

Estimating the population impact of e-cigarettes on smoking cessation and smoking prevalence in England

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This analysis aims to estimate of how far e-cigarettes have increased or decreased the population smoking cessation rate in England. It focuses on 2014, the last year for which full data are available. Comments and corrections are welcome. Once interested parties have had a chance to comment it will be submitted for publication.

Estimation

1. At the start of 2014 there were approximately 9 million adult smokers in England (19% of 46,600,000 people aged 16+) (1)
2. The percentage of smokers in 2014 who report that they tried to stop at least once is estimated at 37.5% (3,375,000 people) (2)
3. The percentage of those who tried to quit who used an e-cigarette in 2014 is estimated at 32.0% (1,080,000 people) (2)
4. The expected long-term (1 year) success rates of an unassisted quit attempt or one using a licensed nicotine product (LNP) bought from a shop is approximately 5% (3, 4). Note that no benefit can be found for LNPs bought from a shop whereas they are associated with increased success rates when accompanied by at least some professional support.
5. Evidence from RCTs and from surveys in England indicate that using an e-cigarette on average increase the probability of success of a quit attempt by approximately 50% compared with using no aid or LNP bought from a shop (5, 6).
6. Therefore 2.5% of the smokers who used an e-cigarette in their quit attempt (27,000 people) will have succeeded who would have failed if they had used nothing or LNP bought from a shop.
7. As e-cigarette usage has increased, use of LNPs, varenicline, bupropion and specialist behavioural support has decreased (2). The decline in these methods of stopping since e-cigarettes started to become popular is approximately 10% of quit attempts which represent 3.7% of smokers in 2014 (333,000 smokers). The trajectories of the declines have not mirrored the increase in e-cigarette use so an upper estimate for the contribution of e-cigarettes to that decline is 80%, which represents 266,400 smokers (333,000*0.8).
8. Therefore the net increase in smokers using a method of stopping yielding an approximately 50% increase in long-term success is approximately 813,600 people (1,080,000-266,400). The number estimated to have quit in 2014 who would not have quit if e-cigarettes had not been available is therefore **20,340** (813,600*0.025).

Comments and caveats

1. The estimate does not take account of any effect of e-cigarettes on the incidence of quit attempts. Since e-cigarettes became popular the incidence of quit attempts has risen but the two trajectories have not tracked each other (2) so one cannot reasonably infer a causal association.
2. It has been proposed that using an e-cigarette while continuing to smoke may reduce subsequent quitting so that even if using an e-cigarette in a quit attempt increased the chances of success of that attempt the net effect of having e-cigarettes on the market has reduced quitting. However, the studies on which the claim is made could not take account of the possibility that dual e-cigarette users and smokers may have a lower pre-existing ability to stop smoking which is why they are using an e-cigarette and smoking at the same time

- (7). If the proposal were correct one would expect a reduction in population quitting rates as dual use of e-cigarettes among smokers increased, whereas in England the overall rate of smoking cessation in 2014 was higher than in any of the previous 7 years (when these started to be measured) (2).
3. It is possible that smokers who quit with the aid of an e-cigarette may be at greater risk of longer term relapse to smoking. However, it is also possible that they are at lower risk, or similar risk.
 4. The figures relate to the population as a whole, not individual smokers.
 5. No differentiation can be made between different types of e-cigarette because of lack of data.
 6. For smokers who made more than one quit attempt, the model counts the most effective method used in the past year, as indicated by (6).
 7. These data solely relate to smoking cessation, not uptake. The growth in popularity of e-cigarettes has not been associated with any evident slowing of the reduction in smoking prevalence among adolescents or young adults (8).

Sources

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