

Commentary on Opazo Breton *et al*: Are declines in smoking prevalence primarily driven by lower initiation of smoking or increases in quitting?

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Declaration of interests

EB is funded by CRUK (C1417/A14135). EB has received unrestricted research funding from Pfizer.

Key words

Smoking, uptake, cessation, age-period-cohort, tobacco policy

*Concise statement*

The decline in prevalence in England has resulted both from reductions in uptake and increases in cessation. These were largely driven by a strong tobacco control climate including mass media campaigns, increasing the legal age-of-sale and provision of free smoking cessation support. In order to reach a target smoking prevalence of 5% by 2030, additional funding of tobacco control initiatives is needed.

Cigarette smoking remains a leading preventable cause of early death and disability worldwide [1]. The prevalence of cigarette smoking has declined considerably in England from its peak in the 1970s, but the decline has not been linear. The 1990s saw a period of stagnation in decline in smoking prevalence, but from around 2000 onwards, when the sea change in tobacco control activity occurred, progress in reducing smoking prevalence was reinitiated [2]<sup>2</sup>. This included bans on tobacco marketing, mass media campaigns, a ban on smoking in indoor public areas, introduction of graphic health warnings on packs, increasing the legal age of sale, rises in taxation and the widespread provision of free smoking cessation support[3].

A contentious issue is whether declines in smoking prevalence have been primarily driven by lower initiation of smoking rather than increases in quitting. This would call into question the considerable investment that has been made in promoting and supporting cessation. Trend analyses in Great Britain and the US support the decline in prevalence being *both* through reduced initiation of smoking primarily among youth and increased quitting activity primarily among older age groups [2, 4]. The study by Opazo Breton et al [5] attempts to address this question using an age-period-cohort approach. This is an important study given that triangulation across multiple complementary methods helps to improve our understanding of potential causal factors [6]. The age-period-cohort approach allows for one to disentangle the differential risk of smoking associated with an individual's age from those associated with their year of birth and changes in exposure to risks over time.

The likelihood of smoking in the younger age group (aged 18 to 25), a period during which uptake usually occurs [7], decreased over time by an average of 7% across cohorts for every two years. While for older adults, a period when smoking cessation is more common, prevalence decreased on average by 5% with an upper range of 9% across cohorts for each 2 year period. In line with previous studies, this supports a role in declining prevalence of both uptake behaviour and quitting activity. As a consequence, Opazo Breton et al [5] argue for policies aimed at decreasing smoking initiation among young people to further reduce smoking prevalence. One such policy may be increasing the legal age of sale to 21. The logic being, that this makes the process of obtaining cigarettes, both through social

sources and purchase, more difficult, not just for 18-20 year olds but also younger people. There is short-term and long term evidence for the effectiveness of increasing the legal age of sale from 16 to 18 in England in 2007 [8-10]; and evidence from several US states for increasing the age of sale from 18 to 21 [11]. In the recent All Party Parliamentary report on Smoking and Health, it was estimated that increasing the age of sale to 21 in England would reduce smoking prevalence among 16-18 year olds to 2% in 2030, compared to a projection of 9.6% in 2030 without such a policy [12].

Given the larger population size among those aged 25+, the impact of increased cessation activity on smoking prevalence, although not directly assessed, is likely to be larger than for the decline in uptake. Population level time series analysis and stop smoking service data have shown the benefits of interventions aimed at helping smokers to stop. Quit success rates have been improved by several tobacco control policies, the introduction of e-cigarettes and other novel products, the provision of stop smoking services and expenditure on mass media campaigns [13-15]. In order to achieve the Government's Smokefree 2030 ambition, of smoking prevalence of less than 5%, it will be essential to implement a comprehensive tobacco control plan to help the millions of smokers (~14% of the adult population) stop. Suggestions have included the use of financial incentives for disadvantaged groups, opt out rather than opt in referrals and reducing illicit tobacco [12].

In line with the concept of triangulation, it will be important in the future to assess age-period-cohort effects for measures of uptake (e.g. ever smoking among youth) and measures of cessation. Although the majority of 18-25 year olds will be in a period of smoking initiation, attempts to stop smoking are also common [16]. The majority of studies to date have used a quit rate, which is the proportion of the adult population who have quit smoking. A preferable measure is the quit ratio, which is the proportion of ever-smokers who no longer smoke. This is a more sensitive and accurate measure as it recognises that someone who has never smoked cannot become an ex-smoker.

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