted for baseline characteristics of the sample.<sup>13</sup> Biener and Hargreaves also observed that daily vaping for at least a month was associated with sixfold greater odds of quitting smoking in another longitudinal study.<sup>14</sup> Similarly, Hitchman *et al* observed daily vaping with advanced devices (tank systems) in the UK to be associated with quit success.<sup>15</sup> Studies of youth experimentation with vaping and smoking should be considered in tandem with these findings that suggest a benefit for adult smokers. Increasing quitting among adult smokers is vital to reducing smoking prevalence and will result in much faster declines than relying only on reducing youth uptake.<sup>16</sup>

What is the most appropriate policy response to these studies that show an association between youth experimentation with vaping and experimentation with smoking? The authors of most of

these studies have suggested their findings support ongoing monitoring and/or restricting youth access to vaping products.<sup>1–4</sup> Some research has suggested that banning sales to minors could have the perverse effect of increasing youth smoking.<sup>17</sup> Evidence from Sweden also suggests youth uptake of snus helped reduce smoking among young men.<sup>18</sup> Nonetheless, facilitating youth uptake of vaping as a harm reduction strategy is unlikely to sit comfortably with many in the public health community, policy makers, parents and the general public. Surveys of vapers show widespread support for allowing sales only to adults,<sup>19–21</sup> and this policy is also supported by vaping trade associations.<sup>22</sup> As teens who are regular smokers could benefit from switching to vaping, it may be justifiable to allow some restricted access, such as via parental supply, medical prescription and/or smoking cessation clinics. However, limiting retail sales of vaping products to adults appears to be well supported and uncontroversial.

Reassuringly, current evidence has not shown an increase in youth smoking since the increase in vaping in the USA or UK. Indeed, the very low level of regular smoking and vaping seen in these longitudinal studies is one of the reasons they have used 'ever use' (even one puff) or any use in the past month to measure vaping and smoking. Between 2011 and 2016, any smoking in the past 30 days declined from 6.3% to 4.3% among middle school students and from 21.8% to 13.8% among high school students in the USA.<sup>9,23</sup> The very low prevalence of smoking among young people is good news that should be celebrated; however, we should remain alert and continue to closely monitor youth vaping and smoking behaviours.

We should not be alarmed about these research findings because overreaction could lead to unintended consequences. Excessive regulation that prevents or deters smokers from switching from smoking to vaping could have the perverse outcome of retaining the most harmful nicotine product (the combustible cigarette) as the most widely used. The best protection against youth smoking uptake would come from radically transforming the current nicotine market so that tobacco cigarettes are no longer sold as an ordinary consumer item alongside bread and milk.

The advent of vaping products that are viable substitutes for combustible cigarettes could well provide the leverage needed to achieve this.<sup>24</sup> A number of endgame strategies to end the cigarette epidemic have been proposed<sup>25</sup> and

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increasingly a role for reduced harm nicotine products, such as e-cigarettes, is being recognised in such proposals.<sup>26 27</sup>

In determining how we respond to research on youth vaping and smoking, we need to consider the whole population (youth and adults) and longer term goals, such as a cigarette endgame. The goal of policy making should be to achieve the optimal regulatory balance that reduces any potential risks that vaping products may pose to young non-smokers while maximising the potential benefit that access to these products could provide to current smokers.<sup>28</sup> In the meantime, ongoing monitoring of smoking and vaping and the relationship between these two behaviours among youth and adults is needed to better understand the potential risks and benefits of vaping products.

**Correction notice** This article has been corrected since it published Online First. To improve the wording, we have replaced “widespread support for restricting sales to adults” with “widespread support for allowing sales only to adults” in the article.

**Contributors** This manuscript was solely written by CEG.

**Competing interests** None declared.

**Provenance and peer review** Commissioned; internally peer reviewed.

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**To cite** Gartner CE. *Tob Control* Published Online First: [please include Day Month Year]. doi:10.1136/tobaccocontrol-2017-054002



► <http://dx.doi.org/10.1136/tobaccocontrol-2016-053539>

► <http://dx.doi.org/10.1136/tobaccocontrol-2017-053691>

*Tob Control* 2017;**0**:1–2.  
doi:10.1136/tobaccocontrol-2017-054002

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