

The established evidence on the effectiveness of e-cigarettes as a smoking cessation treatment

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There are three sources of evidence relevant for assessing whether e-cigarettes help smokers quit.

1. Cohort surveys.

These can have several formats, some more informative than others.

a) One relevant paradigm is asking smokers who made a serious quit attempt, about aids they used at this quit attempt, and whether they quit or are still smoking. Two such studies used different waves of the US Path study (1,2). Both found e-cigarettes (EC) to be the most widely used quitting method, and the only method that increased the probability of cigarette abstinence. A UK study, asking some 6,000 smokers who made a serious quit attempt during the last year, what methods they used, and whether they quit. This also found the highest quit rates in those who used EC (3). Data from the UK stop-smoking services show consistently, over a number of years, the highest quit rates in clients using EC (4).

These results suggest that EC are an effective stop-smoking aid, but they need to be interpreted with caution, because different types of smokers may be selecting different aids.

b) There are two other paradigms that are less informative. One monitors smokers who were unable to quit with EC but became dual users; and compares their quit outcomes with smokers attempting to quit in other ways. This usually finds lower quit rates in the dual users sample, because successful quitters have been removed at baseline (5). The other obviously biased approach is to follow-up participants from completed smoking cessation trials of other methods than EC, for an additional period of time, and look at EC use among long-term quitters vs long-term failures (e.g. 6). The problem here is that the large majority of long-term abstainers are those who quit during the original trial, and who therefore have little need to try additional aids. EC are tried predominantly by treatment failures, which makes EC use seem to be associated with failure to quit. Indeed, when only participants who did not stop smoking with the initial treatment are included, the association disappears (7).

c) Another approach is to ask a representative sample of ex-smokers which quit method they used, if any. This is relevant for assessing the potential of different methods to have a population impact. I am aware of only one such data set, Eurobarometer, the EU-wide survey (8). This reports that 6% of ex-smokers in the EU stopped smoking with the help of EC, compared to 7% who quit with all the licensed stop-smoking medications combined. The finding that EC helped more smokers than any single stop-smoking medication is remarkable, because the medications have been available for much longer, and have been widely promoted.

d) In a comparison of nationally representative US samples across several years, EC availability and use was associated with an increase in smoking cessation at the population level (9).

2. Population data on links between smoking and vaping and between sales of cigarettes and e-cigarettes.

This type of data will eventually provide the strongest evidence on whether or not vaping is replacing smoking. Reviewing existing data is beyond the scope of this brief submission, but to provide a brief summary: Although existing data are patchy and do not control for potential confounders, they seem to tally with much clearer data on two other alternative nicotine delivery devices, snus and heat-not-burn products, from countries that allow smokers to access them (Sweden and Japan). Increased use is associated with a decline in smoking and in cigarettes sales.

3. Randomised controlled trials (RCTs).

RCTs normally concern a scenario where EC are offered proactively to smokers seeking help. Obtaining EC from health professionals is not the most common way EC are used by smokers, or the most effective way to reduce smoking in the population. However, RCTs can provide information on EC efficacy compared to the efficacy of other approaches.

The recent Cochrane review (10) identified four RCTs that provided long-term biochemically validated outcomes and were rated at low risk of bias; and a number of other RCTs that have contributed some data. Unsurprisingly, EC with nicotine were shown to be more effective than EC without nicotine (over 130 RCTs exist showing nicotine replacement treatments (NRT) are more effective than placebo (11)). EC were also more effective than the licensed types of NRT. The finding was rated as moderate-certainty evidence, because of the small number of eligible trials.

In summary, triangulating the three different sources of relevant data provides converging evidence that e-cigarettes are helping smokers to quit.

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