CASAA ecig survey results

Posted on <u>4 January 2016</u> by <u>Carl V Phillips</u> | <u>18 Comments</u>

by Carl V Phillips

At the end of 2015, CASAA conducted a survey of e-cigarette use, targeted at CASAA members who are adult U.S. residents. The survey was designed primarily to provide information relevant to evaluating FDA's proposed "regulation" (i.e., ban) of e-cigarettes. We reported some of the results in <u>our report to OIRA</u> regarding the proposed regulation. What follows here is a bit more detail.

<u>Methodology and numbers of observations</u>

The survey was conducted in November and December of 2015. It was a self-administered online survey that took approximately five to ten minutes to complete. The target population was adults living in the United States who are CASAA members. CASAA membership was approximately 120,000 at the time of the survey. We were able to directly contact approximately 77,000 members via email (the others did not opt in for receiving emails from CASAA) to invite them to participate. An initial invitation and two reminders were sent via email, as well as two additional reminders to those who did not open one of the other rounds of emails.

A (different) collector link was also shared via CASAA social media to attempt to reach members who did not receive the email. The target population was clearly stated in these communications, but others could respond to the invitations and were allowed to take the survey.

A total of 27,343 subjects completed the survey. Of those, 20,454 indicated they were CASAA members. After excluding the CASAA members who indicated they do not live in the USA and a few who indicated they were under 18, a target population of 20,162 observations remained, 18,214 of whom indicated they received the email invitation.

Of the target population, 106 had never been e-cigarette users, as defined by not having spent a total of $100 on e-cigarette products for personal use. (All CASAA members were encouraged to

participate, regardless of e-cigarette use status.) No further substantive questions were asked of this subgroup. Of those remaining, 238 indicated that they were not currently regular e-cigarette users, as defined by not having used an e-cigarette on 10 occasions in the last week. They were asked just two substantive questions. (These screening questions were both piloted, and it was clear that the target audience had no difficulty answering them.)

The statistics presented here are for the remaining 19,823 regular current users among the target population. Analysis of the 238 and comparisons of results for the excluded subpopulations are not included in the interests of parsimony. There were multiple branches for part of the survey, based on reported smoking and smoking cessation history.

Note that I am not going to waste time with the busy-work of reporting confidence intervals. Anyone who understands what they mean will know that for a sample of 20K that is undoubtedly a somewhat biased sample of the target population, such reporting falls somewhere between useless and misleading. More substantively, I have not manually parsed the "other" open-ended answers to recode responses that really belong in one of the set categories, and there definitely are some of those. I will leave that, deciding what to do with the (seemingly few) incompatible answer patterns, and also comparing the excluded subpopulations, as exercises for others (see final paragraph of this post).

Description of the study population

Because this survey targeted the CASAA membership, it is the best-defined population of any survey of e-cigarette users to date, other than a few population representative surveys that have included only a couple of basic questions about e-cigarette use. Most previous surveys lacked clearly-defined target populations; they recruited respondents via untargeted social media snowballing, and thus collected a convenience sample of responses. I am aware of only two published surveys that were based on a better defined population, customers of a particular company — one by my research group (the first published survey of e-cigarette users) and one by Siegel et al. — but both of those had such low response rates that they were effectively convenience samples. The response rates for this

survey is still low enough (17% of all members; 23% of those on our email list) that we should assume there is nontrivial selection bias, based on level of social networking enthusiasm about taking surveys. But this is still far better than the <1% response rate from eligible respondents from all previous surveys targeted at e-cigarette users.

CASAA members who use e-cigarettes are clearly not representative of all U.S. e-cigarette users, given that they self-selected to participate in CASAA Calls to Action (advocacy alerts) or were otherwise interested in joining the organization. We believe the results are reasonably representative of 1 million, perhaps as many as 2 million, who are actively enthusiastic about e-cigarettes, though some results will represent the perhaps 5 million other dedicated e-cigarette users in the USA. In particular, the responses indicate a much larger portion of survey population quit smoking entirely, as compared to all e-cigarette users. However, stratified on the resulting subpopulations — those who quit entirely using e-cigarettes and those who merely reduced their smoking — the responses are probably reasonably representative of the larger population. [Update: I have rethought this a bit. While those who quit entirely are probably representative of the larger population of enthusiasts who quit entirely, but it is not clear exactly who those who still smoke represent. See UPDATE 1, below, for more on this.]   The responses to the questions about planned actions in the event of bans are probably only representative of the enthusiast population, given that plans to seek alternative markets requires knowledge and social connections in the e-cigarette space.

Respondents were overwhelmingly open system users, with 97% reporting that is what they primarily use and another 1% using them sometime in the last month. 10% reported that they used disposables in the last month, and 14% had used rechargeable cartridge systems.

Respondents were 75% male. 14% were age 18-25, 30% 26-35, 44% 36-55, and 12% over 55.

<u>Smoking history</u>

87% indicated they quit smoking (entirely) after starting to use e-cigarettes. 5% still smoked sometimes. 3% had already quit smoking before starting to use e-cigarettes. The others were divided

among 3% who had never been regular smokers (defined based on smoking an average of more than one cigarette per day on most days for at least a year, which is a narrower, and more meaningful, measure of having been a smoker than is typically used), 3% who gave an "other" answer, and a few who did not answer. (As noted above, this should be considered as describing the study population, rather than being a result about a larger population. This is a far higher rate of complete smoking cessation than among all e-cigarette users or even among dedicated e-cigarette users.)

Almost everyone reported previous attempts to quit smoking, with only 6% reporting no attempts before they started using e-cigarettes.

- 71% had tried to quit using NRT,
- 41% using some other pharmaceutical (e.g., Chantix),
- 21% had tried formal counseling,
- 21% had tried calling a quitline,
- 81% had tried unaided quitting,
- 8% volunteered some other method they tried.

Of the five specific methods (NRT, other pharmaceuticals, counseling, quitline, unaided), 8% had tried all five, 21% had tried 4 or 5, and 46% had tried at least three.

When this analysis is restricted to those who quit completely with e-cigarettes, all of the rates for quit methods increase (i.e., those who ultimately quit had been rather more intent on quitting before using e-cigarettes; keep in mind they were already 87% of the study population). The numbers are 75% for NRT, 43% for other pharmaceuticals, 24% for counseling, 24% for quitlines, 85% for unaided, and 8% for other.

For the 980 respondents who indicated that they still smoke,

- 34% reported less than one cigarette per day on average,
- 42% smoke one to five per day,
- and 23% more than 5.

The remainder declined to answer.

51% of those who had not quit smoking entirely credited e-cigarettes with helping them almost quit smoking and another 44% credited e-cigarettes with helping them smoke a lot less. Only 3% indicated they use e-cigarettes as a partial substitute but still smoke almost as much as they used to, with almost none saying they smoke fully as much as they used to. A few (1%) indicated they both reduced their smoking, but do not credit that to e-cigarettes.

Of the 565 respondents who quit smoking before taking up e-cigarettes,

- 48% indicated they were concerned they would start smoking again and so sought a substitute,
- 31% did not predict they would start smoking again but missed it and started using e-cigarettes because of that,
- 21% chose neither of these (they gave an open-ended answer).

Of the 17,186 respondents who quit smoking using e-cigarettes,

- 64% indicated they switched almost immediately, within a few days of starting e-cigarettes,
- 21% used both for longer than that but quit smoking within a month,
- 11% used both for between one and six months before quitting smoking,
- 3% for more than six months.

(Note that this might be best interpreted as a descriptive statistic for the study population rather than a result, *per se*. It seems to represent a faster average switching trajectory than we believe is average for the population overall.)

When asked about the role e-cigarettes played in their smoking cessation,

- 64% said they started using e-cigarettes with the intention of quitting smoking,
- 25% started with the intention of merely reducing their smoking but ended up switching entirely,
- 11% started using e-cigarettes without the intention of quitting or reducing smoking, but ended up switching entirely.

Only a handful indicated they did not credit e-cigarettes with their successful smoking cessation.

99% indicated they believe they would still be a smoker were it not for e-cigarettes.

Role of flavors

Returning to the full population under consideration here, the percentage reporting using particular flavor categories regularly (defined as at least sometimes in a typical month) were:

- tobacco 19%;
- menthol/mint 18%;
- fruit or fruit beverage 83%;
- candy, soda, or pastry 76%;
- spice or savory (e.g., cinnamon, clove, pepper) 30%;
- bitter (e.g., unsweetened coffee, whiskey) 12%.

When asked about how often they choose sweet (fruit, candy, pastry, soda) flavors, 78% indicated that is what they used most or all the time (18% always, 35% almost always, 26% most of the time), with 14% using them some of the time and 7% rarely or never.

This contrasts with the proportions choosing tobacco or menthol flavors, with 48% saying never, 25% rarely, 14% some of the time, and only 11% most or all the time. 31% said they started out using tobacco or menthol flavors but now always or almost always use other flavors.

Of those who quit smoking entirely, 72% credit interesting flavors with helping them quit. Of those who still smoke, 53% say interesting flavors are helping move them toward quitting entirely.

Only 4% indicated that they do not care much about flavors and will use anything or whatever is cheapest. 43% said they use five or fewer flavors in a typical month, while 28% said they use over twenty in a typical month.

Medical advice

Subjects were asked about advice they had received from a healthcare provider about e-cigarettes, excluding counselors specifically consulted about smoking cessation. (This question was motivated by OIRA previously indicating an interest.) 35% indicated they had never talked to a healthcare provider about e-cigarettes. Of the remaining 65%, the proportions received the following bits of advice from one or more providers were (if they received different advice from different providers, they were instructed to indicate all that apply):

- a provider got the subject interested in e-cigarettes in the first place, 10%;
- a provider volunteered a recommendation to try e-cigarettes, though the subject was already using them or considering it, 10%;
- subject told the provider about his/her e-cigarette use and the provider encouraged continuing, 66%;
- subject told the provider who discouraged continuing, 5%;
- subject told the provider and got a neutral response, 26%;
- a provider told the subject that e-cigarettes are low-risk, 34%;
- a provider told the subject that e-cigarettes pose high risk 3%.

Response to FDA ban scenarios

Subjects were asked about what they would do under three different scenarios under which e-cigarettes were totally or partially banned. These were described as being plausible scenarios for the USA, though no further details were mentioned. Most respondents presumably knew that if one of these happened, it would be due to FDA action. The first scenario is unlikely, but not impossible. The second is what is predicted to occur under FDA "deeming" after a grace period. The third has been rumored to be FDA's intention to implement immediately, before the grace period expires.

Under the first scenario, e-cigarette sales would be completely banned. For this and the other scenarios, it was made clear that possession and use would still be legal, and the ban would only affect sales. Subjects were instructed to indicate all that applied if they believed they would respond with more than one of those on the list. Subjects indicated they would respond to that ban as follows:

- quit using e-cigarettes and all tobacco/nicotine products, 5%;
- start smoking or increase how much I now smoke, 21% of those who had quit entirely, 50% of those who still smoked;

- start using some other smoke-free tobacco/nicotine product (e.g., snus / smokeless tobacco; NRT) or increase my current use of those products, 4%;
- continue to use e-cigarettes, getting products and supplies (e.g., e-liquid) from overseas or the domestic black market and/or by making them myself, 93%.

The second scenario was a ban of all products except for a small variety of closed-system cigalikes, which would only come in tobacco and menthol flavors. It was noted that these would be more expensive than current cigalikes. The responses were:

- this would not affect me because I currently only use cigalikes that are tobacco or menthol flavored, 1%;
- use the cigalike products that could be sold legally, 4% (note that this should be a superset of the previous 1%);
- quit using e-cigarettes and all tobacco/nicotine products, 6%,
- start smoking or increase how much I now smoke, 21% of quitters, 46% of those who still smoke;
- start using some other smoke-free tobacco/nicotine product (e.g., snus / smokeless tobacco; NRT) or increase my current use of those products, 4%;
- Continue to use my preferred type of e-cigarettes, getting products and supplies (e.g., e-liquid) from overseas or the domestic black market and/or by making them myself, 91%.

The third scenario was that all types of e-cigarette hardware would still be available (cigalikes and open systems), but all e-cigarettes and e-liquid sold could only be tobacco or menthol flavored. The responses were:

- this would not affect me because I currently only use tobacco or menthol flavors, 4%;
- switch to using only tobacco or menthol flavors, 10% (which includes some of the previous 4%, though the wording makes this a bit ambiguous);
- quit using e-cigarettes and all tobacco/nicotine products, 5%;
- start smoking or increase how much I now smoke, 14% of quitters, 35% of those who still smoke;
- start using some other smoke-free tobacco/nicotine product (e.g., snus / smokeless tobacco; NRT) or increase my current use of those products, 3%;
- Continue to use my preferred flavors of e-cigarettes, getting e-liquid (or flavored cigalikes) from overseas or the domestic black market and/or by making or flavoring e-liquid myself, 89%.

Discussion

It is worth noting that even without extrapolating the results to the larger population, this survey population includes 17,000 Americans who attribute their successful smoking cessation to e-cigarettes. If we estimate e-cigarettes to post about 1/100th the health risk of smoking, the net population health benefits would only be offset if most of 2 million non-users became regular users of e-cigarettes, far more than have done so (and that is ignoring the net consumption benefits, which would necessarily be positive for those who choose to become new users). If we extrapolate that to the larger population it represents, we get close to requiring every single American take up e-cigarettes to offset the health benefit alone.

The results about NRT — the large percentage of those who quit with e-cigarettes who had failed to quit with NRT, as well as the lack of interest in switching to any smoke-free alternative under the ban scenarios — starkly illustrate the failure of those products. The reasons these theoretically similar products vary so hugely in terms of actual quality are widely discussed, but it would be interesting to conduct some more organized survey research on that point.

The results about flavors are simply another confirmation of what everyone with any expertise has known for years: The "proper" e-cigarette users (adults who used or are using them to quit smoking) overwhelmingly prefer and choose interesting — usually sweet — flavors, and that these flavors play a major role in smoking cessation. Choosing them is the equilibrium state for most vapers.

The responses to the ban scenario questions are the particularly useful bits of this survey. While a few other surveys have produced generally similar results, the present survey specified more concrete and plausible scenarios, and the survey population and who they represent is far better defined. About 90% of the study population — which it seems safe to extrapolate to over a million Americans — would pursue black, grey, and/or do-it-yourself markets in the event of any severe restriction on their preferred e-cigarettes. Notably, the ban of interesting flavors alone prompts almost as much interest in those options as does a total ban. Discussion surrounding this survey revealed a large portion of enthusiast vapers declaring they are personally dedicated to *being* the black market, if necessary, rather than just using it.

(Note that we considered breaking out the alternative markets into separate answers, but pilot testing suggested this was not practical. On further reflection, we concluded that a stated intention to seek alternative supply is fairly robust, but any speculation about how that would be done — not knowing how the alternative markets would evolve — would be unsubstantiated speculation.)

Even as most respondents indicate they would simply defy the bans, their responses suggest such bans would also cause a dramatic increase in their smoking. This effect alone would dwarf any supposed benefits of the bans. Very few respondents indicated a willingness to choose one of the options that they are "supposed to do" (as defined by ban proponents).

Policy recommendations

Wait, you think I would suggest that a single study's results, absent any analysis of the ethics or effects of actual policies, are sufficient to recommend a particular policy? Do I look like a "public health" "researcher"?

But seriously, see our OIRA report, in which I do the policy analysis. Most notably it points out the implications of alternative markets, which this survey confirms are inevitable. They would be robust but far inferior to the *status quo* in every way. The result would be that the proposed FDA bans will accomplish literally none of their goals and will set many of them back. Neither FDA nor any other proponents of bans have ever admitted, let alone serious analyzed, what will really happen.

Further analysis

If anyone would like to suggest any further analyses of the data (crosstabs or whatever) that seem particularly interesting, please mention them in the comments. I will see what I can do. All of the questions asked in the survey are represented in the reporting above.

We will be making the data, detailed methods (i.e., exact survey instrument and all notes about its development), and the R code I used for the above available to external researchers who want to turn it into a journal paper (and to check my work! — a rarity in the world of public health research). If

you are interested, and have a history of doing honest high-quality research on or around this type of data, email me.

[UPDATE 1, 13feb16

I was asked how the flavor preferences compare between subjects who still smoke and those who have quit completely. This is indeed an interesting question, though a caveat is in order: It is difficult to figure out exactly who the still-smoker subjects represent. They are presumably e-cigarette enthusiasts and/or politically active in defending vaping rights, or else they would not be in the target population. This makes them rather different from the typical e-cigarette user who still smokes and is not highly enthusiastic or involved, which probably describes a substantial majority of U.S. e-cigarette users. Thus, while the comparison is still interesting, we should hesitate to extrapolate the results for the still-smoke group to a larger population since we are not quite sure who to extrapolate to. (Also, for what it is worth, the n for this group is small enough that random error starts to be nontrivial. However, since it is still trivial compared to the uncertain level of selection bias, I will stick with my practice of avoiding providing information that is more likely to mislead than inform, rather than blindly following convention, and so still will not report CIs.)

Here is the crosstab for the flavor questions by smoking status. See above for details about the questions. I decided to go ahead and include the third category, those who had already quit smoking before starting to use e-cigarettes. Results are percentages for the particular subgroup, as above.

	Quit with ecigs n=17,186	Still smoke n=980	Quit pre-eicgs n=565
Use flavor regularly			
tobacco	19	26	17
menthol/mint	18	22	19
fruit or fruit beverage	83	80	80
candy, soda, pastry	76	69	72
spice or savory	30	28	27
bitter	12	12	10
How often sweet			
all I ever use	19	10	18
almost always	35	31	31
most of the time	25	30	26
some of the time	14	17	16
rarely	4	6	4
never	3	6	4
How often tob/menthol			
all I ever use	3	4	2
almost always	4	6	5
most of the time	4	6	4
some of the time	14	18	13
rarely	25	30	30
never	49	35	48

As expected, those who still smoke have a greater prevalence of using cigarette-like flavors. However, the difference is more modest than might be expected. This indicates that the still-smokers in the e-cigarette enthusiast population are not representative of all e-cigarette users who still smoke, given the substantial market share of tobacco and menthol flavored products.

In terms of regularly using the flavors, still-smokers are more likely to have tobacco flavors in their rotation and less likely to have sweet flavors, but not by all that much. The greatest contrasts are that those who still smoke are much less likely to use sweet flavors exclusively and much less likely to never use tobacco/menthol flavors (though note that they are more likely to use them rarely, so the real difference is not as great as it might appear from the "never" statistics alone). Those who quit smoking before starting e-cigarettes are quite similar to those who quit entirely using e-cigarettes.

end update]