truth initiative
INSPIRING TOBACCO-FREE LIVES

900 G Street, NW
Fourth Floor
Washington, DC 20001

truthinitiative.org
202 454 5555

January 4, 2018

Caryn Cohen
Office of Science
Center for Tobacco Products
Food and Drug Administration
Document Control Center
Bldg. 71, Rm. G335
10903 New Hampshire Ave.
Silver Spring, MD 20993–0002

Re: Docket No. FDA-2017-D-3001

Dear Ms. Cohen:

Truth Initiative appreciates the opportunity to comment on the Modified Risk Tobacco Product application (and Premarket Tobacco Product Application) submitted by Philip Morris Products SA for its "tobacco heating system" known as iQOS and the Marlboro branded "HeatSticks" used with the iQOS device. Philip Morris Products SA is a subsidiary of Philip Morris International and throughout these comments we referred to them collectively as "PMI". Further, we often use "iQOS" to refer to both the iQOS device, as well as HeatStick consumption, unless otherwise indicated.

I. Introduction

Section 911 of the Federal Food, Drug and Cosmetic Act as modified by the Family Smoking Prevention and Tobacco Control Act (Tobacco Control Act), prohibits tobacco product manufacturers from making health claims about a product without prior review and approval from the FDA.[1] This was to prevent a repeat of the public health debacle caused by "light" and "low tar" cigarettes that were marketed as, and were widely believed to be, reduced harm alternatives to "regular" cigarettes. In fact, light cigarettes, as was known by the tobacco industry, were more harmful.[2] Indeed, Congress noted in the findings section of the Tobacco Control Act, that "permitting manufacturers to make unsubstantiated statements concerning modified risk tobacco products…even if accompanied by disclaimers would be detrimental to the public health."[3] However, Congress also recognized that given the incredible harms caused by tobacco use, and cigarettes in particular, it should be possible to develop substantially lower risk tobacco products and that such products could be beneficial to public health considered as a whole. Thus, Congress determined "the only way to effectively protect the

public health from the dangers of unsubstantiated modified risk tobacco products is to empower the FDA" to review these products
before they are allowed on the market and require manufacturers to "demonstrate that such products…meet a series of rigorous criteria, and will benefit the health of the population as a whole."[4,5]

Truth Initiative has long supported a harm minimization strategy (Appendix A).[6] In so doing, we recognize that there is a continuum of risk for tobacco products. On this continuum, cigarettes and other combustible tobacco products are the most dangerous tobacco products, and FDA-approved nicotine replacement therapies (NRTs) are the least harmful. Never using tobacco in the first place, and for those who are tobacco users, quitting all tobacco products entirely are the best ways to minimize-tobacco related harms. However, for those who cannot or will not quit smoking, switching entirely to the least harmful non-combustible products can reduce those harms.

Obviously, one essential requirement for a *bona fide* MRTP is that a manufacturer demonstrate the product will substantially reduce the risk of tobacco related-harm to an individual user. While Truth Initiative understands this is a critical issue, we do not specifically address the toxicology data or estimates of disease impact posited by PMI's application, as our internal expertise is not related to toxicology. However, we do note that other well-respected expert commenters have raised substantial concerns as to the adequacy of PMI's presentation on this issue.[7-9] The FDA should carefully investigate where independent toxicology analysis suggests there may be issues with iQOS and HeatSticks not discovered or disclosed by PMI.[*] Further, we are deeply concerned by the recent reports that there are significant irregularities with the clinical trials upon which PMI has based some of its findings.[10] We encourage FDA to thoroughly investigate these reports, and ensure that the data supporting this application is accurate and of sufficient quality in order for FDA to make a decision.

We also note agreement with PMI that "one challenge of pre-market assessment of an MRTP is that product-specific epidemiological evidence is not available, and that clinical trial data on disease outcome is limited due to the long latency of tobacco-related disease."[11] This will require the FDA to monitor health impact over the long term and for it to require PMI to disclose any adverse evidence it accumulates about health impacts over time. It will also require careful enforcement of pre-market approval rules as the product is inevitably modified over time.

Our comment focuses primarily on whether, even assuming PMI's estimates of individual harm are accurate, the PMI application sufficiently supports the potential for significant

[*] There has also been very little independent research on iQOS. Given the presence of iQOS in foreign markets, we would expect more independent research as time progresses. It would also benefit the debate if there were government-funded research on the health effects of iQOS and the HeatSticks products.

population based harm reduction. This requires sufficiently demonstrating (i) that the product is designed and marketed to encourage adult smokers who cannot or will not quit using nicotine to transition completely to the product and (ii) that the product is not designed or marketed to attract individuals who do not use nicotine including, in particular, nicotine-naïve youth. PMI's application, in our view, is presently insufficient to draw reasonable conclusions on these matters as it (i) does not consider the impact of marketing HeatSticks under the Marlboro brand, (ii) does not include important information about its marketing and media plans for iQOS, (iii) does not separately consider the potential public health impact of the menthol HeatStick variant, and (iv) as a whole, completely ignores the potential appeal of the product to youth.

Moreover, the results of PMI's Whole Offer Tests and Perception and Behavior Assessments, even taken at face value, indicate considerable barriers to substantial uptake and complete switching by smokers. This is reflected in the relatively modest impact PMI itself puts forward in Section 6.5 as part of its analysis of potential population health effects. PMI's own data show that the impact of introducing an MRTP into the United States market is unlikely to have significant impact unless accompanied by other strong policies to reduce cigarette consumption.

II. Understanding the context of the Application

In analyzing PMI's petition, it is important to keep in mind that despite its rhetoric about a desire to transform the nicotine market, the company, like all other for-profit businesses, exists to increase shareholder value. Market transformation, if it comes, will not be a result of PMI's desire to protect the public health, but rather as a *response* either to changing consumer tastes and/or environmental pressures (particularly, in this case, regulatory action to depress the demand for cigarettes). It is axiomatic that a for-profit company will continue to service (and create) demand for a product line so long as it can do so profitably.

As profit-seeking firms, we expect PMI and Altria to take actions that will maintain and/or increase their cigarette business. And, in fact, both companies reflexively oppose policies that are proven to decrease cigarette demand (such as higher taxes, flavor bans, graphic warnings, clean indoor air laws, etc.). This is widely documented, but most recently the July 2017 investigative reporting by Reuters and in the Guardian aptly demonstrates PMI's commitment to subverting regulatory interventions that suppress demand for cigarettes.[12,13] In the United States, Altria also predictably opposes or funds opposition to tax increases and other product regulations.[14] For example, the company has actively fought against San Francisco's efforts to prohibit flavored tobacco products, including menthol cigarettes.[15-17]

In this context, iQOS is best understood as a classic business strategy to diversify product lines with the goal of increasing overall market share and profit. iQOS is not just innovation due to technological breakthroughs (after all the notion of "heat not burn" products has

been around for decades), but also a response to market pressures that are a *result* of ongoing educational and policy efforts designed to reduce consumer demand for cigarettes.

The soft drink industry is a useful analogy. Faced with competition, Coca-Cola over the years has offered new packaging and advertising, new flavors, low and no calorie varieties, and now faced with a decline in the overall carbonated beverage market, Coca Cola is experimenting with other beverage offerings (i.e., its acquisition of Vitaminwater and Honest Tea). It's unlikely that Coca-Cola entered these new product lines from a sense of altruism or a desire to decrease the adverse health impacts of sugar sweetened beverages, nor is it likely that it will exit the sugar sweetened beverage market. Moreover, from Coca-Cola's standpoint, the firm is indifferent as to whether consumers switch 100% from Coke to Dasani water (clearly the healthiest choice) or whether they simply substitute only a single usage occasion of Coke to Dasani. The point is that the company is providing solutions for all consumer tastes in whatever fashion the consumer decides, regardless of better or worse health outcomes. PMI's public statements reveal a similar laissez-faire strategy. In short, it simply is trying to service consumer demand that has changed because of increasing consumer knowledge.

It is clear from PMI's public statements on iQOS and its actions, that the company wants maximum flexibility to keep its feet solidly in the combustible tobacco business while at the same time facing no additional regulatory pressure to change its business practices. Recently in response to a letter from over 120 public health groups demanding that PMI quit selling cigarettes, the company made this strategy explicit.[18] While professing that its "paramount business strategy is to replace cigarettes with less-harmful, smoke-free alternatives", PMI objected to the notion of exiting the business citing issues of consumer choice, consumer decisions and individual decision making. This, of course, entirely sidesteps the fundamental fact that PMI is in the business of selling a highly addictive product that by design constrains the choice of users to quit. It also ignores the fact that it not only opposes exiting the cigarette market as a unilateral decision, it also opposes policies designed to constrain demand for cigarettes in general.

To see where PMI's actual interests lie, one need only look to its communications with stockholders. In its 2016 Annual Report, PMI reports that it sold 812.9 billion cigarettes that year.[19] PMI's sales numbers do not include cigarettes sold in the United States by Altria, which add another 122.9 billion to that number, totaling 935.8 billion.[20] That is 123 cigarettes for every living human being on earth. For PMI, cigarette sales accounted for the vast majority of $75 billion in net revenues. PMI's 2016 Annual report goes on to laud the company's success in the "widespread market share growth" of its Marlboro branded cigarettes.[21] While the report does cite success in growing the iQOS and HeatStick market (7.4 billion HeatSticks sold), it is clear where the company's future lies in the short- to mid-term, and it admits as much in its response to the public health groups citing its aspiration that "we expect that by 2025, at least 40 million men and women, representing about 30% of PMI's current cigarette consumers will have switched from smoking to one of our

smoke-free products."[18] Notably this is not *actual* PMI customers converted, but rather a growth aspiration. While the company casts this in a positive public health light, it unsurprisingly, would rather grow (or keep) its base of cigarette customers and *add* new customers from competitors or new users. Analysts are bullish seeing iQOS as an opportunity to "increase overall consumption." (Appendix B) and to "acquire new consumers and establish a loyal customer base." (Appendix C).

III. Marketing and Advertising Concerns Raised by the Application

A. FDA Should Consider the Impact of Marketing HeatSticks under the Marlboro Brand Name

Our concerns regarding the marketing of HeatSticks under the Marlboro brand come not only from PMI's clear market expansion aspirations noted above, but also in how powerful the Marlboro brand name is and how attractive it can be not only to smokers, but to youth and young adults who are not smokers. Marlboro is one of the most recognizable brands in the country and around the world. It was listed as one of the top 10 brands of 2016, along with household names like Apple, Google, Visa, CocaCola, Verizon and AT&T.[22] Further, youth and young adults have consistently listed Marlboro as the most recognizable cigarette brand.[23,24] PMI's own research in its Perceptions and Behaviors Assessment as reported in the Potential Label, Labeling and Marketing Material Report, which assessed marketing and advertising materials of iQOS and HeatSticks, found that Marlboro was considered a good fit for the HeatSticks. Indeed, when given two different examples of potential ads for iQOS, one with Marlboro branded HeatSticks in the picture, and one without Marlboro branding, participants noted that it was important to have Marlboro branding in order "to raise the interest" in the product, particularly among "adult current smokers".[25] However, the study fails to examine whether use of the brand also "raises interest" among youth.†

Additionally, the assertions from PMI throughout this study[26] that ads which "involve the use of a tobacco product" or contain the word "tobacco", "makes it clear that the intended users of the iQOS system are adult current smokers" is not supported by any evidence. Moreover, these assertions contradict a large body of evidence that tobacco advertising generally, and cigarette advertising in particular, attracts youth and young adult non-smokers.[23,27-30] Those ads all contain either tobacco imagery or the word "cigarette" or

† As PMI notes, a tobacco company testing messaging on youth does raise substantial ethical concerns. However, if the product is in the market, youth will inevitably be exposed to packaging and advertising. It would be preferable for the FDA to conduct or sponsor independent research on youth appeal, but a complete absence of data complicates the ability to evaluate the impact of the product on non-users. This is particularly true as a substantial majority of life-long cigarette users started as adolescents. We also see that youth are attracted to new nicotine products with last thirty-day prevalence of e-cigarette use exceeding last thirty-day prevalence of cigarettes in all national surveillance instruments.

"tobacco" as well. The iQOS and HeatStick ads were considered by study participants to also be "sleek," "sophisticated", and "James Bond-ish."[31] These same elements are also included in cigarette advertising, and listed as reasons for appealing to youth and young adults.[27] Indeed, the study itself notes that these descriptions are "consistent with Marlboro branding."

While it is possible that this branding might inspire Marlboro cigarette users to switch,‡ it is also equally plausible that the use of the brand will increase overall appeal of all Marlboro branded products, *including cigarettes*. Indeed, this is the usual strategy behind co-branding, and is typical of companies looking to build market share across brand portfolios as seen in the soft drink, alcoholic beverage and snack industries (e.g., Coca Cola, Budweiser, Doritos, etc.). As noted above, PMI's public statements show that it is interested in increasing its *overall* nicotine delivery market, and this is consistent with PMI's international marketing efforts such as its "Be Marlboro" campaign, that featured youth and young adult "lifestyle" marketing.[32] PMI should be required to test the impact of Marlboro branded HeatStick advertising on perceptions of and attitudes toward and willingness to try any Marlboro branded product and in particular Marlboro branded cigarettes, particularly amongst youth and young adults.

B. FDA Should Require More Data with Regard to PMI's Marketing Plans for iQOS

Section 4 of PMI's application covers the proposed labeling and advertising of iQOS and HeatSticks. In Truth Initiative's view, the information provided is too limited to allow the FDA to adequately evaluate PMI's application and assertions of population based harm reduction.§

First, the PMI application contains no data on how its promotional materials might impact youth perceptions and initiation. As noted elsewhere, the content of the promotional materials should be tested to make sure they do not appeal to youth. Moreover, the FDA

‡ To the extent that the FDA determines iQOS to be a *bona fide* reduced risk product, the co-branding strategy also raises the concern that it might discourage smokers of non-Marlboro branded cigarettes from switching completely.

§ In Section 6.4 of its application, PMI primarily studies consumer comprehension of its proposed reduced harm messaging. A primary concern here is not only that consumers understand the communication, but that the information being conveyed is true. As noted earlier, we have not done any review of the toxicology reports, so we cannot verify that the data provided by PMI to support its reduced harm messaging is factual. We note, however, that even assuming PMI's toxicology data supports its proposed messaging, it is critical that *any* communication for *any bona fide* reduced harm product emphasize the necessity for complete switching to the reduced harm product to receive substantial benefit. As we discuss in detail below, PMI's own data demonstrate that dual use remains a significant concern with large majorities of iQOS users in foreign test markets and in its United States actual use study adopting dual use patterns. This is a concern that also is critical in evaluating PMI's marketing plans.

should see PMI's media plans to verify that promotional materials will not be disseminated through channels with significant youth audiences. PMI should also be required to release any data it has on youth use of iQOS in the many markets where it has already begun sales of the product. Nicotine products have no place for youth and particularly youth non-smokers. This is an important component of approving any MRTP application, and particularly one sponsored by the leading seller of cigarettes in the country with a decades long record of inappropriately promoting its product to youth audiences.

Second, other than mock ups of a proposed brochure and direct mail piece, the application does not include other advertising concepts. The provided examples include imagery of young adult models using the device in a variety of situations either in groups or individually. While the application contains some testing of brochures, packages, and advertisements[26], the photos and other elements tested in that study are not the same as the examples submitted in Module 4 of its application. If PMI has followed standard marketing practices, it has tested consumer reaction to these mockups, and should include that data along with its application as the context of messaging can have a substantial impact on its interpretation. Of particular interest would be the impact of the imagery on youth and young adult non-smokers. PMI represents that the "draft promotional materials contain photography that shows the product in situation, in a variety of set-ups, and that constitutes the type of imagery to be used for the brand campaign."[33] Provided that PMI can show its promotional materials do not increase youth appeal of the product, it should not be allowed to materially change the imagery related to the products without backup study provided to the FDA that the imagery does not enhance youth appeal.

Third, as noted above, the Marlboro branding of HeatSticks prevents a rigorous evaluation of the impact of the marketing and promotion of this product. PMI has used "Marlboro" as a master brand for a variety of products, presumably under the theory that this branding architecture provides a halo-effect and thereby increases overall market for all of its tobacco products. If the HeatSticks are branded Marlboro in the United States, the FDA needs to understand where they will fit in the entire brand architecture. For example, if PMI / Altria adopts a "Be Marlboro" approach in the United States, it will be important to understand how the company relates HeatSticks to its overall product line in order to evaluate its contention that the product is only being marketed to adult smokers. It is possible that Marlboro HeatStick advertising will also serve the purpose of promoting *all* PMI / Altria Marlboro products, including cigarettes, and this appears to be the expectation of investors. At minimum, it is difficult to ignore that this co-branding will bring attention to the Marlboro brand and Marlboro cigarettes allowing Altria to bring publicity to a brand that, while the leader in the US cigarette market, has seen volumes shrink along with the rest of the cigarette market in the United States. Specifically Marlboro has lost volume shares in recent months, and this co-branding could help boost the brand.[34]

Fourth, PMI, while generally describing media it might use for promotional activity[35], only gives examples of potential media channels, not an exclusive list. PMI should be required

to demonstrate that it is using only media channels with minimal youth audience (both on an absolute and relative composition basis). Further, PMI should give FDA information as to how it plans to reach adult smokers. As the FDA is certainly aware from running its own advertising efforts, media purchasing is quite sophisticated, and PMI will certainly develop a media plan for product launch, and likely has draft plans already. Those plans should be shared with FDA to demonstrate low level of youth exposure to promotional material. This is particularly important as PMI may choose to advertise iQOS on television, streaming video, digital and social media platforms that have broad appeal to youth.

The other concern with a lack of a media plan for review is it inhibits the FDA's ability to evaluate the veracity of PMI's stated intent to "drive conversion among adult smokers."[36]. We know that while there have been major gains in driving down the rate of cigarette smoking in the United States, those gains have not been equally distributed. As Truth Initiative's *Tobacco Nation* report demonstrates, some areas of the country continue to have relatively high rates of tobacco use.[37] To the extent that iQOS is a *bona* fide reduced risk product that is promoted for complete switching, it will be important for PMI / Altria to develop marketing materials and media plans to reach those most at risk. Without a media plan, it is hard to understand PMI's marketing intent. This is also an issue with the draft promotional materials, with imagery focusing on young professionals. This may discourage older and lower-income smokers in suburban and rural areas from switching. At the same time, the relative lack of diversity in the photos, particularly of the models shown using the product, may discourage people of color from switching to this product.[38-42]

Lastly, we note that pricing may also be a concern here. As highlighted elsewhere in these comments, PMI's research showed that there was a significant lack of intent to purchase or use the product, some of which may be connected to the price point. For example, during Actual Use studies PMI conducted, the iQOS device and the HeatSticks were provided for free to paid study participants. When asked if they would buy IQOS on their own, a full 60% of the full FAS said probably not or no. Even among those who were considered to be using HeatSticks by the end of the study period, less than half said they definitely or probably would and one third said they probably or definitely would not.[43] Further, the application included one study reviewing the marketing materials[26], where it was revealed that "almost no study participant, regardless of how highly they value the benefits of the iQOS system" indicated that they were likely to use iQOS regularly in the future "at the hypothetical price tested as part of the study of $80."[31] While it is true that in that study, participants did not actually try iQOS, the high price point was clearly an issue, even before trying the product. We know that smoking is concentrated in lower socioeconomic status individuals.[30,44] PMI has not shared any data on how its pricing structure for the iQOS device might impact switching behavior in these demographics.

While we believe further data on the above issues is needed to assist the FDA in evaluating PMI's application, it will be critical for the FDA to also sponsor independent post-market surveillance of the product. This should include not only monitoring patterns of use through population based surveys such as PATH, but also monitoring of adverse

event reporting, longitudinal studies of health impacts of the product, and continuing surveillance of how the product is actually being promoted in the market place. While we do not take the position that a tobacco company cannot credibly introduce a modified risk tobacco product, it is important to carefully monitor an entity such as PMI that has a long record of fraudulent behavior and strong economic incentives to maintain its market position as a leader in combustible cigarettes.

C. FDA should require PMI to study the Appeal of Menthol HeatSticks

PMI's application does not call out the potential population wide impact of the menthol HeatSticks variant. We note that FDA itself made a non-substantial equivalence determination for certain products because, among other things, FDA noted that the differing levels of menthol in the predicate product and the applicant product raise different questions of public health.[45] While this is not a substantial equivalence application, the same principle should apply and PMI should show how presence of menthol and the different levels of menthol in the HeatSticks affects the appeal, toxicology and other health effects of the product. Truth Initiative has been consistent in its position on menthol cigarettes – there is more than ample scientific evidence to support the ban of menthol as a characterizing flavor in cigarettes under the public health standard. This was the conclusion of the Tobacco Products Scientific Advisory Committee (TPSAC) in 2011 and the conclusion of FDA's own peer-reviewed study of the subject in 2013. We submitted comments in support of a menthol ban in cigarettes in response to the FDA's ANPRM on the issue in November 2013 (Appendix D), and since then the evidence keeps mounting. A Truth Initiative Schroeder Institute study of menthol studies from 2013 through 2016 recently published finds more consistent evidence that menthol is associated with youth initiation, increased cigarette dependence, and poor cessation results (Appendix E). It has been over six years since the initial TPSAC report and over four years since the FDA's initial ANPRM on this subject. We continue to deplore the continuing delays on this incredibly important issue.

Likewise, Truth Initiative's position on *all* flavored non-combustible products has been consistent. In considering a new tobacco product pre-market approval or a modified risk tobacco product marketing order, a flavor should only be allowed if the applicant shows that the flavored product helps smokers completely switch from combustible tobacco to the harm-minimized product AND that it does not appeal to or attract youth (verified with careful post-market surveillance of actual usage patterns). We emphasize that the burden of proof for these measures lies with the applicant. The PMI application does not address the issue of youth initiation in its public health impact analyses. This is particularly troubling in the case of its menthol variant given menthol's known role as a starter product for youth.[46] In any event, the application makes no effort to consider the particular risks of menthol on the public health impact of iQOS, and this is a substantial deficiency. The FDA should require PMI to study the appeal of the menthol product to non-nicotine users (particularly youth), those considering quitting, and the impact of menthol on complete switching.

The issue is complicated by the FDA's failure to act on menthol. So long as the menthol cigarette remains on the market, the agency continues to allow what is clearly the most harmful flavored product both in terms of toxicity and public health impact to be marketed freely throughout the country. In this environment, manufacturers argue that any lesser harm menthol product should automatically be approved. This effectively sets the menthol cigarette as the consumer safety standard for all menthol products going forward, and that is clearly absurd. This is yet another reason why the FDA should act quickly on the issue of menthol cigarettes.

IV. PMI's Whole Offer Test and Actual Use Data Show Limited Evidence Supporting Population Health Benefits in the United States

PMI's data on "real world" impact of iQOS in the market comes from foreign test market studies as noted in its Whole Offer Test, Module 7.3.3, as well as its Actual Use study of US users.[47] PMI argues this data show that iQOS has the potential to transition smokers transition from cigarette use to iQOS use. Taken at face value, however, these studies demonstrate that dual use and smoker acceptance of iQOS remain substantial barriers to recognizing population based gains.

We also note with concern that what PMI considers "switching" from cigarettes to iQOS does NOT mean that someone is exclusively using iQOS. PMI considers those who used iQOS for 70% of their total tobacco use as "switched." Truth Initiative does not believe that harm reduction can be realized with any continued use of combustible tobacco products – let alone 30% of total tobacco use. We put the word switch or switching in quotes when we refer to PMI's use of the word. Likewise, and equally concerning, PMI considers "exclusive" use of iQOS to use of iQOS for 95% or more of total tobacco use. We put the word exclusive in quotes when we refer to PMI's use of the word.

A. iQOS Performance Has Varied Considerably by Test Market, and Has Shown Limited Impact on Complete Switching.

PMI offers consumer response data from non-US test markets as part of module 7.3.3 its "Analysis of Whole Offer Test Data." This analysis reports on studies conducted of iQOS user self-reported product usage recorded via a pen and pencil diary.[48] As PMI notes, this data is subject to limitations in that (i) the product was provided for free and (ii) consumers who self-identified as uninterested in purchasing iQOS were excluded from the study. Truth Initiative also offers the following observations:

First, it is clear from the data that there are factors, even among the population studied, that substantially affect likelihood of iQOS uptake in different countries. There was substantial variance in "switching" activity by market studied. Using PMI's number for "exclusive" switching the success varied from 7.77% in Italy to 21.48% in Japan. Self-reported "exclusive use" was considerably more common in South Korea (20.06%) and

Japan (21.48%) than it was in Germany (15.34%), Italy (12.95%) and Switzerland (7.7%). This suggests that different cultural, regulatory and commercial environments are substantial factors in user behavior, and the FDA should be cautious transposing this data (even with its significant limitations) into the unique cultural, regulatory and commercial environment of the United States.

Indeed, our own consumer research data looking at the marketing of iQOS in Japan and Switzerland showed significant differences in consumer perceptions, openness, and engagement with the product. Our research found that uptake in Switzerland has not been as strong as it was in Japan. While the product has been on the market longer in Japan, which may contribute to some of the conversion, there also appeared to be cultural differences between those two countries that contribute to the differences in use. For example, our research found that reasons iQOS users in Japan listed as to why they used iQOS were centered around respect for others and not offending anyone by imposing the smoke and smell of regular cigarettes on non-smokers. It was seen as something that could be done around non-smokers. Japanese users were willing to sacrifice the stronger taste intensity of regular cigarettes for the comfort of others. Whereas in Switzerland, smokers in the study were not as willing to sacrifice the intensity of smoking cigarettes and the feelings of freedom and release that smokers associate with cigarette smoking. Thus, the less satisfying use of iQOS was not strong enough to overcome the things that attract Swiss smokers to smoking cigarettes. One participant noted, “A friend and I decided to stay inside on a wet day and only smoke iQOS. By the end, we just really wanted a proper cigarette.”

Further, while some participants found that there were some benefits to the iQOS, including the gentler taste and the cleanliness – no ash and reduced odor – of the product, the potential health benefits of the product were not something that users seemed to prioritize. In Japan, while users did seem to grasp that it could potentially have benefit and potentially help them quit smoking, the main reasons they used the product were the cleanliness factors, that they could do it around non-smokers and in their homes or cars. However, in Switzerland (as well as those in Japan who did not take up iQOS), many smokers reported that not only was the intensity of the experience with iQOS not enough, they did not like the taste or smell at all. Additionally, the product was seen as cumbersome and complicated to use.[**]

Second, the data supplied by PMI in its application show dual use continues to be quite significant in all the markets. Dual use was reported in the studies we conducted as well. From the PMI data in Japan, the best-case market, over 78% of the test study continued to use cigarettes and over 50% still fell within PMI’s categories for dual-use and predominant cigarette use. In Switzerland over 90% of study participants still used cigarettes and over 80% fell within PMI’s categories for dual use and predominant cigarette use. Again, this suggests that there are substantial differences within test markets that cannot easily be

[**] A more in-depth discussion of our findings in Japan and Switzerland can be found in Appendix F

transposed to the United States environment. Also, as noted earlier in this comment, it suggests that the introduction of modified risk tobacco products into a market is far from a silver bullet solution to the tobacco epidemic. The FDA must consider the role of reduced harm products in the context of an overall strategy to reduce death and disease from tobacco, and these products without complementary restriction on the addictiveness and appeal of combustible products do not promise to lead to a substantial acceleration in ending the tobacco epidemic.

Lastly, it is unclear whether the data presented by PMI in its application are the only findings it has from its test marketing in various countries. To the extent such data exists, PMI should reveal it to the FDA including any work it has done showing what factors have led to better complete switching results. This should include items such as consumer research, focus group research, informal customer feedback, internal analyses, and how marketing plans and commercial environments affected individual country performance.

B. The Actual Use Study Conducted in the U.S. Does Not Show iQOS to be a Strong Substitute for Combustible Cigarettes

While PMI's study of actual use in the United States by necessity provides a far more limited data set than the Whole Offer test studies as noted in Study Report THS-PBA-07-US, the data presented in that study only emphasize the concerns presented by the Whole Offer data. Of the 1,106 subjects that met the criteria for the Full Analysis Set (FAS) of the study only one-third reported using more than 100 HeatSticks during the six-week study period as shown in Table 11. Because the study participants were current daily smokers by definition,[49] this indicates that two-thirds did not use iQOS or HeatSticks beyond the "early stages" of experimentation and continued smoking regular cigarettes. Of the 374 participants who met PMI's criteria for "using" iQOS, only 116 reported using HeatSticks for 70% or more of their tobacco product use by the end of the study period, and, of course, this group still included individuals with significant dual use. The data in Table 14 also show around 15% of those who at one point met the 70% use criteria fell below that mark during the study period. As the application notes this "switch back" number continued to increase as the study went on and did not stabilize, indicating there may have been more "switching back" as time progressed.[50] Thus, ultimately only around 10% of the total study population ended the study as 70% or over Heatstick users, even when the product was given away for free to paid study participants.[51] Moreover, Table 15 indicates that by the end of the six-week study only 58 study participants used HeatSticks "exclusively". When compared to the entire FAS (1,106 participants), this represents only 5.2% of study participants. Of this group, 44 of the 58 were individuals who reported "exclusive" HeatStick use from the beginning of the study, suggesting possible response issues in that participants may have mistakenly only reported HeatStick use instead of all product use, or may have understood the aim of the study was for study participants to exclusively use the provided product.

Furthermore, this study did not show other strong indications that smokers would be likely to switch completely to iQOS and not smoke combustible cigarettes. For example, among the full FAS, only 10% indicated that they liked the taste, smell or aftertaste, and 25% indicated they didn't like it at all. Even among those who used at least 100 HeatSticks by the end of week six, only 27.5% indicated they liked the taste "very much". Further, as noted above, there was low intent to purchase iQOS with their own money.[52]

V. PMI's Own Data Demonstrate New Product Alternatives Alone Will Be Insufficient to End Tobacco Epidemic. FDA Must Act Quickly to Reduce the Appeal, Toxicity and Addictiveness of Cigarettes.

To date, the discussion around "tobacco harm reduction" has almost been entirely around the risk profiles of new tobacco products (like iQOS). But without a focus on the cigarette and the other combustible products that cause the *vast* majority of death and disease, it is far from clear that new products by themselves will substantially alter the course of the tobacco epidemic. As discussed above, PMI's data about actual use in foreign markets and its actual use test in the United States indicate that iQOS is far from a silver bullet. PMI's submission on Effect on Population as a Whole[53] also implicitly recognize the limitations of new MRTPs without other interventions designed to curb cigarette use.

Taking the application analyses of population impact at face value, PMI's model predicts that if in 1990 every smoker had quit with no subsequent uptake of smoking, it would have resulted in 938,348 lives saved in the following 20-year period.[54] While the application considers several other scenarios, using its "Business Case" model, it concludes the introduction and subsequent adoption of iQOS by 29% of tobacco users by the end of the 20-year model period would save between 70,274-90,425 lives.[55] This isn't to endorse this analysis, but rather to point out even under the parameters set forth by the application, the impact would be under 10% of complete cessation. As the application notes, even these gains could be eliminated by "fairly significant changes in the rates of cessation from cigarettes (decrease), initiation or re-initiation (increased), and if there is a substantial increase in consumption among dual users."[56] PMI's Whole Offer and Actual Use data indicate that its business case may be overly optimistic and that there is substantial concern that smokers will completely switch from cigarettes to iQOS over the long term.

This reemphasizes a fundamental component of the harm reduction debate – the primary agent of harm is the cigarette. As Truth Initiative has repeatedly stated, we believe reduced harm products do have a role in the elimination of tobacco related death and disease. However, they are far from the only tool, and in the long run, models about the impact of reduced-harm products will only be as good as their assumptions. We are encouraged that the current leadership of the FDA grasps this principle. As Commissioner Gottlieb has noted, a truly comprehensive harm reduction policy must consider the *entirety* of nicotine delivery.

In a regulatory regime where the cigarette remains unchanged and the FDA has not used its power to reduce its addictiveness, appeal and toxicity, it is possible that products like iQOS will ultimately serve as category builders with at best modest impacts on public health. In a regulatory regime where everyone, and particularly youth and young adults, is protected from the cigarette, a product that is both highly addictive and toxic, the public health discussion around other nicotine delivery products can be on their own merits and harms including on their potential as replacement products for cigarette smokers that still desire nicotine. As the letter of tobacco control groups of October 13, 2017 sets forth, time is of the essence in adopting a comprehensive approach towards nicotine (Appendix G). We encourage the FDA to consider the urgency of this task as it considers this application in total.

VI. Conclusion

In conclusion, Truth Initiative continues to believe that *bona fide* modified risk products can benefit public health by providing less harmful alternatives to those who cannot or will not quit smoking cigarettes - the number one cause of preventable disease in our country. However, FDA must review the iQOS application carefully to determine if it meets the rigorous standards set out by Congress to accomplish that goal. Truth Initiative's view is that there are substantial deficiencies in PMI's application with regard to the planned marketing of the product, particularly those deficiencies which make it impossible to understand the potentially dangerous impact on youth. The FDA should require PMI to address these deficiencies before considering issuing an MRTP marketing order. PMI's data also raise substantial doubt as to whether smokers are likely to completely switch to iQOS after initial experimentation, particularly as long as addictive cigarettes remain widely available in the market. Indeed, in our view, PMI's data taken at face value demonstrate the relatively low potential for positive population impact through the introduction of an MRTP without further intervention. Considered as a whole, PMI's application supports the necessity for quick implementation of FDA's plan to reduce nicotine to non-addictive levels in cigarettes and other combusted tobacco products if it truly wants to dramatically accelerate the end of the tobacco epidemic.

Sincerely,

M. David Dobbins
Chief Operating Officer

References

1. Food, Drug and Cosmetic Act as amended by the Family Smoking Prevention and Tobacco Control Act. §911, (2009).
2. *U.S. v. Philip Morris USA, Inc., et al*., No. 99-CV-02496GK (U.S. Dist. Ct., D.C.) (Final Opinion) (August 17, 2006). Available at: http://www.justice.gov/civil/cases/tobacco2/amended%20opinion.pdf.
3. Family Smoking Prevention and Tobacco Control and Federal Retirement Reform, P.L. 111-31, §123 Stat. 1776, 2(42), 2009. https://www.gpo.gov/fdsys/pkg/PLAW-111publ31/html/PLAW-111publ31.htm.
4. Family Smoking Prevention and Tobacco Control and Federal Retirement Reform, P.L. 111-31, §123 Stat. 1776, 2(43), 2009. https://www.gpo.gov/fdsys/pkg/PLAW-111publ31/html/PLAW-111publ31.htm.
5. Family Smoking Prevention and Tobacco Control and Federal Retirement Reform, P.L. 111-31, §123 Stat. 1776, 2(36), 2009. https://www.gpo.gov/fdsys/pkg/PLAW-111publ31/html/PLAW-111publ31.htm.
6. Truth Initiative. Truth Initiative supports tobacco harm minimization effort. 2017; https://truthinitiative.org/news/truth-initiative-supports-tobacco-harm-minimization-effort.
7. St.Helen G, Jacob P, Nardone N, Benowitz N. Comment to Docket FDA-2017-D-3001-0129. Because PMI application did not report the full range of HPHCs in IQOS aerosol, characterize HPHCs in sidestream emissions, include a non-targeted analysis of chemicals in emissions, or conduct clinical studies to describe exposure to toxicants during dual use with other tobacco products, FDA must deny PMI's application. 2017; https://www.regulations.gov/document?D=FDA-2017-D-3001-0129.
8. Committees on Toxicity, Carcinogenicity and Mutagencitiy of Chemicals in Food, Consumer Products and the Environment. 2017. Statement on the toxicological evaluation of nove heat-not-burn tobacco products. https://cot.food.gov.uk/sites/default/files/heat_not_burn_tobacco_statement.pdf.
9. Committees on Toxicity, Carcinogenicity and Mutagencitiy of Chemicals in Food, Consumer Products and the Environment. 2017. Toxicological evaluation of novel heat-not-burn tobacco products - non-technical summary. https://cot.food.gov.uk/sites/default/files/heat_not_burn_tobacco_summary.pdf.
10. Lasseter T, Bansal P, WIlson T, Miyazaki A, Wilson D, Kalra A. Special Report: Scientists describe problems in Philip Morris e-cigarette experiments. December 20, 2017; https://www.reuters.com/article/us-tobacco-iqos-science-specialreport/special-report-scientists-describe-problems-in-philip-morris-e-cigarette-experiments-idUSKBN1EE1GG.
11. Philip Morris International Management S.A. Module 2.7: Executive Summary. Page 110.
12. Nebehay, S. Tobacco industry blocking anti-smoking moves: WHO. Reuters. 2017 Jul 19. https://www.reuters.com/article/us-health-tobacco-who/tobacco-industry-blocking-anti-smoking-moves-who-idUSKBN1A41ZB (accessed 7 December 2017).

13. Boseley, S. Threats, bullying, lawsuits: tobacco industry's dirty war for the African market. The Guardian. 2017 Jul 12. https://www.theguardian.com/world/2017/jul/12/big-tobacco-dirty-war-africa-market (accessed 7 December 2017).
14. Glenza, J. Big tobacco still sees big business in America's poor. The Guardian. 2017 Jul 13. https://www.theguardian.com/world/2017/jul/13/tobacco-industry-america-poor-west-virginia-north-carolina.
15. Swan, R. Group seeks referendum on flavored tobacco ban in S.F. San Francisco Chronicle. 2017 Jul 12. http://www.sfchronicle.com/politics/article/Group-seeks-referendum-on-flavored-tobacco-ban-in-11284771.php.
16. Craver, R. Referendum will target San Francisco ban on flavored tobacco products. Winston-Salem Journal. 2017 Sep 6. http://www.journalnow.com/business/business_news/local/referendum-will-target-san-francisco-ban-on-flavored-tobacco-products/article_c13687e3-1672-52f7-aa37-3d94401f2ec2.html.
17. City of San Francisco. Ordinance No. 0140-17. Health Code - Banning the Sale of Flavored Tobacco Products. 2017; http://sfbos.org/sites/default/files/o0140-17.pdf.
18. Calantzopoulos, A. Open Response to Letter of 14 September 2017 calling on PMI to stop selling cigarettes. 2017 Sep 29. https://www.pmi.com/media-center/news/details/Index/open-letter-from-PMI.
19. Philp Morris International. Philip Morris International 2016 Annual Report. New York, NY. http://eproxymaterials.com/interactive/pm2016/.
20. Altria Group, Inc. Altria Group, Inc. 2016 Annual Report. Richmond, VA. Page 2. http://www.altria.com/annualreport/2016/downloads/Altria-2016-Annual-Report-Final.pdf.
21. Philp Morris International. Philip Morris International 2016 Annual Report. New York, NY. Page 1. http://eproxymaterials.com/interactive/pm2016/.
22. Petroff, A. The 10 most valuable global brands. CNN Money. 2015 May 27. http://money.cnn.com/gallery/news/companies/2015/05/26/most-valuable-brands/10.html
23. U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;2012.
24. Glasser AM, Johnson AL, Rath JM, Williams VF, Vallone DM, Villanti AC. Tobacco Product Brand Preference among US Young Adults, 2011-2014. *Tobacco regulatory science.* 2016;2(1):44-55.
25. Philp Morris International. Qualitative Study to Develop THS 2.2 Potential Label, Labeling and Marketing Material – THS-PBA-04-US. 2015 APR; Page 36.
26. Philp Morris International. Qualitative Study to Develop THS 2.2 Potential Label, Labeling and Marketing Material – THS-PBA-04-US. 2015 APR.
27. National Cancer Institute. *The Role of the Media in Promoting and Reducing Tobacco Use. Tobacco Control Monograph No. 19.* Bethesda, MD: U.S. Department

of Health and Human Services, National Institutes of Health, National Cancer Institute;2008.
28. Dube SR, Arrazola RA, Lee J, Engstrom M, Malarcher A. Pro-tobacco influences and susceptibility to smoking cigarettes among middle and high school students--United States, 2011. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine.* 2013;52(5 Suppl):S45-51.
29. Henriksen L, Feighery EC, Schleicher NC, Haladjian HH, Fortmann SP. Reaching youth at the point of sale: cigarette marketing is more prevalent in stores where adolescents shop frequently. *Tobacco control.* 2004;13(3):315-318.
30. U.S. Department of Health and Human Services. *The health consequences of smoking – 50 years of progress: a report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;2014.
31. Philp Morris International. Qualitative Study to Develop THS 2.2 Potential Label, Labeling and Marketing Material – THS-PBA-04-US. 2015 APR; Page 25.
32. Short, K. 11 Ads malboro Swears Don't Target Teenagers. Huffington Post. 2014 Mar 12. https://www.huffingtonpost.com/2014/03/12/marlboro-teens-ads_n_4949300.html.
33. Philip Morris International Management S.A. Module 4: Labels, Labeling and Advertising. Page 6.
34. Herzog B. Wells Fargo Securities Equity Research. Nielsen: Tobacco 'All Channel' Data - 12/2. December 12, 2017.
35. Philip Morris International Management S.A. Module 4: Labels, Labeling and Advertising. Page 9.
36. Philip Morris International Management S.A. Module 4: Labels, Labeling and Advertising. Page 4.
37. Truth Initiative. Tobacco Nation: The Deadly State of Smoking Disparity in the U.S. 2017; https://truthinitiative.org/tobacconation.
38. eMarketer. Ethnic Groups Don't See Themselves in Advertising, Digital Content. 2011; https://www.emarketer.com/Article/Ethnic-Groups-Dont-See-Themselves-Advertising-Digital-Content/1008746.
39. Sapna Maheshwari. Different Ads, Different Ethnicities, Same Car. *New York Times*October 12, 2017.
40. Whittler TE. Viewers' processing of actor's race and message claims in advertising stimuli. *Psychology & Marketing.* 1989;6(4):287-309.
41. Forehand MR, Deshpandé R. What we see makes us who we are: Priming ethnic self-awareness and advertising response. *Journal of Marketing Research.* 2001;38(3):336-348.
42. Jamal A, Peñaloza L, Laroche M. *The Routledge companion to ethnic marketing.* Routledge; 2015.
43. Philip Morris International Management S.A. Actual Use Study of THS 2.2 – THS-PBA-07-US. 2016 Aug 22; Page 117.

44. Jamal A, King BA, Neff LJ, Whitmill J, Babb SD, Graffunder CM. Current Cigarette Smoking Among Adults - United States, 2005-2015. *MMWR. Morbidity and mortality weekly report.* 2016;65(44):1205-1211.
45. Food and Drug Administration. Technical Project Lead {TPL) Review: SE0000276,SE0000277,SE0000278,SE0000281. Page 21. 2015; https://www.fda.gov/downloads/TobaccoProducts/Labeling/MarketingandAdvertising/UCM462402.pdf.
46. U.S. Food and Drug Administration. *Preliminary Scientific Evaluation of the Possible Public Health Effects of Menthol versus Nonmenthol Cigarettes.* Silver Spring, MD: Center for Tobacco Products, Food and Drug Administration;2013.
47. Philip Morris International Management S.A. Actual Use Study of THS 2.2 – THS-PBA-07-US. 2016 Aug 22.
48. Philip Morris International Management S.A. Module 7.3.3: Whole Offer Test (WOT) Study Report. Page 19.
49. Philip Morris International Management S.A. Actual Use Study of THS 2.2 – THS-PBA-07-US. 2016 Aug 22; Page 30.
50. Philip Morris International Management S.A. Actual Use Study of THS 2.2 – THS-PBA-07-US. 2016 Aug 22; Page 153.
51. Philip Morris International Management S.A. Actual Use Study of THS 2.2 – THS-PBA-07-US. 2016 Aug 22; Page 38.
52. Philip Morris International Management S.A. Actual Use Study of THS 2.2 – THS-PBA-07-US. 2016 Aug 22; Pages 105-108.
53. Philip Morris International Management S.A. Module 6.5: Effect on the population as a whole.
54. Philip Morris International Management S.A. Module 6.5: Effect on the population as a whole. Page 46.
55. Philip Morris International Management S.A. Module 6.5: Effect on the population as a whole. Page 45.
56. Philip Morris International Management S.A. Module 6.5: Effect on the population as a whole. Page 47.

Appendix A

truth initiative
INSPIRING TOBACCO-FREE LIVES

truth initiative supports tobacco harm minimization effort

Tobacco is the leading cause of preventable death in the U.S. 540,000 Americans die prematurely from tobacco use each and every year. Millions more suffer from tobacco-related diseases. Truth Initiative strives to build a generation of Americans for whom tobacco use is a thing of the past. Furthermore, because the vast majority of tobacco users begin as teens or young adults, our mission is to achieve a culture where all youth and young adults reject tobacco.

As we actively pursue our vision, we recognize two important additional factors. First, as established by the 2014 Surgeon General's Report, *The Health Consequences of Smoking – 50 Years of Progress*, combustible tobacco products – cigarettes, cigars, little cigars, cigarillos, hookah and roll your own tobacco – are responsible for the overwhelming majority of the toll of death and disease caused by tobacco. Second, some tobacco users may be unable or unwilling to quit using combustible products. Therefore, as we continue to work toward our ultimate goal, we endorse the important public health strategy of harm minimization. This strategy holds that the best way to eliminate tobacco-based harms is to eliminate tobacco use entirely and as early in life as possible. However, for those who have tried other methods and still are not able to quit, the death and disease that flow from tobacco use can be significantly reduced if those users switch to the *exclusive* use of regulated, least harmful, non-combustible nicotine delivery products. Given their particular vulnerability, there is no appropriate use of tobacco or nicotine-containing products by youth.

Prevention and early cessation are the most effective harm minimization strategies.

- **Prevention is the Right Policy for Youth.** The best way to avoid tobacco-related death and disease is to not use tobacco products in the first place. There is no appropriate role for youth tobacco or nicotine use, regardless of the product – except in the limited circumstance where established youth smokers are using low-risk products as a strategy to end all tobacco use.
- **Cessation Is the Best Course For Tobacco Users.** The most effective way for a current tobacco user to minimize tobacco-related harms is to stop all tobacco use and to do so as soon as possible. It is certainly difficult for many people to quit tobacco use – and simply not achievable for some – but for most people it is not impossible. Many smokers have been able to quit, either on their own or with the aid of evidence-based therapies approved by the United States Public Health Service (USPHS) Clinical Practice Guidelines. Any harm minimization strategy – and certainly any tobacco control policy – should include universal access to effective cessation interventions.

For those unable or unwilling to quit, harm will be minimized most effectively by eliminating use of combustible tobacco in favor of the exclusive use of the least harmful noncombustible products.

- While combustible products are by far the most dangerous tobacco products, there is also a continuum of risk among non-combustible tobacco and nicotine-containing products.

    - Current evidence demonstrates that the least harmful of these products are FDA-approved Nicotine Replacement Therapies (NRTs), which are regulated as drugs. Long-term use of nicotine in medicinal form has been found to be sufficiently safe and non-addictive to be available over the counter without prescription for all but high-risk individuals. These include pregnant women and those with health conditions for which nicotine is contra-indicated.
    - Among tobacco products, Swedish-style, low-nitrosamine snus are low on the risk continuum. In fact, the FDA concluded, based on a properly submitted new product application, that evidence shows that snus can benefit public health. As a result, FDA has allowed these products on the market.
    - Available evidence also indicates that properly regulated electronic nicotine delivery systems (ENDS) would be notably lower in risk than combustible tobacco, especially when used to facilitate cessation or a complete switch from combustible tobacco. We strongly encourage e-cigarette manufacturers to follow the precedent set by Swedish snus and submit new product applications for FDA review.
    - While less harmful than combustible tobacco, traditional chew tobacco still exposes users to higher levels of nitrosamines than some other currently available non-combustible products and thus presents the greatest risk within this class.
- Concurrent use, also called dual or poly use, of non-combustible and combustible tobacco can minimize harms only if such use is of limited duration and not on a long-term basis, leading to the timely cessation of all combustible product use. Current combustible tobacco users who switch as soon as possible to the exclusive use of a noncombustible product on the low end of the risk continuum will greatly reduce their exposure to tobacco-related harms.

FDA Regulation of All Tobacco Products is Essential for the Effective Implementation of a Harm Minimization Strategy.

Truth Initiative strongly supports the federal regulation of all tobacco and nicotine-containing products because *all* such products, even those relatively low on the harm continuum, present demonstrable health and safety risks to consumers. This is particularly so for youth. Proper regulation would lower risk by, among other important and common-sense public health goals, establishing a national minimum age for the sale of tobacco products; barring youth targeted tobacco advertising; ensuring that consumers have accurate and verifiable information about the ingredients in the products they are using; and providing manufacturing standards for the quality and basic safety of any mechanical devices including requiring child-resistant packaging for all tobacco products. Regulation would enable the FDA to issue product standards to: 1) reduce toxicity levels (as in the recently proposed rule reducing NNN levels in smokeless tobacco); 2) decrease the appeal of tobacco products, for example, by eliminating flavors which are so attractive to youth; and 3) minimize the addictiveness of these products. Of significant importance, regulation would protect consumers against unverified claims of reduced harm. In the absence of regulation, manufacturers can (and some have) made unsubstantiated claims of reduced harms, putting consumers at substantial risk by making it virtually impossible for them to know which products are safer and which will help them quit tobacco. Meaningful regulation would establish a pathway for manufacturers of harm-minimized products to make verified reduced harm claims.

In May 2016, FDA issued its "deeming regulation," which takes important steps toward achieving the regulatory steps listed above by bringing all tobacco products under its jurisdiction. Truth Initiative strongly supports this regulation. We note with great concern that

FDA has delayed the implementation dates of certain key provisions and the regulation itself is under attack in both the courts and Congress.

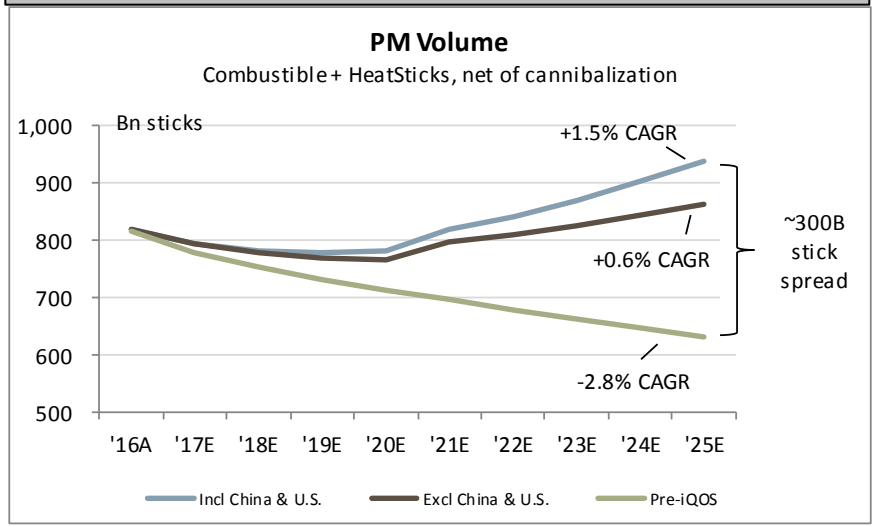
Despite its important role, the FDA is not the only agency with the ability to contribute to an effective harm minimization strategy. Examples of additional policies that will advance a harm minimization strategy include:

- *Tax Policies* should be designed to encourage adult consumers to use lower risk products by taxing more harmful products at a significantly higher rate than less dangerous products. However, because all tobacco products present risks, all tobacco products should be taxed.
- *Clean Air* regulations should be expanded to cover the use of all tobacco products that produce smoke or vapor. While there is not a definitive answer yet as to the extent of the harm caused by e-cigarette vapor, evidence supports that this vapor contains at least some nicotine and other chemicals and may be harmful. Non-users should not be exposed to these risks.

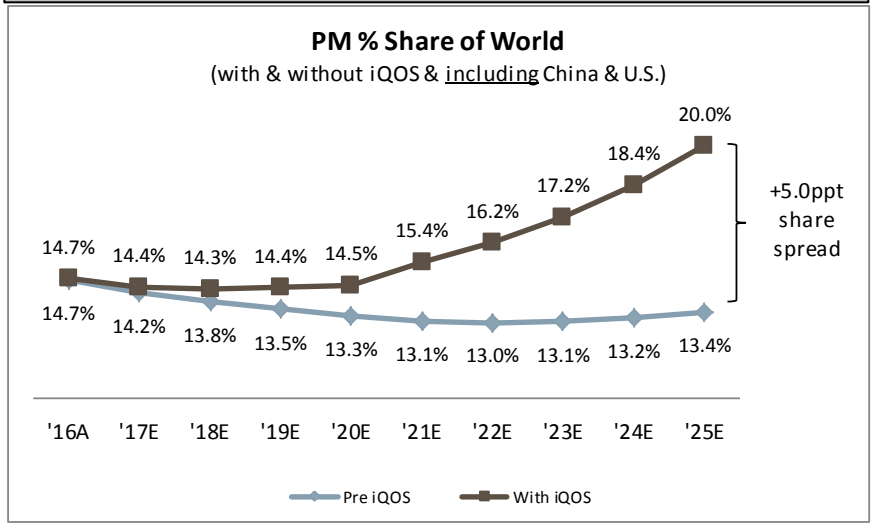
This statement is based on our best current understanding of the state of the science and the products on the market. Both the science and range of consumer products are rapidly evolving. There is also the possibility for regulatory changes at the state and local level. We will update this statement on a continuing basis to take into account relevant developments.

We See iQOS Taking Share & Increasing PM's Total Volume

iQOS significantly increases PM's volume trajectory including China & the U.S.



Each Share Pt is Roughly Equal to 50-60B Sticks, Thus PM's Volume Gain is Attributable to Share Gains



Making sense of the volume gain – it's about <u>incremental share gains</u>, not necessarily increasing overall consumption (although this is an opportunity in our view)

- PM's share of the global combustible market was ~14.7% in 2016
- Each share point is worth roughly 50-60B sticks
- We believe iQOS will drive <u>incremental share</u> gains for PM, increasing PM's overall global share by 5.0pts to 20.0% by 2025
- Math: 5.0 share pts x 55B sticks = ~290B sticks, in line with the spread we expect pre-iQOS vs post-iQOS

Note: (1) Left chart: PM CAGRs start at year 2016 vs slide 8 where 2017 is base year; (2) PM's % share of world in right chart declines as China is added to the base mix. **Source for both charts:** Wells Fargo Securities, LLC estimates.

WELLS FARGO SECURITIES

Philip Morris International Inc.

PM: iQOS Momentum To Drive Accelerated Topline Growth, But At A Cost

Trimming FY17/18 EPS Ests. As PM Invests Today For The Future

Outperform/$135.00

Tobacco
Overweight

Earnings Estimate Revised Down

- **Full Steam Ahead With iQOS Showing Critical Momentum – 7%+ Topline Growth the "New Normal" With Potential to Go to +HSD or +LDD –** PM's CFO Jacek Olczak presented at a conf. on 11/14, striking a very upbeat tone as the company sees enormous opportunity ahead for iQOS, including the potential for it to accelerate PM's overall topline growth to +HSD or +LDD (from 7%+ currently) over time. However, Olczak noted this accelerated topline growth will require some level of investment to ensure a sustainable level of growth at least for the next few years. Ultimately, we do believe this is the right l.t. strategy, especially as PM takes advantage of strong tax favorability across jurisdictions to acquire new consumers and establish a loyal customer base. However, since there is now realistically less flow through to the bottom line than we previously expected, we trim our FY17/18 EPS estimates by $0.04/$0.15 to $4.73/$5.30 (+9.3%/+11.2% growth) – still very attractive growth for a consumer staples company and especially for one that is in the process of transforming its business. From a valuation perspective, we believe n.t. pressures (including the new investment/growth algorithm and investors' frustration with visibility on PM's combustible cig business) is largely priced in. **Bottom line – We reiterate our Outperform rating and urge l.t. investors to take advantage of the weakness in PM's stock which we think is overdone. Our price target goes to $135 from $140.**
- **iQOS Is Setting the Industry's Pace for Global Development of Reduced-Risk Products (RRPs) –** We continue to remain bullish on the iQOS platform given its overwhelming success in Japan (gained 1.4 share pts to 13.3% national share since Q3), impressive momentum in Korea (gained 2.0 share pts to 4.5% national share), increasing mindshare in Europe, & strong investment advantage given the product's favorable tax profile. We anticipate iQOS has further potential to "break the mold" once again with Platforms 2-4 and look forward to its U.S. launch, which we think will be a 1Q18 event. Importantly, iQOS remains ahead of schedule in terms of profitability, breaking even on a dollar basis in Q2 and net contributing in Q3, although still dilutive in terms of margin given the investments being made behind iQOS devices & customer acquisition, which we expect to continue.
- **Other Key Takeaways** - **(1) Solid share gains** continuing across all 12 key launch markets; **(2) FDA TPSAC** - We think the FDA's scheduling of a TPSAC mtg on Jan 24-25 to review PM's modified risk (MRTP) application suggests the potential for premarket (PMTA) approval beforehand; **(3) Russia/GCC** - Expect pricing to improve in Russia in FY18, but pressure to continue through at least 1H18 in Saudi Arabia/GCC as the full annualized impact of the 100% tax increase is felt; **(4) Vol growth -** Expect total vol growth in Q4 led by iQOS HeatSticks; **(5) Philippines –** Expect overall vol weakness to continue, but Marlboro to continue gaining increm share as PM further premiumizes its portfolio by shedding low/no margin vol.

USD EPS	2016A	2017E Curr.	2017E Prior	2018E Curr.	2018E Prior
Q1 (Mar.)	$0.98	$0.98 A	NC	**$1.16**	**1.18**
Q2 (June)	1.15	1.14 A	NC	**1.29**	**1.31**
Q3 (Sep.)	1.25	1.27 A	NC	**1.40**	**1.43**
Q4 (Dec.)	1.10	**1.34**	**1.38**	**1.46**	**1.52**
FY	$4.48	**$4.73**	**4.77**	**$5.30**	**5.45**
CY	$4.48	$4.73		$5.30	
FY P/EPS	22.9x	21.7x		19.4x	
Rev.(MM)	$26,685	$28,792		$31,702	

Source: Company Data, Wells Fargo Securities, LLC estimates, and Reuters
NA = Not Available, NC = No Change, NE = No Estimate, NM = Not Meaningful
V = Volatile, = Company is on the Priority Stock List

Ticker	PM
Price Target/Prior:	**$135.00/$140.00**
Price (11/14/2017)	**$102.72**
52-Week Range:	$86-124
Shares Outstanding: (MM)	1,554.0
Market Cap.: (MM)	$159,627.0
S&P 500:	2,367.34
Avg. Daily Vol.:	4,268,380
Dividend/Yield:	$3.50/3.4%
LT Debt: (MM)	$26,595.0
LT Debt/Total Cap.:	139.4%
ROE:	NM
3-5 Yr. Est. Growth Rate:	12.0%
CY 2017 Est. P/EPS-to-Growth:	1.8x
Last Reporting Date:	10/19/2017

NC = No Change
Source: Company Data, Wells Fargo Securities, LLC estimates, and Reuters

Bonnie Herzog
Senior Analyst|212-214-5051
bonnie.herzog@wellsfargo.com

Patty Kanada, CFA
Associate Analyst|212-214-5029
patty.kanada@wellsfargo.com

Adam Scott
Associate Analyst|212-214-8064
adam.scott@wellsfargo.com

Please see page 11 for rating definitions, important disclosures and required analyst certifications. All estimates/forecasts are as of 11/15/17 unless otherwise stated. 11/15/17 00:16:59 ET

Key Takeaways

PM Reaffirmed its FY17 Currency-Neutral Net Revenue Growth Estimate of "Over 7%" – We Are At +9.0% and +9.6% for FY18

- 7%+ For Now, Possibly Going to +HSD or +LDD Longer Term: Given iQOS' continued strong performance and the market share momentum PM is seeing across its combustible cig and heated tobacco businesses, PM sees potential to accelerate its overall topline growth to +HSD or +LDD on a currency-neutral basis. While not all of that would be allowed to drop to the bottom line due to the investments required to sustain the higher rate, we believe it suggests a step-up in its all-around growth algorithm. PM will introduce FY18 guidance on Feb 8 (4Q17 results).

U.S. Market "Call Option" Looking Increasingly Attractive – FDA Schedules TPSAC Meetings – PMTA Approval Could Be Issued Beforehand

- FDA to Convene TPSAC Meetings on Jan 24-25: While we have previously suggested that the FDA might use information gathered at the Tobacco Products Scientific Advisory Committee (TPSAC) meetings (which will focus on PM's MRTP "modified risk" application) to inform its deliberation on PM's premarket application (PMTA), we note that there is nothing that precludes the FDA from granting iQOS PMTA approval ahead of the TPSAC meetings. This is important as it suggests PM/MO could be given the 'green light' to go to market with iQOS as early as January 2018 as we originally suggested following MO's Investor Day on Nov 2. Ultimately, we view the FDA's timely review as a strong positive signal and continue to expect the U.S. opportunity to be 100% incremental to PM based on its current royalty agreement with MO. In this sense, we see the U.S. as a call option on PM's stock particularly as we expect the combination of MRTP approval (we expect as early as May 2018) & an FDA mandate on combustible cig nicotine levels to accelerate smoker conversion to iQOS in addition to other RRPs. To recap, MRTP approval would allow iQOS to be marketed in the U.S. with a health claim (the FDA has never before granted one); PMTA approval would allow iQOS to be marketed without a health claim (which by the way is how iQOS is currently being marketed in Japan to great success).
- Incentives to Combine with MO Have Increased, In Our Opinion: While we acknowledge PM CEO Andre Calantzopoulos' statement earlier in the year that PM is not in fact interested in recombining with MO, we can't help but point out the increased attractiveness, in our view, of PM owning the U.S. market outright given the FDA's interest in accelerating the development of RRPs in the U.S., still relatively low interest rates, and the prospect of U.S. corporate tax reform in 2018.

iQOS Continues To Impress As It Pioneers New Growth Path

- Volume Gains: iQOS's success continues, posting solid, continued improvement in weekly offtake volume performance across most of its key markets.
- Market Share Gains Continue Despite Continued Strains on Device Supplies: iQOS market share in Japan continues to rise (to 13.3% national share in Oct from 11.9% in 3Q17), reflecting continued strong consumer uptake and despite some continued strain on device supplies as consumers in Japan seek to own multiple devices (which works out to roughly 1.5 devices per person on average)
- Consumer Conversion Remains Strong: iQOS continues to experience strong conversion rates of around 70% across all markets on average. PM estimates 4M smokers have fully converted to iQOS (up from 3.7M at the end of Q3).
- Benefits of Critical Mass Observed In Japan: PM's Japan learnings confirm that reaching 2-3% penetration (i.e., market share) is the "tipping point" on smoker conversion, after which consumer word-of-mouth education/marketing starts to accelerate, "dramatically increasing" volume gains and share contributions. In general, PM expects it to take 2-3 years to achieve this kind of "critical mass" in any given market.

Combustible Cig Market Updates

- Russia: While pressure from strong excise-tax-driven price elasticities, a pickup in illicit trade & constrained pricing should continue through Q4, the pricing environment should demonstrably improve in 2018 as excise taxes are set to increase by only 5RUB in July (vs 14RUB in 2017). To add context, without these pressures, PM would have been on track to deliver FY17 currency-neutral EPS growth of ~12% - at the high end of its previous guidance range (PM since lowered the range to 9-10%).

- Saudi Arabia: Expect profitability to remain pressured through 2018 given PM's leading share position (Philip Morris brand at 41%, Marlboro at 28%) and the sheer profitability of the market (e.g., Marlboro's margin in the country is higher than the Marlboro avg). Recall that a huge excise tax increase in June that effectively doubled retail prices sent industry volumes down more than 30% in Q3 with PM's brands heavily impacted. The impact on PM's overall financials was significant as PM has stated that without the Saudi Arabia & Russia pressures, PM only 5RUB in July (vs 14RUB in 2017). To add context, without these pressures, PM would have been on track to deliver FY17 currency-neutral EPS growth "well above" 12%. Notably, other Gulf Cooperation Council (GCC) markets are expected to take similar action on their excise tax structures as Saudi Arabia (UAE implemented changes in Oct), which will further pressure PM's financials through 1H18. However, we believe the impact will be somewhat less severe as Saudi Arabia is responsible for ~65% of the group's combined profitability, according to PM. Therefore, most of the pressure, we believe is now priced in. Overall, PM doesn't see pressure here easing until 2H18 at the earliest.
- Philippines: Volume still experiencing pressure, but price gaps narrowing, tax compliance is improving, and Marlboro continues to gain significant share (+3.5ppts to 31.9% market share) as consumers see opportunities to trade up.

Currency Headwinds Rise

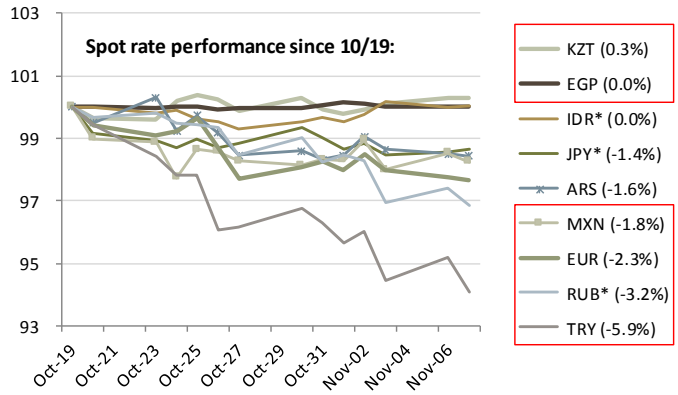
Currency Headwinds Pick Up Slightly in FY17, But PM Maintains EPS Guidance – Since PM reported Q3 results on 10/19, there's been some movement in PM's key currencies to the downside – a development we think has contributed to recent pressure on the stock. Adverse moves in the Turkish lira (-5.9%), Russian ruble (-3.2%), Euro (-2.3%) and Mexican peso (-1.8%) suggest a slightly stronger headwind to PM's FY17 adj EPS performance, but given the volatility of the currency market, we think it makes sense that PM chose to stay the course. Therefore, we maintain our expectation that f/x will be a **-$0.17/share headwind** to FY17 results (implying FY17 EPS of $4.71-$4.76 or +9%-10% growth Y/Y on a currency-neutral basis). Our f/x model suggests as much as a $0.02/share headwind to FY18 (vs our current +$0.05/share tailwind), but again given inherent volatilities in the currency market, we are okay with keeping our adj EPS estimate at $4.73 (+11.6% YOY growth).

Exhibit 1

Key FX spot rates for FY17 have weakened slightly since PM's 3Q17 Call

	PM FY17 Guidance Issued:			Spot Performance Since:		
	1Q17	2Q17	3Q17	1Q17	2Q17	3Q17
Currency Impacts	04/20/17	07/20/17	10/19/17	04/20/17	07/20/17	10/19/17
Egyptian Pound	($0.03)	($0.05)	($0.08)	2.5%	1.2%	0.0%
Euro	($0.07)	($0.05)	($0.05)	9.2%	1.1%	-2.3%
Japanese Yen	$0.01	($0.04)	($0.04)	-3.1%	-0.8%	-1.4%
Russian Ruble	$0.10	$0.06	$0.06	-2.3%	2.3%	-3.2%
Turkish Lira	($0.07)	($0.05)	($0.05)	2.3%	-1.4%	-5.9%
Key Currencies	**($0.06)**	**($0.13)**	**($0.16)**	**1.7%**	**0.5%**	**-2.6%**
Total "Other"	($0.02)	($0.01)	($0.01)	4.2%	-0.3%	-1.7%
Total FX Impact	**($0.08)**	**($0.14)**	**($0.17)**	**2.1%**	**0.3%**	**-2.4%**

Key currency moves since last PM guidance on 10/19/17 (Indexed to 10/19)



Note: Currencies priced as of 11/14/17. Source: FactSet, Wells Fargo Securities, LLC estimates

iQOS Cont. On Extraordinary Growth Trajectory–Well Ahead of Peers

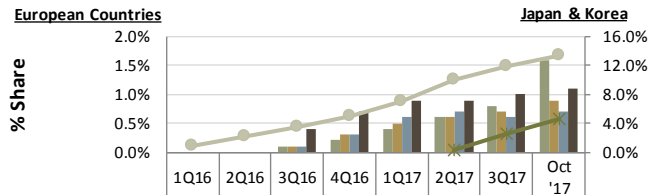
Update on International Launch Markets – We were pleased to hear that iQOS' strong success continues with solid market share gains across key markets, including Japan where iQOS' national share in is now at 13.3% share vs 11.9% in 3Q17. The brand's high consumer touch rate & strong word-of-mouth marketing in Japan has led to a growing set of loyal customers – many of whom seek to own multiple iQOS devices and pursue faster upgrades. PM currently estimates iQOS device ownership at roughly 1.5 devices per consumer (based on a total of ~4M iQOS consumers). While a welcome challenge, the increased demand continues to put pressure on device supply which, while starting to ease with the second manufacturer now online, will not likely get fully resolved until early 2018 given PM's current forecast for demand. Other key updates: PM remains on track to **(1)** roll out iQOS to a total of up to 35 markets by year end (31 currently); **(2)** raise HeatStick inventory in Japan to levels that will be commensurate with strong demand by year end; **(3)** continue to build iQOS awareness and product comprehension among adult smokers in European countries where laws governing consumer communication are much stricter than they are in Asia. We think this is the primary reason iQOS' share gains in Europe are much less "robust" than in Asia. That said, we are not very concerned as iQOS is not yet fully available in those markets (weighted distribution ranges from only 35-75% in launch markets) and most if not all launch markets continue to see sequential share growth on a national level (implies strong share gains in focused areas).

Update on FDA Review Process in the U.S. – As previously discussed, we think the FDA's scheduling of a TPSAC meeting to review PM's MRTP application (scheduled for Jan 24-25) is a very good sign that the process is moving along at an appropriate pace. It also suggests, PMTA approval could be announced before that time as there is nothing that precludes the FDA from granting iQOS PMTA approval ahead of the TPSAC meetings. In fact, we agree that it may even be advantageous for the FDA to grant the PMTA ahead of the TPSAC meeting to avoid diluting the meeting with questions/discussions related to the PMTA since the meeting is supposed to focus solely on the MRTP application. Therefore, we think PM/MO will be given the 'green light' to go to market with iQOS before January 24-25, 2018. For PM, we continue to view the U.S. opportunity as a solid win given it will be 100% incremental (i.e, PM faces no cannibalization risk) and it has the implicit backing of the FDA to the extent that the FDA's nicotine strategy requires strong and safer alternatives to cigs to be available on the market. In this sense, the U.S. remains a call option on PM's stock. MRTP approval to market iQOS with a health claim (which we continue to expect is now even more likely under the FDA's nicotine plan) should further accelerate smoker conversion to iQOS in addition to other RRPs.

Bottom line – We continue to be encouraged by the progress iQOS is making on both the international and domestic fronts. Our base case scenario suggests iQOS is worth an incremental $35/shr to PM, net of cannibalization, 640bps of additional topline growth and ~850bps to PM's bottom line.

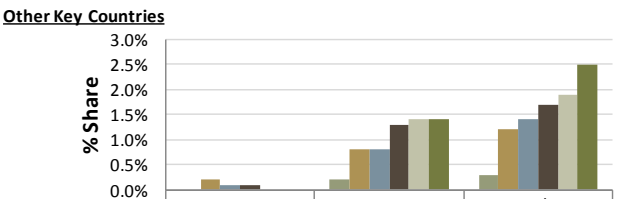
Exhibit 2

HeatStick Market Share Progression – Table 1
iQOS Gaining Across All Key Geographies



	1Q16	2Q16	3Q16	4Q16	1Q17	2Q17	3Q17	Oct '17
Portugal*			0.1%	0.2%	0.4%	0.6%	0.8%	1.6%
Italy			0.1%	0.3%	0.5%	0.6%	0.7%	0.9%
Germany**			0.1%	0.3%	0.6%	0.7%	0.6%	0.7%
Switzerland			0.4%	0.7%	0.9%	0.9%	1.0%	1.1%
Japan (RHS)	0.8%	2.2%	3.5%	4.9%	7.1%	10.0%	11.9%	13.3%
South Korea						0.2%	2.5%	4.5%

HeatStick Market Share Progression – Table 2
iQOS Gaining Across All Key Geographies

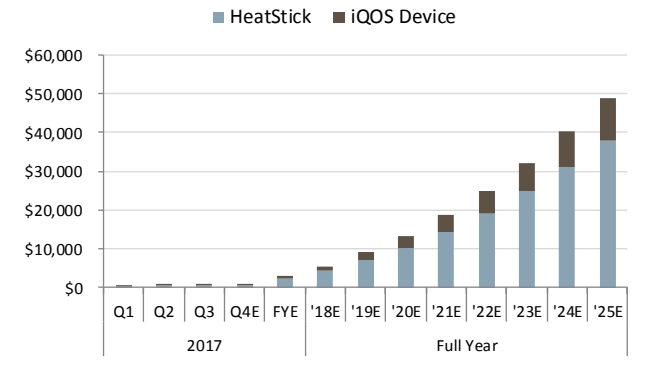


	3Q16	3Q17	Oct '17
Spain	0.0%	0.2%	0.3%
Russia	0.2%	0.8%	1.2%
Romania	0.1%	0.8%	1.4%
Ukraine	0.1%	1.3%	1.7%
Colombia	0.0%	1.4%	1.9%
Greece	0.0%	1.4%	2.5%

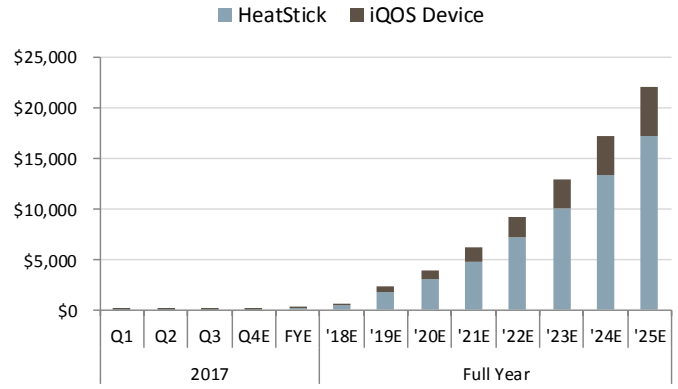
Source: Company reports, Wells Fargo Securities, LLC

Exhibit 2 (cont.)

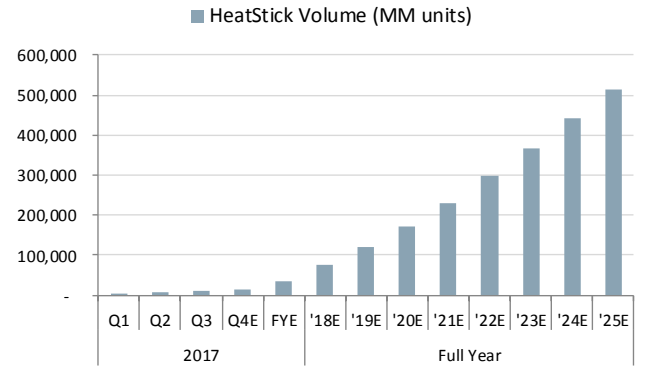
iQOS Net Revenue, 2017-2025E
($ in MM)



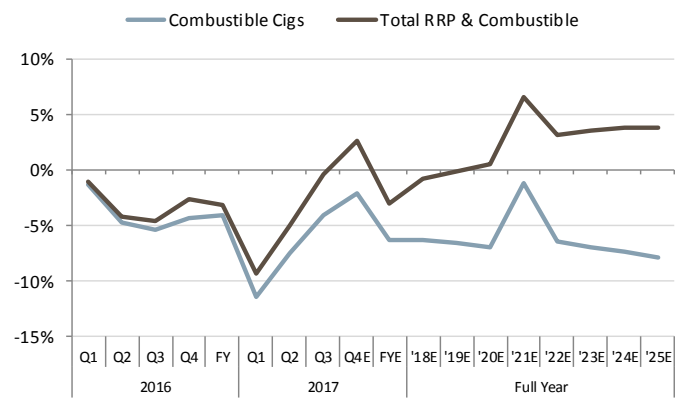
iQOS OCI Contribution, 2017-2025E
($ in MM)



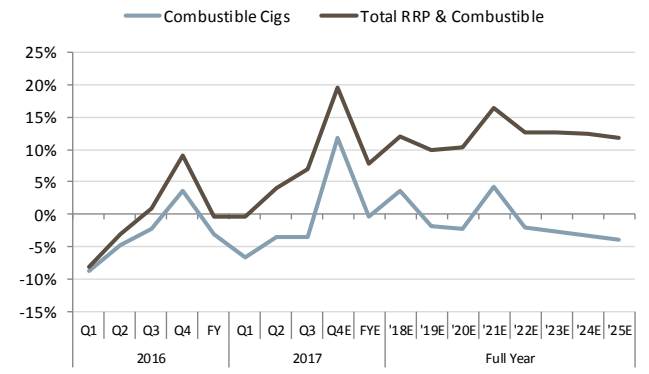
iQOS Volume, 2017-2025E
(%YOY)



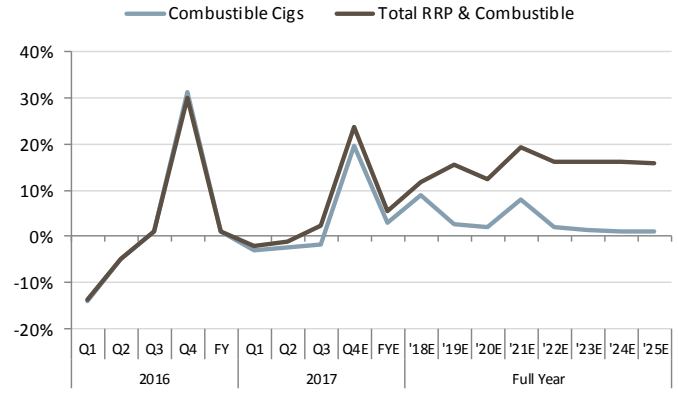
iQOS Volume Growth, 2017-2025E
(%YOY)



iQOS Revenue Growth, 2017-2025E
(%YOY)



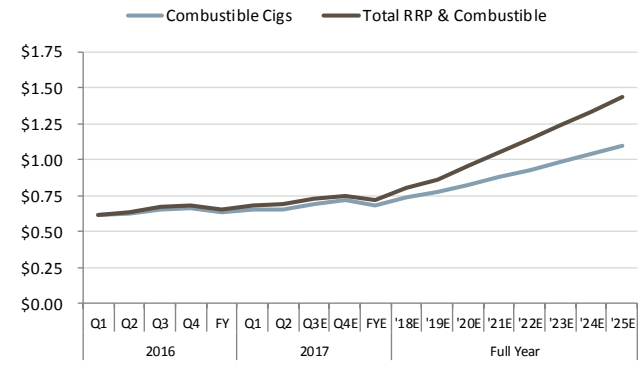
PM OCI Growth (%YOY)
Combustible Cigs vs Total RRP/Combustible



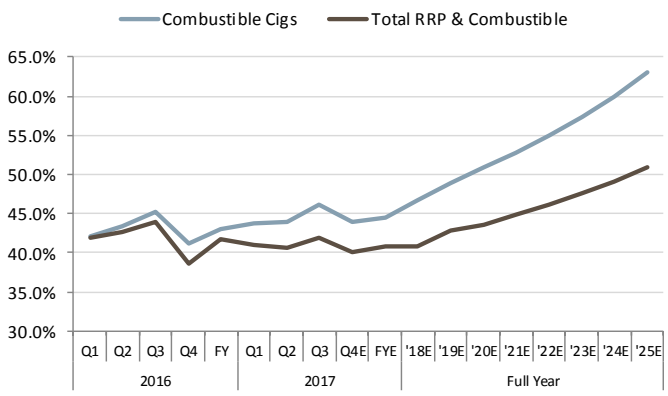
Source: PM 3Q17 Earnings Presentation, Company reports, Wells Fargo Securities, LLC estimates

Exhibit 2 (cont.)

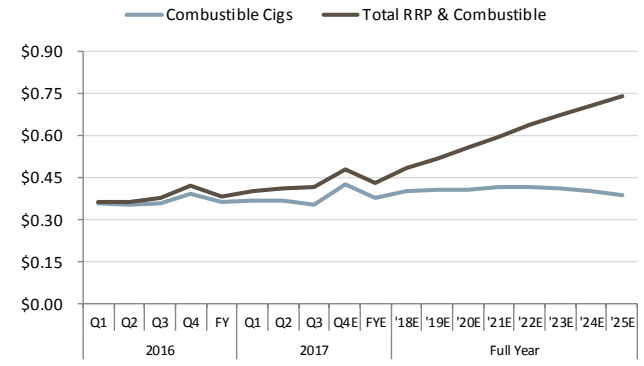
PM Net Revenue Per Pack
Combustible Cigs vs Total RRP/Combustible



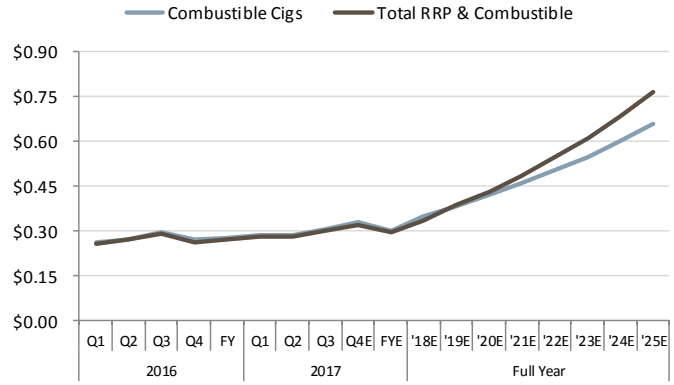
PM OCI Margin
Combustible Cigs vs Total RRP/Combustible



PM Total Costs Per Pack
Combustible Cigs vs Total RRP/Combustible



PM OCI Per Pack
Combustible Cigs vs Total RRP/Combustible



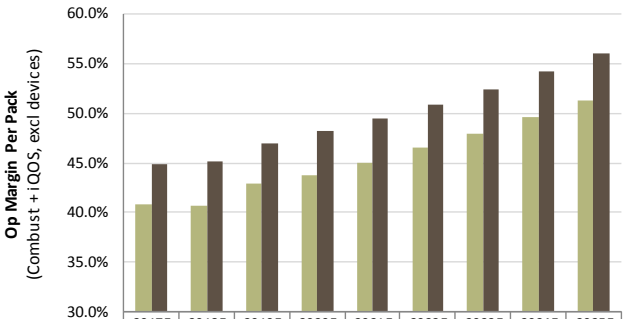
Source: Wells Fargo Securities, LLC estimates

U.S. Market "Call Option" Still Looks Attractive

Reunification of PM/MO Remains Attractive Opportunity – Despite statements by PM CEO Andre Calantzopoulos downplaying any active interest, we continue to believe a reunification of PM and MO makes sense given: **(1)** an, at the moment, still relatively low U.S. interest rate environment; **(2)** potential U.S. corporate tax reform; **(3)** a far less onerous legal environment in the U.S. (recall, legal overhang was a key factor driving PM's original spin-off from MO); **(4)** greater visibility on timing of commercializing iQOS in the U.S.; and **(5)** the likelihood of accelerated smoker conversion to iQOS and RRPs broadly under an FDA nicotine plan. **Bottom line –** We still believe PM would benefit from owning the U.S. market outright, rather than receive just a revenue & royalty stream from the sale of iQOS to MO and be in a position to "teach" MO the ins and outs of iQOS and marketing best-practices for RRPs. While we believe MO has more incentive now than ever to orchestrate a successful roll out of iQOS given the FDA's new plan (or risk losing first-mover advantage), we still believe PM could earn an even higher margin if it "owned" the U.S. market outright, which remains one of the key reasons why we think PM could acquire or combine with MO**.**

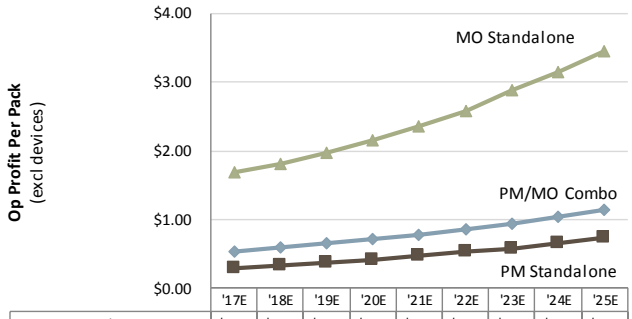
Exhibit 3

Margin Opportunity
We believe PM owning the US market outright could drive significant margin accretion



	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
PM Standalone	40.8%	40.7%	42.9%	43.8%	45.1%	46.5%	48.0%	49.6%	51.3%
PM/MO Combo	44.9%	45.1%	47.0%	48.2%	49.5%	50.9%	52.4%	54.2%	56.1%

The Attraction of the U.S. Market
The U.S. has long been regarded as the most lucrative cig market in the world



	'17E	'18E	'19E	'20E	'21E	'22E	'23E	'24E	'25E
MO Combust + iQOS	$1.69	$1.81	$1.98	$2.15	$2.37	$2.58	$2.89	$3.16	$3.46
PM/MO Combust + iQOS	$0.55	$0.59	$0.66	$0.72	$0.78	$0.85	$0.94	$1.04	$1.14
PM Combust + iQOS	$0.29	$0.33	$0.38	$0.42	$0.47	$0.53	$0.59	$0.65	$0.73

Source: Wells Fargo Securities, LLC estimates

Valuation

PM's stock price has increased +13.1% year-to-date (vs the S&P 500/Staples at +15.5%/+15.7%), but more recently has declined -8.7% (since 10.19) vs the S&P at +0.7%, creating an attractive entry point for investors, in our view. We believe PM's broader outperformance since the beginning of the year reflects in part the market starting to attribute some value to iQOS and its significant growth potential. Based on our sum-of-the parts DCF analysis, we believe **PM is worth $135/share** including incremental value for iQOS of $35/share, which could prove to be conservative. **We expect visibility to increase** as more data becomes available on iQOS and we receive more details on the continued rollout of Platform 1 and commercialization plans for Platforms 2-4 (not yet fully captured in our model).

Forward EV-to-EBITDA (absolute and relative) – Our new $135 price target implies a forward EV-to-EBITDA multiple of 17.7x, which is a 27% premium to PM's current EV-to-EBITDA multiple of 13.9x and a 24% premium to its 1-year average forward multiple of 14.3x. We believe PM deserves to trade above its historical average range given the opportunities it has for long-term top-line growth and margin expansion.

Forward P/E (absolute and relative) – Our new $135 price target implies a forward P/E multiple of 25.5x, which is a 32% premium to the company's current multiple of 19.4x and a 25% premium to the company's average 1-year forward P/E multiple of 20.5x. We believe that PM's growth prospects and fundamentals that exceed its peer group justify multiple expansion.

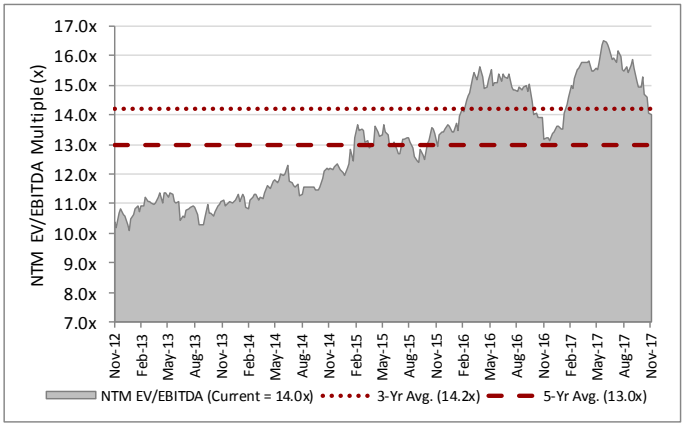
PM's Valuation Is Compelling On Long Term Growth Opportunities – In light of PM's long-term growth prospects and superior fundamentals compared to global consumer companies listed below, we believe PM should trade at higher relative multiples than many of its global consumer peers that don't have as robust of a growth and profitability profile on a currency-neutral basis. We estimate over the next 10 years, for example, iQOS could add ~600bps to PM's topline growth algorithm and ~850bps to its bottom line. PM currently trades roughly in line with staples peers and a +6.7% premium to the S&P500 on a CY+2 P/E basis, which we believe is appropriate given the opportunity with iQOS and PM's relative outperformance on key metrics, such as dividend yield, free cash flow yield, operating margins and ROIC. **Our new $135 price target (35.7% upside including dividend), implies forward target multiples of 17.7x (EV/EBITDA) and 25.5x (P/E).**

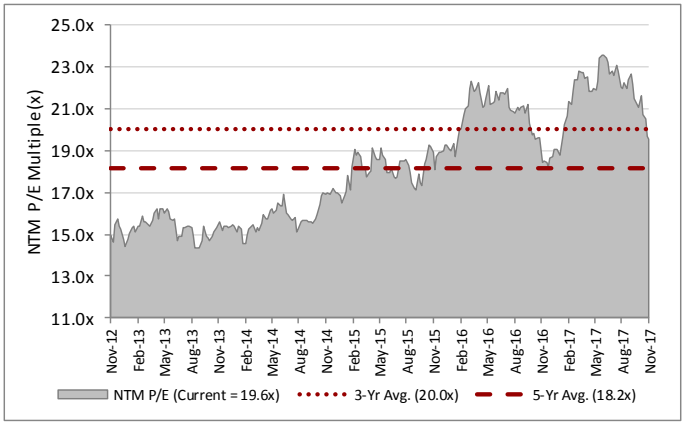
Exhibit 4

CY18 P/E Valuation Multiples	Price 11/14/17	Current			Post-Election (avg)			2016 (avg)			3-Year Average		
		Mult.	vs.Avg Staples	vs. S&P500	Mult.	vs.Avg Staples	vs. S&P500	Mult.	vs.Avg Staples	vs. S&P500	Mult.	vs.Avg Staples	vs. S&P500
PM	$102.72	**19.3x**	100.4%	106.7%	**19.0x**	98.3%	113.1%	**19.8x**	101.8%	124.3%	**19.3x**	100.4%	119.2%
MO	$65.73	**18.3x**	95.5%	101.5%	**20.0x**	103.6%	119.1%	**19.3x**	99.2%	121.1%	**18.9x**	98.4%	116.8%
BATS-GB	£49.00	**15.9x**	82.6%	87.8%	**16.2x**	84.1%	96.7%	**16.9x**	86.6%	105.7%	**16.6x**	86.4%	102.6%
IMB-GB	£30.92	**11.1x**	57.9%	61.6%	**12.9x**	66.8%	76.8%	**15.1x**	77.8%	95.0%	**14.4x**	75.2%	89.3%
2914-JP	¥3,751	**15.5x**	80.9%	86.0%	**16.1x**	83.6%	96.2%	**17.2x**	88.4%	107.9%	**16.2x**	84.6%	100.5%
Avg. Tobacco		16.0x	83.5%	88.7%	16.9x	87.3%	100.4%	17.7x	90.7%	110.8%	17.1x	89.0%	105.7%
XLP		**19.2x**		106.3%	**19.3x**		115.0%	**19.5x**		122.1%	**19.2x**		118.7%
SPX		**18.1x**			**16.8x**			**15.9x**			**16.2x**		

Source: FactSet, Wells Fargo Securities, LLC

Historical Valuation Trends





Source: FactSet, Wells Fargo Securities, LLC

Investment Thesis

We reiterate our Outperform rating on PM as we continue to be bullish on the company's ability to create value over the long-term based on: **(1)** superior and reinvigorated Marlboro brand franchise; **(2)** industry leading, diverse brand portfolio; **(3)** impressive ROIC and improving economic profit; **(4)** global leadership and long term upside opportunity in reduced-risk products (RRPs); and **(5)** track record of strong execution despite challenging macro conditions. PM's impressive results over the long term give us further conviction that the company has emerged in a class of its own and is poised for continued growth and margin expansion given that it is a much more nimble, less risk averse, more innovative, and more performance-driven company. Furthermore, we are very excited about PM's work on RRPs, accelerated commercialization time line and strategic partnership with Altria Group (MO, 1, $65.73). Importantly, we believe RRPs will be a game changer for the global tobacco industry and be margin enhancing given expected better tax treatment and the razor/blade model. We have long believed technology will play a pivotal role in shaping the future of the tobacco industry and it appears that dramatic change is happening with PM as a first mover with the rollout of its iQOS platform. Given PM's superior profit, existing infrastructure, capital strength, strong free cash flow, attractive dividend yield of 3-4%, leading global brand portfolio including Marlboro, and deep management team with superior knowledge of the global tobacco industry, we expect the stock to outperform over the next 12 months.

Philip Morris International (PM) - Quarterly Earnings Model

Wells Fargo Securities, LLC
Bonnie Herzog (212) 214-5051
bonnie.herzog@wellsfargo.com

($MM, except per-share data)
Source for all tables: Company reports and Wells Fargo Securities, LLC estimates

	2013	2014	2015	2016	1Q17	2Q17	3Q17	4Q17E	2017E	1Q18E	2Q18E	3Q18E	4Q18E	2018E
Gross Revenue	80,029	80,106	73,908	74,953	16,556	19,319	20,638	21,088	77,601	17,331	20,157	21,120	21,053	79,661
Excise Taxes	48,812	50,339	47,114	48,268	10,492	12,402	13,165	12,750	48,809	10,722	12,251	12,753	12,232	47,959
Net Revenue (net of excise taxes)	**31,217**	**29,767**	**26,794**	**26,685**	**6,064**	**6,917**	**7,473**	**8,338**	**28,792**	**6,609**	**7,905**	**8,366**	**8,821**	**31,702**
Cost of Sales	10,410	10,436	9,365	9,391	2,177	2,519	2,735	3,043	10,474	2,333	2,854	2,928	3,114	11,229
% of Net Revenue	*33.3%*	*35.1%*	*35.0%*	*35.2%*	*35.9%*	*36.4%*	*36.6%*	*36.5%*	*36.4%*	*35.3%*	*36.1%*	*35.0%*	*35.3%*	*35.4%*
Gross Profit	**20,807**	**19,331**	**17,429**	**17,294**	**3,887**	**4,398**	**4,738**	**5,295**	**18,318**	**4,276**	**5,052**	**5,438**	**5,707**	**20,473**
Gross Margin	*66.7%*	*64.9%*	*65.0%*	*64.8%*	*64.1%*	*63.6%*	*63.4%*	*63.5%*	*63.6%*	*64.7%*	*63.9%*	*65.0%*	*64.7%*	*64.6%*
Marketing, Admin & Research Costs	6,703	6,836	6,494	6,244	1,418	1,615	1,614	2,056	6,703	1,466	1,977	2,097	2,222	7,763
% of Net Revenue	*21.5%*	*23.0%*	*24.2%*	*23.4%*	*23.4%*	*23.3%*	*21.6%*	*24.7%*	*23.3%*	*22.2%*	*25.0%*	*25.1%*	*25.2%*	*24.5%*
Equity (Income)/Loss in Unconsol Subsidiaries	22	(105)	(105)	(94)	(22)	(23)	(12)	(20)	(77)	(20)	(25)	(35)	(30)	(110)
Operating Companies Income (OCI)	**14,082**	**12,600**	**11,040**	**11,144**	**2,491**	**2,806**	**3,136**	**3,259**	**11,692**	**2,830**	**3,100**	**3,376**	**3,515**	**12,820**
OCI Margin	*45.1%*	*42.3%*	*41.2%*	*41.8%*	*41.1%*	*40.6%*	*42.0%*	*39.1%*	*40.6%*	*42.8%*	*39.2%*	*40.4%*	*39.8%*	*40.4%*
Amortization	93	93	82	74	22	22	21	19	84	19	19	19	19	74
General Corporate Expense	187	165	162	161	51	40	35	42	168	36	43	46	49	174
% of Net Revenue	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.8%*	*0.6%*	*0.5%*	*0.5%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*	*0.6%*
Operating Income (EBIT)	**13,824**	**12,237**	**10,691**	**10,815**	**2,396**	**2,721**	**3,068**	**3,179**	**11,364**	**2,755**	**3,013**	**3,277**	**3,418**	**12,462**
EBIT Margin	*44.3%*	*41.1%*	*39.9%*	*40.5%*	*39.5%*	*39.3%*	*41.1%*	*38.1%*	*39.5%*	*41.7%*	*38.1%*	*39.2%*	*38.7%*	*39.3%*
Interest Expense	973	1,052	1,008	891	219	213	223	240	895	239	237	237	239	950
Pretax Earnings	**12,851**	**11,185**	**9,683**	**9,924**	**2,177**	**2,508**	**2,845**	**2,938**	**10,468**	**2,516**	**2,776**	**3,040**	**3,179**	**11,511**
Income Taxes	3,755	3,224	2,756	2,768	603	689	812	823	2,927	687	749	848	890	3,175
Effective Tax Rate	*29.2%*	*28.8%*	*28.5%*	*27.9%*	*27.7%*	*27.5%*	*28.5%*	*28.0%*	*28.0%*	*27.3%*	*27.0%*	*27.9%*	*28.0%*	*27.6%*
Net Earnings Attrib to Noncontrolling Interests	274	165	159	283	68	61	75	45	249	50	50	50	50	200
Earnings Attrib to Share-Based Pmt Awards	44	35	24	20	3	5	4	5	17	5	5	5	5	20
Adjusted Net Earnings	**8,756**	**7,866**	**6,849**	**6,947**	**1,525**	**1,776**	**1,966**	**2,086**	**7,353**	**1,794**	**1,996**	**2,172**	**2,264**	**8,227**
Diluted Shares Outstanding	1,622	1,566	1,549	1,551	1,553	1,554	1,554	1,554	1,554	1,553	1,553	1,552	1,552	1,552
GAAP EPS	**$5.26**	**$4.76**	**$4.42**	**$4.48**	**$1.02**	**$1.14**	**$1.27**	**$1.34**	**$4.77**	**$1.16**	**$1.29**	**$1.40**	**$1.46**	**$5.30**
Adj. Diluted EPS	**$5.40**	**$5.02**	**$4.42**	**$4.48**	**$0.98**	**$1.14**	**$1.27**	**$1.34**	**$4.73**	**$1.16**	**$1.29**	**$1.40**	**$1.46**	**$5.30**
EBITDA	14,706	13,126	11,445	11,558	2,593	2,931	3,293	3,407	12,224	2,943	3,234	3,510	3,659	13,345
EBITDA Margin	*47.1%*	*44.1%*	*42.7%*	*43.3%*	*42.8%*	*42.4%*	*44.1%*	*40.9%*	*42.5%*	*44.5%*	*40.9%*	*42.0%*	*41.5%*	*42.1%*
Dividend Per Share	$3.58	$3.88	$4.04	$4.12	$1.04	$1.04	$1.07	$1.07	$4.22	$1.07	$1.07	$1.11	$1.11	$4.36
Dividend Growth	*10.5%*	*8.4%*	*4.1%*	*2.0%*	*0.0%*	*0.0%*	*2.9%*	*0.0%*	*2.4%*	*-74.6%*	*0.0%*	*4.0%*	*0.0%*	*3.3%*

YOY Growth	2013	2014	2015	2016	1Q17	2Q17	3Q17	4Q17E	2017E	1Q18E	2Q18E	3Q18E	4Q18E	2018E
Total Reported Volume (Cigs & HeatSticks)	**-5.1%**	**-2.8%**	**-1.0%**	**-3.2%**	**-9.4%**	**-5.0%**	**-0.5%**	**2.6%**	**-3.0%**	**3.1%**	**-0.9%**	**-2.1%**	**-3.6%**	**-1.0%**
Gross Revenue	3.4%	0.1%	-7.7%	1.4%	-1.4%	1.5%	3.5%	9.9%	3.5%	4.7%	4.3%	2.3%	-0.2%	2.7%
Excise Taxes	6.1%	3.1%	-6.4%	2.4%	-2.0%	0.1%	1.6%	4.4%	1.1%	2.2%	-1.2%	-3.1%	-4.1%	-1.7%
Net Revenue	-0.5%	-4.6%	-10.0%	-0.4%	-0.3%	4.0%	7.0%	19.6%	7.9%	9.0%	14.3%	12.0%	5.8%	10.1%
Net Revenue Ex Currency	**1.9%**	**2.1%**	**5.9%**	**4.4%**	**1.7%**	**7.0%**	**9.0%**	**17.5%**	**9.0%**	**6.4%**	**13.0%**	**13.4%**	**5.8%**	**9.6%**
Cost of Sales	0.4%	0.2%	-10.3%	0.3%	3.9%	6.6%	12.5%	21.8%	11.5%	7.2%	13.3%	7.1%	2.3%	7.2%
Gross Profit	-0.9%	-7.1%	-9.8%	-0.8%	-2.5%	2.6%	4.1%	18.4%	5.9%	10.0%	14.9%	14.8%	7.8%	11.8%
SG&A Expense	-0.9%	2.0%	-5.0%	-3.8%	-2.2%	9.4%	6.3%	14.2%	7.3%	3.4%	22.4%	29.9%	8.1%	15.8%
Operating Companies Income (OCI)	-1.1%	-10.5%	-12.4%	0.9%	-2.2%	-1.1%	2.2%	21.0%	4.9%	13.6%	10.5%	7.7%	7.9%	9.7%
OCI Ex Currency	**3.4%**	**-0.1%**	**6.6%**	**10.3%**	**-1.7%**	**5.9%**	**6.8%**	**16.0%**	**6.9%**	**8.7%**	**9.2%**	**9.7%**	**7.9%**	**8.9%**
Adj Net Earnings	-0.9%	-10.2%	-12.9%	1.4%	0.0%	-0.4%	1.7%	22.3%	5.8%	17.7%	12.4%	10.5%	8.6%	11.9%
Adj EPS	3.4%	-7.0%	-12.0%	1.4%	0.0%	-0.9%	1.6%	21.8%	5.6%	18.4%	13.2%	10.2%	9.0%	12.1%
Adj EPS Ex Currency	**10.0%**	**7.6%**	**11.8%**	**11.8%**	**0.0%**	**8.7%**	**11.2%**	**16.1%**	**9.3%**	**12.6%**	**11.7%**	**12.6%**	**9.0%**	**11.2%**
YOY Growth per Stick														
Gross Revenue	8.9%	2.9%	-6.8%	4.9%	8.9%	9.6%	1.8%	3.7%	5.9%	1.5%	2.0%	5.6%	3.6%	4.4%
Excise Taxes	11.7%	6.0%	-5.4%	5.8%	8.2%	5.5%	2.5%	4.8%	5.2%	3.3%	3.9%	3.2%	1.8%	2.9%
Net Revenue	4.8%	-1.9%	-9.1%	2.9%	10.1%	9.5%	7.5%	16.6%	11.3%	5.7%	15.3%	14.3%	9.8%	11.2%
Cost of Sales	5.7%	3.1%	-9.3%	3.6%	14.7%	12.2%	13.0%	18.7%	15.0%	3.9%	14.3%	9.3%	6.2%	8.3%
Gross Profit	4.3%	-4.5%	-8.9%	2.5%	7.6%	8.1%	4.6%	15.4%	9.2%	6.7%	15.9%	17.2%	11.9%	12.9%
SG&A Expense	4.4%	4.9%	-4.0%	-0.7%	8.0%	15.2%	6.8%	11.3%	10.7%	0.3%	23.5%	32.6%	12.2%	17.0%
Operating Companies Income (OCI)	4.2%	-8.0%	-11.5%	4.3%	8.0%	4.1%	2.7%	17.9%	8.2%	10.1%	11.5%	9.9%	11.9%	10.8%
Adj Net Earnings	4.4%	-7.6%	-12.0%	4.8%	10.4%	4.9%	2.2%	19.2%	9.1%	14.1%	13.4%	12.8%	12.7%	13.0%

Source: Wells Fargo Securities, LLC estimates

Price Target

Price Target: $135.00 from $140.00

Our $135 price target is based on a 17.7x forward EV/EBITDA multiple and a 25.5x forward P/E multiple, both slightly above its avg. historical multiples. Risks include f/x headwinds and a broad-based pullback in consumer spending.

Investment Thesis

We expect PM to outperform over the long term given: (1) iQOS, (2) a re-invigorated Marlboro brand franchise, (3) an industry-leading, diverse brand portfolio, and (4) an improving ROIC & economic profit. PM has emerged in a class of its own and we believe it is poised for further growth.

Company Description

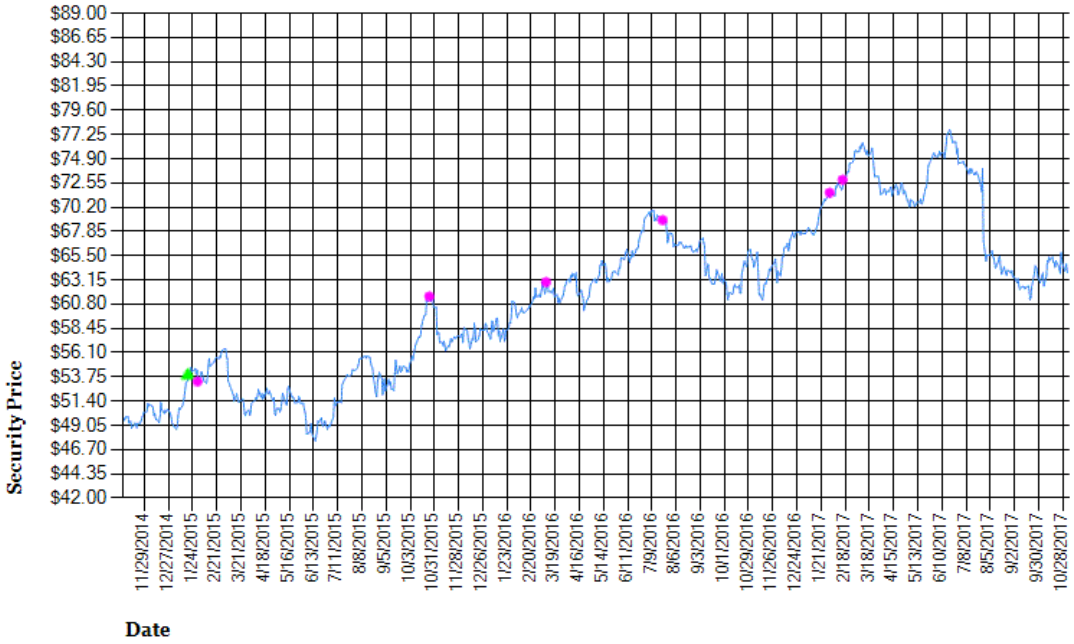
Philip Morris International is engaged in the manufacturing and marketing of cigarettes and other tobacco products outside of the United States. Headquartered in New York, the company has a wide range of premium, mid-price, and low-price brands, and its portfolio consists of both international and local brands. Philip Morris' leading brand Marlboro is the world's best-selling international cigarette. Philip Morris is also the leader in reduced risk products (RRPs) with its iQOS platform.

Rating Basis Information:

MO Thesis: We believe Altria is achieving a better balance between stabilizing Marlboro market share and growing profitably. We see further potential upside from strong pricing trends and potential of vapor/iQOS that isn't currently reflected in the stock.

Required Disclosures

Altria Group, Inc. (MO) 3-yr. Price Performance



	Date	Published Price ($)	Rating Code	Price Target	Val. Rng. Low	Val. Rng. High	Close Price ($)
	11/4/2014		Herzog				
	11/4/2014	NA	2	NE	46.00	48.00	49.42
▲●	1/20/2015	53.05	1	NE	56.00	58.00	53.83
●	1/30/2015	53.10	1	NE	59.00	61.00	53.10
●	10/26/2015	61.05	1	NE	64.00	66.00	61.40
●	3/9/2016	62.30	1	NE	69.00	71.00	62.81
●	7/22/2016	68.86	1	NE	73.00	75.00	68.86
●	2/1/2017	71.39	1	NE	76.00	78.00	71.39
●	2/16/2017	72.71	1	NE	79.00	81.00	72.71

Source: Wells Fargo Securities, LLC estimates and Reuters data

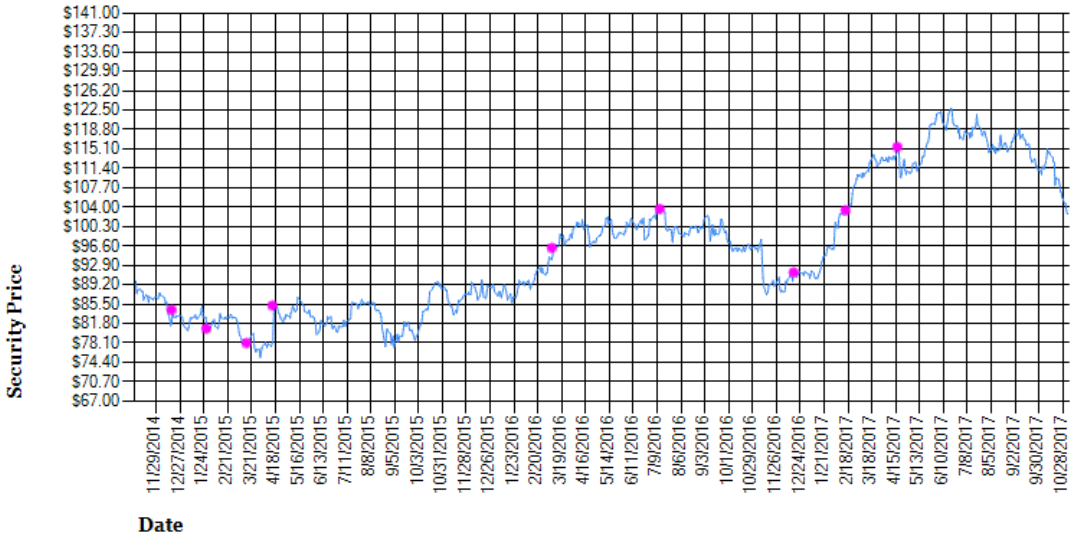
Symbol Key

- ▼ Rating Downgrade
- ▲ Rating Upgrade
- ● Price Target/Val Range Change
- ◆ Initiation, Resumption, Drop or Suspend
- ■ Analyst Change
- ❒ Split Adjustment

Rating Code Key

1	Outperform/Buy	SR	Suspended
2	Market Perform/Hold	NR	Not Rated
3	Underperform/Sell	NE	No Estimate

Philip Morris International Inc. (PM) 3-yr. Price Performance



Date	Published Price ($)	Rating Code	Price Target	Val. Rng. Low	Val. Rng. High	Close Price ($)
11/4/2014		Herzog				
11/4/2014	NA	1	NE	92.00	94.00	89.45
12/18/2014	84.02	1	NE	91.00	93.00	84.02
1/28/2015	80.58	1	NE	88.00	90.00	80.58
3/17/2015	77.89	1	NE	87.00	89.00	77.89
4/16/2015	84.96	1	NE	94.00	96.00	84.96
3/9/2016	94.45	1	NE	109.00	111.00	96.01
7/13/2016	103.24	1	NE	114.00	116.00	103.24
12/18/2016	91.31	1	NE	109.00	111.00	91.31
2/16/2017	102.99	1	NE	114.00	116.00	102.99
4/18/2017	114.74	1	NE	139.00	141.00	115.21

Source: Wells Fargo Securities, LLC estimates and Reuters data

Symbol Key

- Rating Downgrade
- Rating Upgrade
- Price Target/Val Range Change
- Initiation, Resumption, Drop or Suspend
- Analyst Change
- Split Adjustment

Rating Code Key

1	Outperform/Buy	SR	Suspended
2	Market Perform/Hold	NR	Not Rated
3	Underperform/Sell	NE	No Estimate

Additional Information Available Upon Request

I certify that:
1) All views expressed in this research report accurately reflect my personal views about any and all of the subject securities or issuers discussed; and
2) No part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by me in this research report.

- Wells Fargo Securities, LLC and/or its affiliates, have beneficial ownership of 0.5% or more of any class of the common stock of Altria Group, Inc., Philip Morris International Inc..
- Altria Group, Inc. currently is, or during the 12 month period preceding the date of distribution of the research report was, a client of Wells Fargo Securities, LLC. Wells Fargo Securities, LLC provided investment banking services to Altria Group, Inc..
- Wells Fargo Securities, LLC or its affiliates received compensation for investment banking services from Altria Group, Inc. in the past 12 months.
- Wells Fargo Securities, LLC, or any of its affiliates, intends to seek or expects to receive compensation for investment banking services from Altria Group, Inc. in the next three months.
- Wells Fargo Securities, LLC maintains a market in the common stock of Altria Group, Inc., Philip Morris International Inc..

- Wells Fargo Securities, LLC received compensation for products or services other than investment banking services from Altria Group, Inc. in the past 12 months.
- Altria Group, Inc. currently is, or during the 12-month period preceding the date of distribution of the research report was, a client of Wells Fargo Securities, LLC. Wells Fargo Securities, LLC provided non-investment banking securities-related services to Altria Group, Inc..
- A member of Research Management currently has a long position in the securities of Philip Morris International Inc..
- Wells Fargo Securities, LLC or its affiliates has a significant financial interest in Altria Group, Inc., Philip Morris International Inc..

MO: Risks include increased price competition and increased downtrading by consumers.
PM: Risks include f/x headwinds and a broad-based pullback in consumer spending.

Wells Fargo Securities, LLC does not compensate its research analysts based on specific investment banking transactions. Wells Fargo Securities, LLC's research analysts receive compensation that is based upon and impacted by the overall profitability and revenue of the firm, which includes, but is not limited to investment banking revenue.

STOCK RATING
1=Outperform: The stock appears attractively valued, and we believe the stock's total return will exceed that of the market over the next 12 months. BUY
2=Market Perform: The stock appears appropriately valued, and we believe the stock's total return will be in line with the market over the next 12 months. HOLD
3=Underperform: The stock appears overvalued, and we believe the stock's total return will be below the market over the next 12 months. SELL

SECTOR RATING
O=Overweight: Industry expected to outperform the relevant broad market benchmark over the next 12 months.
M=Market Weight: Industry expected to perform in-line with the relevant broad market benchmark over the next 12 months.
U=Underweight: Industry expected to underperform the relevant broad market benchmark over the next 12 months.

VOLATILITY RATING
V = A stock is defined as volatile if the stock price has fluctuated by +/-20% or greater in at least 8 of the past 24 months or if the analyst expects significant volatility. All IPO stocks are automatically rated volatile within the first 24 months of trading.

As of: November 15, 2017

44% of companies covered by Wells Fargo Securities, LLC Equity Research are rated Outperform.	Wells Fargo Securities, LLC has provided investment banking services for 45% of its Equity Research Outperform-rated companies.
53% of companies covered by Wells Fargo Securities, LLC Equity Research are rated Market Perform.	Wells Fargo Securities, LLC has provided investment banking services for 31% of its Equity Research Market Perform-rated companies.
2% of companies covered by Wells Fargo Securities, LLC Equity Research are rated Underperform.	Wells Fargo Securities, LLC has provided investment banking services for 24% of its Equity Research Underperform-rated companies.

Important Disclosure for International Clients
EEA – The securities and related financial instruments described herein may not be eligible for sale in all jurisdictions or to certain categories of investors. For recipients in the EEA, this report is distributed by Wells Fargo Securities International Limited ("WFSIL"). WFSIL is a U.K. incorporated investment firm authorized and regulated by the Financial Conduct Authority. For the purposes of Section 21 of the UK Financial Services and Markets Act 2000 ("the Act"), the content of this report has been approved by WFSIL a regulated person under the Act. WFSIL does not deal with retail clients as defined in the Markets in Financial Instruments Directive 2007. The FCA rules made under the Financial Services and Markets Act 2000 for the protection of retail clients will therefore not apply, nor will the Financial Services Compensation Scheme be available. This report is not intended for, and should not be relied upon by, retail clients.

Australia – Wells Fargo Securities, LLC is exempt from the requirements to hold an Australian financial services license in respect of the financial services it provides to wholesale clients in Australia. Wells Fargo Securities, LLC is regulated under U.S. laws which differ from Australian laws. Any offer or documentation provided to Australian recipients by Wells Fargo Securities, LLC in the course of providing the financial services will be prepared in accordance with the laws of the United States and not Australian laws.

Canada – This report is distributed in Canada by Wells Fargo Securities Canada, Ltd., a registered investment dealer in Canada and member of the Investment Industry Regulatory Organization of Canada (IIROC) and Canadian Investor Protection Fund (CIPF). Wells Fargo Securities, LLC's research analysts may participate in company events such as site visits but are generally prohibited from accepting payment or reimbursement by the subject companies for associated expenses unless pre-authorized by members of Research Management.

Hong Kong – This report is issued and distributed in Hong Kong by Wells Fargo Securities Asia Limited ("WFSAL"), a Hong Kong incorporated investment firm licensed and regulated by the Securities and Futures Commission of Hong Kong ("the SFC") to carry on types 1, 4, 6 and 9 regulated activities (as defined in the Securities and Futures Ordinance (Cap. 571 of The Laws of Hong Kong), "the SFO"). This report is not intended for, and should not be relied on by, any person other than professional investors (as defined in the SFO). Any securities and related financial instruments described herein are not intended for sale, nor will be sold, to any person other than professional investors (as defined in the SFO). The author or authors of this report is or are not licensed by the SFC. Professional investors who receive this report should direct any queries regarding its contents to Mark Jones at WFSAL (email: wfsalresearch@wellsfargo.com).

Japan – This report is distributed in Japan by Wells Fargo Securities (Japan) Co., Ltd, registered with the Kanto Local Finance Bureau to conduct broking and dealing of type 1 and type 2 financial instruments and agency or intermediary service for entry into investment advisory or discretionary investment contracts. This report is intended for distribution only to professional investors (Tokutei Toushika) and is not intended for, and should not be relied upon by, ordinary customers (Ippan Toushika).

The ratings stated on the document are not provided by rating agencies registered with the Financial Services Agency of Japan (JFSA) but by group companies of JFSA-registered rating agencies. These group companies may include Moody's Investors Services Inc., Standard & Poor's Rating Services and/or Fitch Ratings. Any decisions to invest in securities or transactions should be made after reviewing policies and methodologies used for assigning credit ratings and assumptions, significance and limitations of the credit ratings stated on the respective rating agencies' websites.

About Wells Fargo Securities

Wells Fargo Securities is the trade name for the capital markets and investment banking services of Wells Fargo & Company and its subsidiaries, including but not limited to Wells Fargo Securities, LLC, a U.S. broker-dealer registered with the U.S. Securities and Exchange Commission and a member of NYSE, FINRA, NFA and SIPC, Wells Fargo Prime Services, LLC, a member of FINRA, NFA and SIPC, Wells Fargo Securities Canada, Ltd., a member of IIROC and CIPF, Wells Fargo Bank, N.A. and Wells Fargo Securities International Limited, authorized and regulated by the Financial Conduct Authority.

This report is for your information only and is not an offer to sell, or a solicitation of an offer to buy, the securities or instruments named or described in this report. Interested parties are advised to contact the entity with which they deal, or the entity that provided this report to them, if they desire further information. The information in this report has been obtained or derived from sources believed by Wells Fargo Securities, LLC, to be reliable, but Wells Fargo Securities, LLC does not represent that this information is accurate or complete. Any opinions or estimates contained in this report represent the judgment of Wells Fargo Securities, LLC, at this time, and are subject to change without notice. All Wells Fargo Securities research reports published by its Global Research Department ("WFS Research") are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Additional distribution may be done by sales personnel via email, fax or regular mail. Clients may also receive our research via third party vendors. Not all research content is redistributed to our clients or available to third-party aggregators, nor is WFS Research responsible for the redistribution of our research by third party aggregators. For research or other data available on a particular security, please contact your sales representative or go to http://www.wellsfargoresearch.com. For the purposes of the U.K. Financial Conduct Authority's rules, this report constitutes impartial investment research. Each of Wells Fargo Securities, LLC and Wells Fargo Securities International Limited is a separate legal entity and distinct from affiliated banks.

SECURITIES: NOT FDIC-INSURED/NOT BANK-GUARANTEED/MAY LOSE VALUE

Appendix D

LEGACY
FOR LONGER HEALTHIER LIVES

1724 Massachusetts Avenue, NW
Washington, DC 20036
202-454-5555
www.LegacyForHealth.org

November 22, 2013

Margaret Hamburg, MD
Commissioner
Food and Drug Administration
ATTN: Division of Dockets
Management (HFA–305)
5630 Fishers Lane, Rm 1061
Rockville, MD 20852

Mitch Zeller, JD
Director, Center for Tobacco Products
Food and Drug Administration
9200 Corporate Boulevard
Rockville, MD 20850

RE: Docket no. FDA-2013-N-0521 – Advance notice of Proposed Rulemaking – Menthol in Cigarettes, Tobacco Products; Request for Comments

Dear Dr. Hamburg and Mr. Zeller:

Legacy strongly believes the Food and Drug Administration (FDA) must ban menthol as a characterizing flavor in cigarettes to protect public health. Legacy has been a leader in the effort to remove menthol as a characterizing flavor from cigarettes and other tobacco products since the passage of the Family Smoking Prevention and Tobacco Control Act (Tobacco Control Act). We have produced and presented strong scientific evidence to both FDA and the Tobacco Products Scientific Advisory Committee (TPSAC) while TPSAC investigated the science on menthol in cigarettes and developed their report that concluded "removal of menthol cigarettes from the market would benefit public health in the United States."[1] After FDA made the unusual decision following the TPSAC report to conduct its own internal scientific review and have it peer reviewed, the public waited more than two years for the release of that report and any subsequent action from FDA.[2] In the meantime, we have joined 19 other groups in signing a Citizen's Petition to FDA urging a ban on menthol in cigarettes.[3] While we appreciate the opportunity to provide more information at this time, we deplore the delay in getting to this point, and urge FDA to take immediate steps to remove menthol from the market. Any further delay only serves to endanger thousands of lives.

As part of our comment, we incorporate all previous comments Legacy has submitted regarding menthol, to assure that they are formally on the record for this docket and for any rulemaking that may arise out of this Advance Notice of Proposed Rulemaking (ANPRM) and request for information. Those submissions are included in Appendix A. Additionally, we have included copies of several recently released papers in scientific journals that are relevant to menthol regulation. Those submissions are included in Appendix B.

These comments will focus – again – on explaining in detail that FDA already has the scientific evidence required under the Tobacco Control Act to ban menthol as a characterizing flavor in tobacco products; adding additional scientific evidence that has been developed since our last submission; and answering the specific questions posed in the ANPRM. While Legacy believes that any additives that contribute to encouraging youth to initiate tobacco products, prevent tobacco users from quitting, or otherwise harm public health should be removed from all tobacco products, given the scope of

the ANPRM, these comments are limited to the question of menthol as a characterizing flavor in cigarettes. We thank you for your careful consideration of our comments.

Table of Contents

Introduction

Menthol has been added to tobacco products as a characterizing flavor since at least the 1920s, but many of the current menthol brands were introduced in the mid-1950s.[4,5] In 2011, the most recent year for which we have data, menthol cigarettes represented 32% of the cigarette market, up from 22% in 2010.[6] Importantly, a recent study shows that while non-menthol cigarette prevalence declined from 2004-2010, menthol cigarette prevalence has remained stable.[7] The presence of menthol cigarettes on the market appears to be impeding progress in reducing smoking prevalence over all.

The Tobacco Control Act banned all candy and fruit flavors as characterizing flavors of cigarettes. The law did not include menthol in that ban, nor did it address flavors in non-cigarette tobacco products.[8] However, the Tobacco Control Act required TPSAC, as its first order of business, to review the state of the science on

menthol and make a recommendation to the FDA,.[9] TPSAC complied, undertaking an exceedingly thorough review of the science. It issued a comprehensive report concluding that it would be in the interest of public health to remove menthol cigarettes from the market.[1]

While the law did not include menthol in the ban on flavors, it makes clear that this does not preclude FDA from issuing a product standard to ban menthol in cigarettes, or any other tobacco product to protect public health. Indeed, the fact that FDA has this authority is mentioned twice in the Act. Nonetheless, after TPSAC submitted its report to FDA, the agency then took the unusual step of conducting a second, internal review of the science, which it submitted for peer review. This report concluded, that its findings "make it likely that menthol cigarettes pose a public health risk above that seen with nonmenthol cigarettes."[10] FDA now has two separate scientific reviews with the same conclusion. Legacy adds a third exhaustive review, including more recent data supporting these conclusions. We urge FDA to act on this evidence immediately and issue a product standard banning menthol.

The Statutory Framework for Product Standards

Since the traditional "safe and effective" standard for the regulation of drugs and devices is plainly inappropriate for tobacco products – given that they cause death and disease when used as intended – the Tobacco Control Act established a new standard for regulating tobacco products: the public health standard. Under this standard, FDA must not only take into consideration the impact a tobacco product standard would have on individual health, but FDA must also consider the impact on the population as a whole, including users and non-users of tobacco.[11] Congress designed the new public health standard..."to be a flexible standard that focuses on the overall goal of reducing the number of individuals who die or are harmed by tobacco products."[12]

More specifically, the standard calls for the review of the scientific evidence regarding

(1) the risks and benefits of the tobacco product standard to the population as a whole, including both users and non-users of tobacco products;
(2) whether there is an increased or decreased likelihood that existing users of tobacco products will stop using such products and
(3) whether there is an increased or decreased likelihood that those who do not currently use tobacco products, most notably youth, will start to use tobacco products.[11]

The touchstones of the public health standard are (1) the "likely" impacts of a product standard on users and non-users of tobacco products across the population as a whole; and (2) an assessment of the risks and benefits of the standard, again across the population as a whole, including both users and non-users of tobacco products. As such, the analysis of whether a product standard meets the public health standard is distinct from the traditional assessment of risk factors for disease as most notably set out in the Surgeon General's Report on the Health Consequences of Smoking chapter on "Issues in Statistical and Causal Inference."[13] Indeed TPSAC acknowledged this in its report stating:

> "TPSAC reviewed the [the 2004 Surgeon General's report] approach, which involves the systematic evaluation of evidence to reach a conclusion with regard to disease causation. TPSAC's charge for menthol cigarettes extends beyond disease causation, however, and TPSAC needs to reach conclusions on diverse issues…"[1]

The emphasis under the public health standard is properly on the strength of the likely relationships between the proposed standard and population-wide health outcomes and not on a particular model of proving "causation."

Moreover, given the clear statutory focus on population-wide impacts, and contrary to the repeated assertions of the tobacco industry, the fact that the evidence does not establish that menthol cigarettes pose a higher risk to the health of the individual smoker is by no means dispositive. TPSAC agreed on this point as well, stating:

> "It is important to note that disease is not the primary or sole outcome that determines the public health impact of menthol cigarettes. The availability of menthol cigarettes could have no significant effect on risk for disease outcomes, yet have a significant effect on increasing initiation or reducing the success of cessation. The resultant increase in the prevalence of smoking would represent a negative public health impact."[1]

The clear weight of the scientific evidence, as summarized below, shows that (1) there is a strong relationship between menthol cigarettes and youth initiation, increasing the overall smoking prevalence rates in the country; (2) menthol smokers are more nicotine dependent, and have a more difficult time quitting than non-menthol cigarette smokers, thus reducing tobacco cessation across the population; and (3) menthol cigarettes are smoked at higher rates by minorities, including African Americans and Hispanics, and women.

Evidence Review and Classification

The review of the scientific evidence related to the risks, benefits and likely results of an FDA ban on menthol flavoring in cigarettes, as presented in this comment, follows the recommendations for evidence review and classification presented by Jon Samet at the October 7, 2010 TPSAC meeting.

First, with regard to the sources of evidence, we have undertaken a systematic review of the peer-reviewed literature. We started with the National Cancer Institute's Bibliography of Literature on Menthol and Tobacco,[14] reviewed references cited in the FDA's original 2011 report[10] and 2013 addendum,[15] and conducted an additional search in PubMed on September 4, 2013 using the terms ("menthol" AND cigarette*) to capture articles published after FDA's March 2013 review. Since Legacy researchers have been actively engaged in research related to menthol cigarettes, we also provide relevant data from our peer-reviewed publications, conference presentations, and unpublished manuscripts to inform the FDA's rulemaking on menthol.[i] While we provide context for some of our findings with tobacco industry and related documents and published reviews of tobacco industry documents, we did not complete a comprehensive search of the publicly available tobacco industry documents.

Second, in reviewing the scientific literature we have been guided by broadly accepted standards of evidence synthesis. In reviewing and evaluating available published epidemiologic studies on tobacco use among adults and youth, we:

(1) Examined the methods and designs of the studies, the rigor with which they were conducted, and the limits of interpreting data with respect to the population, place, and time of the study;
(2) Categorized individual studies according to their methods and design and evaluated studies that used comparable methods to determine consistency of the evidence across populations and over time. We examined evidence across these comparable studies to assess the strength of the association and to determine if a temporal relationship was present between menthol cigarette use and smoking initiation or cessation;
(3) Looked at the body of scientific evidence to determine whether findings of individual studies were coherent with each other and with our broader understanding of tobacco use in the United States; and
(4) Considered the plausibility of these findings in the context of tobacco industry and related documents.

Third, we asked whether positive associations exist and whether chance, bias, and confounding could be ruled out with reasonable confidence. In keeping with a classification scheme based on the likelihood standard, and recognizing that decision-makers must often act in the face of scientific uncertainty, we asked whether the evidence is sufficient to conclude that a relationship was more likely than not, whether the evidence shows that a relationship was at least as likely as not, whether the evidence is insufficient to conclude that a relationship was more likely than not, or whether there was insufficient evidence to make a determination of strength of evidence. The second category – evidence suggestive but not dispositive of an

[i] We highlight these findings throughout using red italic text. Due to copyright issues, we request that these findings be redacted from the version of our comments made available to the public.

association – would come into play, for example, in the presence of some inconsistency in study results or studies where chance, bias and confounding could not be ruled out with confidence. Mindful of the fact that the Tobacco Control Act standard is framed in terms of risks, benefits and likelihoods, and not certainty, we believe that the scientific evidence regarding the relationship between menthol and both initiation and cessation is sufficient to conclude that relationships are more likely than not.

Finally, consistent with the statutory framework and as we explain above, our review focused on the likely impact of a menthol ban on a broad population-wide basis, rather than on a more narrow impact on current menthol users at the individual level. As a result, our findings focus on the relationships between menthol cigarette use and initiation, cessation, nicotine dependence, and marketing. While considering the strength of the evidence, we stayed mindful of the public health purposes of the Tobacco Control Act and the precept that it should be broadly construed to achieve its remedial purposes.[16]

The Scientific Evidence Supports the Issuance of a Product Standard Banning Menthol Under the Public Health Standard

Our review of the scientific evidence complements the reviews conducted by the FDA's Tobacco Products Scientific Advisory Committee (TPSAC) and FDA itself, adding further support to the conclusions that it is more likely than not that:

- Menthol flavoring in cigarettes is associated with youth smoking and initiation;
- Menthol flavoring in cigarettes is associated with increased nicotine dependence in young smokers;
- Menthol flavoring in cigarettes decreases smoking cessation in adult smokers;
- Targeted marketing of menthol cigarettes is associated with greater menthol cigarette use in specific populations; and
- Prohibiting menthol as a cigarette flavoring would result in (a) reduced smoking initiation; (b) increased smoking cessation; and (c) a significant reduction in the number of Americans who die or are harmed from tobacco products.

The Scientific Evidence on Menthol and Youth Smoking Demonstrates a Likelihood That a Ban on Menthol Will Result in Lower Rates of Youth Smoking Initiation

The data are clear: young smokers and new young smokers smoke menthol cigarettes at significantly higher rates than young adults and adult smokers. Additionally, the prevalence of menthol cigarette use has remained stable in youth and adults over the age of 26 and increased in young adults in the past decade, despite significant decreases in non-menthol cigarette use over the same time period in all three age groups. Consistent results from large representative national surveys have confirmed these findings over time and in different populations and are unlikely to be due to chance, confounding, or bias. Our recent study in *Tobacco Control* shows that the presence of menthol cigarettes in the marketplace is slowing progress in the reduction of population smoking prevalence.[7]

Since completion of the TPSAC and FDA reports, longitudinal studies have been published showing that recognition of the most popular menthol brand (Newport) is associated with smoking experimentation in adolescents and initiation with menthol cigarettes is strongly associated with progression to established smoking among adolescents. Consistent with the findings of cross-sectional studies and tobacco industry documents, these studies strengthen the evidence on the role of menthol cigarettes as a starter product for young smokers and bolster the TPSAC and FDA conclusions that menthol cigarettes increase experimentation and progression to regular smoking. More particularly:

- **The prevalence of menthol cigarette use is higher in youth than young adults and adults.**

A 2013 Legacy study using six years of data (2004-2010) from the National Survey on Drug Use and Health (NSDUH), with large representative sample sizes in the range of 70,000 annual interviews and adjusted for misclassification of menthol brand, shows that from 2008-10, 56.7% of youth smokers (aged 12-17) smoked menthol cigarettes.[7] This compares with an overall menthol cigarette prevalence (youth and adults) of 35.2 % and represents 1.2 million menthol smoking youth. Controlling for gender, race/ethnicity, household income and days smoked in the past month, the odds of smoking mentholated brands were nearly fourfold higher in the youngest age groups (12–15 and 16–17) of smokers compared to smokers aged 35 and older. These estimates are slightly higher than those published in the 2009 *NSDUH Report: Use of Menthol Cigarettes*[17] and NSDUH analyses by Caraballo and Asman[18] and Rock et al.,[19] but account for two more years of data collection and adjustment for misclassification of menthol status. Together, these studies demonstrate the stability of these nationally-representative estimates over seven years highlighting higher rates of menthol use in youth compared to adults from 2004-2010.

- **Menthol cigarette use is significantly higher in younger adolescents than older adolescents.** Estimates from the National Youth Tobacco Survey (NYTS), a survey administered to approximately 25,000 middle and high school students in each wave, demonstrate increased rates of menthol use among younger adolescent smokers. Results from the 1999, 2000, and 2002 surveys confirm a statistically significantly higher prevalence of menthol cigarette use among middle school students compared to high school students.[20-22] In the 2006 NYTS, 57.1% of middle school smokers reported that their usual brand was menthol compared to 43.1% of high school smokers.[23] Data combined for years 2004, 2006, and 2009 of the NYTS showed that 49.4% of middle school current smokers reported smoking menthol cigarettes compared to 44.9% of high school current smokers.[18] The finding that menthol cigarette use is higher among younger adolescents than older adolescents is strengthened by replication across ten years of data from a large, nationally-representative sample of youth.

- **Menthol cigarette use among youth has not decreased in the past decade, despite decreases in non-menthol cigarette use.**
  The recent paper by Giovino et al. using NSDUH data provides strong evidence that the prevalence of smoking menthol cigarettes remained constant among youth (aged 12-17) from 2004-2010, at the same time that the prevalence of non-menthol cigarette use decreased significantly in this age group.[7] Furthermore, the authors report that menthol cigarette use significantly increased over this time period in young adults (aged 18-25) while the prevalence of non-menthol cigarette use decreased significantly. These findings were also reported in unadjusted NSDUH data in the 2011 report on *Recent Trends in Menthol Cigarette Use.*[24] Among all youth and young adults, not just current smokers, the prevalence of smoking non-mentholated brands decreased from 2004-2010, while the prevalence of smoking mentholated brands remained constant or increased among youth and young adults over this period, indicating that menthol cigarettes are gaining market share in these age groups.

- **Recent youth initiates are significantly more likely to use menthol cigarettes than youth who have smoked longer than one year.**
  Estimates from the NYTS and NSDUH also demonstrate increased menthol cigarette use among recent youth initiates. Two studies[17,25] combining waves of national data on youth smoking report a higher prevalence of menthol cigarette use among youth who have been smoking less than one year compared to those who have smoked more than one year. One of the studies combined data from five years of the NSDUH (2004-2008) and the other used two years of data from the NYTS (2000 and 2002). In the NSDUH study, past month smoking of menthol cigarettes was more likely among smokers aged 12-17 who began smoking in the past 12 months than among those who had been smoking for more than a year (49.2% vs. 43.8%); findings were similar in young adults where past-year initiates had higher menthol use than longer-term smokers (40.2% vs. 36.4%).[17] The 2011 NSDUH report on menthol also reported that the prevalence of menthol use in recent initiates among

all participants aged 12+ increased during 2007-2010 as compared to 2004-2006 and that past month menthol use was higher among recent initiates compared to longer-term smokers in both time periods.[24] In the NYTS study, middle school students who had been smoking for less than 1 year were significantly more likely to smoke menthol cigarettes compared with middle school students who had been smoking for more than 1 year (62.4% vs. 53.3%, p = 0.002).[25] Two recent analyses in the NYTS data[18,23] did not find a significant relationship between menthol cigarette use and smoking initiation among adolescents. One study using 2006 NYTS data shows that the proportion of middle school smokers whose usual brand was menthol was higher among those who smoked for 1 year or more (54.7%) than among those who smoked for less than a year (42.2%).[23] Among high school youth, these percentages were similar for smokers who had smoked for less than and for more than 1 year (42.8% vs. 43.1%). While the differences in menthol use by time since initiation were not statistically significant in this study, the large difference in menthol use among middle school students does indicate that younger, newer smokers are more likely to use menthol cigarettes. Another study combining data across years of the NYTS (2004, 2006, and 2009) used cigarettes smoked per day and days smoked per month as proxy measures for early "stages" of use (initiation) and showed no difference in the prevalence of menthol use by "stage."[18] However, this study assessed "stage" as number of cigarettes per day and days smoked per month and used cross-sectional rather than longitudinal data to document smoking progression. Given variation in trajectories of smoking among adolescents and the need for longitudinal data to explore changes in smoking behavior over time, the definition of "stage" in this study may not characterize true progression of cigarette use in youth.

- **Longitudinal studies demonstrate that initiation with menthol cigarettes facilitates progression to established use in young smokers.** The cross-sectional nature of the national surveys described above precludes a determination as to whether there is a temporal relationship between menthol and youth initiation. However, subsequent to the TPSAC and FDA reports, two longitudinal studies have been conducted to assess the impact of menthol initiation on smoking behavior. The first, published by Nonnemaker et al.[26] documents that adolescents who initiated smoking with menthol cigarettes during the course of a cohort study were more likely to progress to established smoking by the end of the three-year study compared to those who initiated with non-menthol cigarettes. The stringency of the definition of "established smoking" in this study (i.e., at least 100 cigarettes lifetime plus smoking on 20-30 of the past 30 days) provides strong evidence for the relationship between menthol cigarette use and progression to regular use given the typical adolescent definition of current cigarette use as any use in the past 30 days. The second, published by Dauphinee et al.[27] shows that recognition of Newport cigarettes, a leading menthol brand, was associated with smoking experimentation in a large sample of adolescent never-smokers at 12-month follow-up.

- **Young smokers are likely to remain with their "starter" type of cigarette over time.** In the Nonnemaker et al. study, the majority of adolescent smokers who initiated with menthol cigarettes remained menthol smokers at wave 3 (63%); this was similar to the proportion of adolescent smokers who initiated with non-menthol cigarettes and remained with non-menthol smokers at wave 3 (62%).[26] Data from the National Youth Smoking Cessation Survey (NYSCS), a two-year (2003-2005) longitudinal telephone study of adolescent and young adult cigarette smokers aged 16-24 confirm that 85% of baseline menthol smokers remained menthol smokers at 24 months and 93% of baseline nonmenthol smokers remained nonmenthol smokers. *Unpublished data from the Legacy Young Adult Cohort Study bolsters the findings that the majority of young adult smokers, aged 18-34, remain with their initial type of cigarette; in this study, 77% of young adults who initiated with a non-menthol cigarette remained a non-menthol smoker at one year (three waves) of follow-up, compared to 80% of young adults who initiated with a menthol cigarette remaining menthol smokers across all waves.*

- **Longitudinal data of switching behavior shows that menthol may initially attract young smokers to cigarettes or facilitate their continued use.**
  Longitudinal evidence on differential switching between menthol and nonmenthol cigarettes in young smokers is mixed, but points to two possible explanations: 1) Menthol cigarettes are a starter product for youth and young adults, or 2) the attractiveness of menthol cigarettes facilitates continued smoking in young people. Data from the National Youth Smoking Cessation Survey (NYSCS), a two-year (2003-2005) longitudinal telephone study of adolescent and young adult cigarette smokers aged 16-24 show that brand switching from menthol to non-menthol cigarettes is more prevalent than switching from non-menthol to menthol cigarettes.[28] In this study of approximately 1,000 young smokers, 15.0% (95% CI: 10.8% - 19.2%) of baseline menthol smokers switched to non-menthol varieties after 2 years and 6.9% (95% CI: 4.9% – 8.9%) of baseline non-menthol smokers switched to mentholated cigarettes after 2 years. The differences in switching were especially noticeable for non-Hispanic whites and for those who were in college or had graduated from college at the time of the baseline survey. These data provide strong evidence that younger smokers are more likely to begin their smoking careers with mentholated products and progress to smoking non-mentholated varieties in a short period of time. This lends further credence to evidence on menthol as a starter product for young smokers.[25] *On the other hand, unpublished data from the Legacy Young Adult Cohort Study in 2011-2012 shows that brand switching in young adulthood (ages 18-34) may be more common from non-menthol to menthol cigarettes (17%) than from menthol to nonmenthol cigarettes (7%) in young adults who remain smokers through one year (three waves) of follow-up. Those who switched from non-menthol to menthol were more likely to be non-white, smoke with others, and score higher on the Allen menthol taste subscale[29] compared to those who remained nonmenthol smokers over the study period.* This is in line with our previous research showing high menthol cigarette use among young adults[7] and brand preference for menthol cigarettes in this age group.[30]

- **The findings regarding an age gradient in menthol cigarette use – increased levels of menthol smoking in the youngest age groups -- are not attributable to menthol brand misclassification or socioeconomic status.** At the July 2010 TPSAC meeting, tobacco industry presentations criticized the classification of menthol smokers by the NSDUH survey. Tobacco control researchers have also raised the notion that menthol cigarette use may be associated with economic pressure to use fewer cigarettes,[31] thus menthol use may be due to lower socioeconomic status. Giovino et al. reanalyzed the NSDUH data to address potential misclassification of menthol brand and confirmed the earlier results, showing a persistent age gradient in menthol cigarette use across gender, race/ethnicity, household income, and number of days smoked per month.[7] Multivariable analyses showed that the odds of smoking mentholated brands were highest in the youngest age groups (12–15 and 16–17) of smokers, after controlling for gender, race/ethnicity, household income and days smoked per month. These data bolster published results from the NSDUH survey showing that youth are more likely to smoke menthol than older adults and establish that these results are not an artifact of misclassification of menthol use.[20] They also highlight that use of menthol cigarettes among youth is not explained by socioeconomic status, assessed as household income.

- **The Tobacco Industry has long understood the appeal of menthol cigarettes as starter products for youth.** Historical tobacco industry documents underscore menthol brands as starter products for youth (i.e., "Menthol brands have been said to be good starter products because new smokers appear to know that menthol covers up some of the tobacco taste and they already know what menthol tastes like, vis-à-vis candy"[32]) and recognize the importance of adolescent smokers to the success of menthol brands (i.e., "The success of Newport has been fantastic during the past few years. Our profile taken locally shows this brand being purchased by black people (all ages), young adults (usually college age), but the base of our business is the high school student"[33]). Recent tobacco industry document reviews have also underscored the relationship between menthol cigarette use, youth smoking initiation and tobacco dependence, as understood and manipulated by the tobacco industry.[34-36] Data from financial analysts support that the menthol marketplace is strongly influenced by youth smoking. Tobacco industry experts at Morgan Stanley noted in 2012 that

> menthol cigarettes continue to have a higher market share in younger age groups, despite the fact that youth smoking continues to decline.[37]

In sum, over ten years of national studies of tobacco use across different populations and time periods arrive at the same conclusions: there is a strong pattern of a higher – and growing – proportion of menthol cigarette use among youth (aged 12-17) than adults, and especially among younger adolescents and recent youth initiates. The results from large, representative studies provide evidence of an association between menthol and youth smoking that is robust and consistent in magnitude and direction and is unlikely to be due to bias, confounding, or chance.

More particularly, the replication of these findings over time using different studies and populations provides evidence of consistency. The increasing prevalence of youth menthol use and brand preference demonstrated across the years of the NSDUH, NYTS, and Robert Wood Johnson Foundation studies underscores the strength of the relationship between menthol and youth smoking. Data showing a high prevalence of menthol use among youth, in addition to higher prevalence among younger adolescents and recent initiates, and stable or increasing menthol cigarette use over time – despite reductions in non-menthol cigarette use – supports coherence of the evidence on menthol and youth smoking. Plausibility of the relationship between menthol and youth smoking is corroborated by historic industry and related documents on the development and marketing of mentholated cigarettes to youth.[32,33] The magnitude and statistical significance of the data on the increasing proportion of menthol use and brand preference among youth over time reveals that this is a national phenomenon.

The statistically significant 17% difference in menthol use among middle school students compared to high school students demonstrates that the association between menthol use and recentness of smoking initiation among youth is unlikely to be due to chance or confounding. Additional analyses conducted by our group also exclude misclassification and socioeconomic status as explanations for the high prevalence of menthol cigarette use among youth.

As noted by Caraballo and Asman, “it is important to clarify that the age of a smoker and smoking initiation is not equivalent.”[18] Therefore, studies documenting a lower – or higher – age of initiation among menthol smokers do not address the question of whether menthol cigarettes influence smoking initiation. While the cross-sectional nature of the national surveys precludes a determination as to whether there is a temporal relationship between menthol and youth initiation—a finding by no means necessary to establish a cognizable relationship—evidence from recent longitudinal studies demonstrates a temporal relationship between initiation with menthol cigarettes and progression to regular use among young smokers, as well as the increased likelihood of experimentation in adolescence with menthol cigarettes after exposure to menthol marketing.

Thus, a careful review of the body of evidence clearly demonstrates evidence of a relationship between menthol cigarettes and increased youth smoking initiation, or, otherwise stated, the existence of a relationship between menthol cigarettes and youth smoking initiation is more likely than not. Given the strong and established pattern of menthol use by the youngest and newest smokers, it is more likely than not that a ban on menthol will result in lower rates of youth smoking initiation. There is no experiment that can be undertaken in advance of an actual ban to test or otherwise indicate what proportion of youth and young adults would be prevented from smoking as a result of a ban. However, these data persuasively suggest that fewer youth will start to smoke if menthol products are not available to them. As discussed in greater detail in the section below on risks and benefits, even a small percentage reduction in youth initiation would result in a cumulative and very significant public health benefit, given the overwhelming harms caused by cigarette smoking and the fact that the great majority of smokers initiate when they are teenagers.

The Scientific Evidence on Menthol in Cigarettes Demonstrates a Likelihood That a Ban on Menthol Will Result in Fewer Nicotine Dependent Smokers

The recent FDA evidence synthesis and addendum confirm that the evidence supports the general conclusion that menthol in cigarettes is likely associated with increased dependence,[10,15] while the TPSAC report specifically highlights that the availability of menthol increases the likelihood of addiction among youth, but not adults.[1] Our review of the evidence is consistent with the FDA's conclusion that the weight of the evidence demonstrates greater levels of nicotine dependence among menthol compared to non-menthol smokers in both youth and adults.

- **Youth menthol smokers report greater levels of nicotine dependence than youth non-menthol smokers.**
  Of seven studies assessing nicotine dependence among youth,[23,25,26,38-41] five demonstrate significantly higher endorsement of dependence symptoms among menthol smokers compared to non-menthol smokers.[23,25,26,38,40] Of the three studies using NYTS data from the 2000, 2002, 2004, and 2006, two[23,40] report that young menthol cigarette users have a significantly shorter first time-to-cigarette after waking, which is a hallmark of nicotine dependence,[42] after adjusting for gender, race, grade, number of days smoked in the past 30 days and number of cigarettes smoked per day. These two studies also show greater endorsement of withdrawal symptoms among youth menthol smokers, particularly, craving,[23,40] and feeling irritable or restless after not smoking for a few hours;[23] these findings also adjusted for gender, race, grade, number of days smoked in the past 30 days and number of cigarettes smoked per day. This is consistent with the third NYTS paper that highlights higher than median scores on a nicotine dependence scale among youth menthol compared to non-menthol smokers, controlling for controlling for age, gender, race/ethnicity, and smoking behavior (i.e., length, frequency, and level of smoking).[25] A smaller cross-sectional study of adolescents recruited for a cessation treatment study by Collins and Moolchan also reported a greater proportion of adolescent menthol smokers smoking within five minutes of waking compared to non-menthol smokers.[38] Further, a national longitudinal study of U.S. adolescents reported that initiating smoking with menthol cigarettes was associated with higher nicotine dependence score, controlling for gender, age, race/ethnicity.[26] The remaining two studies showed no differences in adolescent nicotine dependence in menthol versus non menthol smokers using the Hooked on Nicotine Checklist.[39,41]

- **Adult menthol smokers report shorter time to first cigarette than nonmenthol smokers.**
  Three studies in adults also focus on nicotine dependence among menthol compared to non-menthol smokers by assessing time to first cigarette.[43-45] Two studies in women show that female menthol smokers have a significantly shorter time to first cigarette than non-menthol smokers.[43,45] A third study in a sample of current daily smokers from 1990-2001 reported a significantly shorter time to first cigarette among Black menthol users compared to non-menthol users, but this relationship was not present among White smokers.[44]

Of ten studies published over a fifteen-year period, eight show that menthol smokers report increased nicotine dependence compared to non-menthol smokers.[23,25,26,38,40,43-45] The data on dependence among youth menthol smokers are particularly strong, given that four[23,25,26,40] of the five studies showing an association control for a number of important confounders and one of these documents a temporal relationship between initiation with menthol cigarettes and the subsequent development of a higher level of nicotine dependence compared to initiation with a non-menthol cigarette.[26] All three of the studies in adults are cross-sectional and

demonstrate a shorter time-to-first cigarette among menthol smokers compared to non-menthol smokers, two in women[43,45] and one in Blacks,[44] both groups targeted by tobacco industry marketing.[46]

The findings on increased nicotine dependence among youth and adults are particularly important because they highlight a potential mechanism linking experimentation with cigarettes through progression to regular use, and subsequently, reduced cessation among menthol smokers. As a result, it is very likely that a ban on menthol in cigarettes would reduce nicotine dependence at the population level, thus having tremendous impacts on both initiation and cessation of cigarette use.

The Scientific Evidence on Menthol and Adult Smoking Cessation Demonstrates a Likelihood That a Ban on Menthol Will Result in Higher Rates of Smoking Cessation

The weight of the scientific evidence shows that adult menthol smokers are less likely than adult non-menthol smokers to successfully quit smoking despite increased quit intentions and quit attempts. While these results apply across most population groups, we note in particular, and consistent with Congress' explicit direction to TPSAC, that minority menthol smokers are notably less likely to successfully quit than minority non-menthol smokers.

In examining evidence on the relationship between menthol cigarette use and smoking cessation, we focused on studies that used cessation measures in addition to measures of quit attempts or intention to quit; as a result, there are several studies using intention to quit or quit attempts as the primary outcome that are not addressed in this section.[47-49] An assessment of our included studies is outlined in detail below.

- **Four studies in the Tobacco Use Supplement to the Current Population Survey (TUS-CPS)** measure cessation outcomes beyond quit attempts or intention to quit. Of these, three[50,51,52] demonstrate that menthol users are less successful in quitting than non-menthol users despite increased quit attempts or intentions to quit. The fourth study[53] found no difference between menthol and non-menthol smokers. For the reasons discussed below, the fourth study should be given less weight than the first three.

    - In a study of cessation by racial/ethnic groups by Trinidad et al.,[50] African American and Hispanic/Latino menthol smokers had significantly increased intention to quit and positive estimation of quit success compared to African American and Hispanic/Latino non-menthol smokers, controlling for age, gender, education, daily/non-daily smoking, smoking within 30 minutes of waking, current use of other tobacco products, and interest in quitting smoking. In contrast, cessation of at least six months was significantly reduced by 52% to 78% in African American, Hispanic/Latino, Asian American/Pacific Islander, and non-Hispanic white menthol smokers compared to non-menthol smokers controlling for age, education, gender and current use of other tobacco products; cessation was reduced, but not statistically significantly, among Native American/Alaska Native menthol smokers.

    - A second study of 65,510 adults by Levy et al.[51] found that past-year quit attempts were significantly increased in menthol compared to non-menthol smokers, but short-term (greater than 3 months and less than one year) and longer-term (greater than 3 months and less than five years) quit rates were significantly lower among those who smoke menthol cigarettes as compared to non-menthol cigarettes, controlling for demographics, state-level tobacco control policies, and nicotine dependence. The likelihood of quitting was about 3.5% lower for those quit in the last year and about 6% lower for those who quit within the last 5 years. This study also showed a significant decrease in longer-term cessation among African American menthol smokers and young adult (18-24) menthol smokers compared to non-menthol smokers.

    - A third study of white, black, and Hispanic ever smokers in the 2003 and 2006-07 TUS-CPS by Delnevo et al.[52] showed that menthol smokers were less likely to have quit smoking in the past five years compared to non-menthol smokers and that this relationship held among whites,

blacks, and Puerto Ricans when examining the broadest population of smokers – all former smokers and all current smokers regardless of quit attempt history. These findings were robust when examining more restrictive samples, including those who reported previous quit attempts and those who used cigarettes only and ranging in size from 24,465 (most restrictive sample) to 71,193 (broadest sample. All analyses controlled for gender, age, income, education, race/ethnicity, and year and month of the survey.

- The fourth study by Fagan et al.[53] examined quitting behaviors among daily menthol and non-menthol smokers with similar cigarette consumption patterns and found no difference in quit attempts or greater than two-week abstinence by menthol status, after controlling for demographic characteristics which were modeled differently for each level of consumption (i.e., 1-5 cigarettes per day, 6 – 10 cigarettes per day, 11 – 19 cigarettes per day, and 20+ cigarettes per day). Specifically, gender and race/ethnicity were not included in all models.

- The size and representative nature of the large, national TUS-CPS survey provides robust evidence for reduced cessation among adult menthol smokers in the United States. The first two TUS-CPS studies,[50,51] both of which demonstrated consistent, strong associations between menthol use and decreased long-term cessation, analyzed data from current and former smokers and consistently controlled for important confounders. They highlighted the discrepancy between quit attempts or intention to quit and quit success in menthol smokers. The third study,[52] consistently demonstrated decreased cessation among menthol smokers compared to non-menthol smokers overall and within whites, blacks, and Puerto Ricans across five population subsamples ranging from cessation-seeking current and former smokers to all current and former smokers. Similar to the other two studies,[50,51] this study controlled for important confounders in all multivariable analyses. The fourth study,[53] which did not show a difference in quitting behaviors by menthol status, used data from daily smoking adults which may be a more selected population than current and former smokers, did not consistently control for gender and race/ethnicity, and used a short-term cessation measure of two-week abstinence as compared to the longer and more reliable measures in the other three studies. For these reasons, the fourth study should be given less weight in the overall synthesis of the TUS-CPS data.

- **Studies of adult smokers in the 2005 National Health Interview Survey Cancer Control Supplement** corroborate the findings for reduced cessation among racial and ethnic subgroups from the TUS-CPS data. These studies report increased quit attempts in the past year among menthol compared to non-menthol smokers[54,55] but significantly reduced cessation among African-American[54,56] and Hispanic menthol smokers compared to non-menthol smokers.[56] One of these studies[56] also collapsed Hispanic and African-American smokers into one category and reported a statistically significant decrease of 45% in the odds of cessation among non-White menthol smokers compared to non-White non-menthol smokers. The single study assessing quit duration as a cessation measure showed that there was a significant increase in length of quit among white female menthol smokers compared to white female non-menthol smokers, but no statistically significant differences among the other five demographic groups.[55] Similar to the studies in the TUS-CPS, two of these three NHIS studies assessing cessation beyond quit attempts also controlled for demographic and smoking variables considered to be potential confounders in multivariable models and showed that African American menthol smokers had reduced cessation compared to White non-menthol smokers[54] and non-White menthol smokers had reduced cessation compared to non-White non-menthol smokers.[56] Results from these two studies add to the consistency of findings from nationally-representative surveys on reduced cessation among racial/ethnic subgroups of menthol smokers and further support the strength of the association between menthol use and reduced adult cessation.

- **Cohort studies and randomized controlled trials** exploring menthol's effect on smoking cessation also point to reduced cessation rates among menthol compared to non-menthol smokers.

- Of seven cohort studies examining differences in smoking cessation,[57-63] two reported significantly lower quit rates among menthol smokers compared to non-menthol smokers at follow-up.[60,61] The study by Pletcher et al.[60] showed a 37% reduction in the odds of sustained cessation adjusted for age, sex, and ethnicity, but this result did not retain statistical significance after additional adjustment for educational level, marital status, employment, and health insurance status. The other study by Gandhi et al.[61] reported significant reductions in the odds of cessation of 68% and 57% among African American and Latino menthol smokers, respectively, at 4-week follow-up and a decrease of 52% in African Americans at 6-month follow-up, controlling for age in years, education, gender, employment status, type of insurance, cigarettes per day, age smoked for first time, awaken at night to smoke, time to use first cigarette of day, previous attempts to quit smoking, and the presence of a disease caused or aggravated by smoking. Two additional studies by Reitzel et al. showed significant reductions in cessation in White menthol smokers, adjusted for covariates including age, partner status, income, and education; one for long-term (approximately 6 months) continuous abstinence in pregnant smokers[57] and one for short-term abstinence in adult daily smokers.[63] Three other studies did not show a difference in abstinence at follow-up in menthol compared to non-menthol smokers.[58,59,62] The COMMIT study,[59] which did not show a difference in cessation between menthol and non-menthol smokers, surveyed smokers in selected communities in the U.S. and Canada between 1988 and 1993. Possible reasons for the mixed results across the three studies include population sampling and recentness of the data. Of the four studies showing a statistically significant difference in cessation by menthol smoking status, one[61] was conducted in a cessation clinic population from 2001 to 2005, one[60] in a large cohort of healthy young African American and European American men and women in four US cities from 1985 through 2000, and two others in community-based samples in Houston, Texas between 2004 and 2008.[57,63] The two other studies showing no effect of menthol on cessation were conducted in southern States from 2002-2009[62] and in Minnesota between 2009 and 2011.[58] We would note that the cigarette market has undergone dramatic changes over the past 10-15 years, including the introduction of a number of new menthol brands. Because of the differences in menthol levels and effects among brands,[64] it is important to rely on the most recent data that reflects products currently on the market. Accordingly, we consider the COMMIT study less relevant to the question of adult cessation in the context of an FDA ban on menthol, as it includes older data. Additional weight should also be given to the cohort study conducted in a cessation clinic,[61] as it reflects smokers who are motivated to quit and thus, controls for confounding by cessation cognitions and intention to quit.

- Four randomized controlled trials[65-68] in populations motivated to quit smoking have also explored the impact of menthol cigarette use on cessation. One study testing the impact of a phone survey and provider progress notes on smoking cessation among VA patients showed no difference six months after the intervention in smokers who had not smoked in the past seven days.[65] However, three studies[66-68] testing the effect of pharmacotherapies and behavioral therapies on smoking cessation reported significantly reduced cessation among African American menthol smokers compared to African American non-menthol smokers. While results in two of these studies[66,67,69] maintained a consistent direction (i.e., menthol users had reduced cessation compared to non-menthol users), they were not statistically significant across all follow-up time points; one of these study reported significantly reduced cessation among menthol smokers at both time points assessed.[68] In the 2003 study by Okuyemi et al.,[66] African American menthol smokers had significantly reduced 7-day point prevalence abstinence at 6 weeks (28.3% vs. 41.5%; $p = 0.006$) compared to African American non-menthol smokers, but the difference was not significant at 6 months (21.4% vs. 27.0%; $p = 0.21$). In the 2007 study of African American light smokers (≤ 10 cigarettes per day) by Okuyemi et al.,[67] menthol smokers had significantly reduced 7-day point prevalence abstinence at 26 weeks (11.2% vs. 18.8%; $p = 0.015$) compared to non-menthol smokers, but not at 8 weeks (22.6% vs. 26.8%; $p = 0.291$). The 2013 study of African American light smokers by Faseru et al.[68] showed significantly reduced cotinine-verified 7-day point prevalence abstinence among menthol compared to non-menthol smokers at week 7

(14.4% vs. 28.4%; p = 0.001) and week 26 (10.0% vs. 20.4%; p = 0.005); this study also demonstrated an 84% increased odds of cessation among non-menthol compared to menthol smokers, controlling for treatment, visit attendance, cotinine level, and years smoked. One major difference in these studies is focus of the cessation intervention. The three studies[66-68] testing the impact of an individual-level intervention showed reduced cessation among menthol smoking participants while the provider-focused intervention[65] showed no difference in cessation among menthol and non-menthol smoking participants. The studies focusing on individual-level interventions are more relevant to the question of menthol's influence on smoking cessation, as they capture a seven to eight week window of evidence-based treatment for smoking cessation rather than a single provider visit. The three studies of African American smokers[66-68] provide particularly strong evidence of reduced cessation among menthol compared to non-menthol smokers in the face of extended smoking cessation treatment.

- Of the seven cohort studies and four randomized controlled trials (11 studies in all), seven are consistent in reporting reduced cessation at follow-up among menthol compared to non-menthol smokers.[57,60,61,63,66-68] Evidence from these seven studies with consistent results also support the temporal relationship between menthol smoking and reduced smoking cessation through their study designs which included longitudinal follow-up of adult smokers.

- **Community-based cross-sectional surveys** exploring menthol's effect on smoking cessation report mixed findings on reduced cessation success among menthol compared to non-menthol smokers.
  - One study from 1981-1999 in a hospital-based study of 19,545 current and former smokers showed that Black and White menthol users were significantly less likely to be former smokers compared to non-menthol users, but was no longer significant after controlling for age, sex, education, case–control status, years of smoking, and cigarettes per day.[70] Another study of 480 inner-city adult current smokers reported that menthol smokers reported a more recent quit attempt compared to non-menthol smokers (12 vs. 24 days; p = 0.047), but there was no difference in most recent or longest ever duration of abstinence.[71] A third study of 928 female smokers screened for a smoking cessation study reported that fewer menthol smokers reported a previous quit attempt of greater than 90 days compared to non-menthol smokers.[45] These studies suggest that menthol cigarette smokers have less success with longer-term smoking cessation compared to non-menthol smokers.

Three of four studies in the TUS-CPS[50-52] and two of three studies in the Cancer Control Supplement to the National Health Interview Survey[54,56] that examined quit attempts and additional cessation measures among adult smokers indicate that cessation is reduced in non-Hispanic whites and in racial and ethnic subgroups of menthol smokers compared to non-menthol smokers despite increased quit attempts. These findings demonstrate reasonable consistency and a coherent picture of quit behavior among menthol smokers: menthol smokers make more quit attempts than non-menthol smokers, yet have a more difficult time quitting successfully. Four[57,60,61,63] of seven cohort studies and three[66-68] of four randomized controlled trials contribute to the consistency of the findings and the strength of the association between menthol smoking and reduced cessation among adult smokers. In addition, these seven (of 11 total) studies also demonstrate that menthol smoking precedes reduced cessation, as they measure cessation success at follow-up. One community-based cross-sectional study also indicates that female menthol smokers have reduced cessation success.[45] Further, these findings are plausible in light of historic tobacco industry marketing of menthol cigarettes as medicinal, less harmful, or even a more healthful product than non-menthol cigarettes[72-75] and the resulting perceptions among menthol smokers that menthol cigarettes may be less risky than regular cigarettes.[76] The above-referenced population-based cross-sectional, cohort, and randomized controlled studies, which showed strong and consistent associations between menthol use and reduced smoking cessation, were high quality, and addressed bias and confounding through regression adjustment or randomization. While there is some inconsistency of findings across all studies, taken as a whole, these studies establish that the existence of an association between menthol smoking and reduced cessation is more likely than not under the classification scheme recommended by TPSAC.

The strength and consistency of the associations shown in these data persuasively suggest that the removal of menthol from cigarettes would more likely than not improve smoking cessation outcomes in adult smokers. As with youth initiation, it is not possible to approach the question experimentally to determine what proportion of current menthol smokers would be able to quit smoking successfully as a result of a ban. However, as explained in more detail below, due to the tremendous harms of smoking, even small reductions in adult smoking prevalence would have important population-level effects on smoking-related morbidity, mortality, and medical costs, as well as reductions in youth smoking prevalence via changes in the social environment.[77,78]

The Scientific Evidence Demonstrates that the Benefits of a Menthol Ban Far Outweigh the Risks

Risks and Benefits to Non-Smokers, Primarily Youth. A menthol ban poses *no risks at all* to non-smokers, most importantly to the young teen-agers to whom menthol is so attractive. There are only benefits. The great harms associated with smoking initiation among youth are well-established and widely accepted.[79,80] Multiple large-scale longitudinal studies have demonstrated the importance of quitting smoking early to avoid premature tobacco-related mortality.[81-84] It is no longer disputed that cigarette smoking causes cancer, heart disease, respiratory disease, low birth weight, sudden infant death syndrome, and other serious health effects. It is similarly beyond dispute that even modest reductions in tobacco initiation among youth would result in significant reductions in premature tobacco-related death on a population level.[85]

Risks and Benefits to Current Smokers. Addicted menthol smokers who choose to quit smoking in the face of a menthol ban may encounter temporary withdrawal symptoms that would be encountered by any addicted smoker who stops smoking. There is no scientific evidence, however, linking smoking cessation to any serious physical health risks. There is some evidence that smoking cessation can exacerbate certain mental health problems in smokers who suffer from such problems,[86] but there is no evidence that these risks are either large or widespread. We do not minimize the very real difficulties encountered by addicted smokers in successfully quitting. We are mindful of the research discussed above which demonstrates that menthol smokers have lower success rates than non-menthol smokers in quitting. However, the risks of withdrawal symptoms are manageable through well-established, evidence-based treatments. Of particular importance, these risks pale in comparison to the indisputable and very significant benefits of quitting. This is certainly true for the African-American and other minority menthol smokers who the evidence shows are particularly less likely to quit and whom the FDA is specifically instructed to take into account in connection with its consideration of a menthol ban. Even a modest increase in cessation rates following a menthol ban would result in significant benefits to the public health on a population basis. Of course, since what is at issue is a ban on menthol and not a ban on all cigarettes and other tobacco products, addicted smokers could choose to avoid withdrawal symptoms by switching to unflavored cigarettes, smokeless tobacco, or cigars.

In evaluating the risks of a menthol ban, we would note that Congress was principally concerned with the "sudden" or "precipitous" removal of menthol products from the market.[12] Accordingly, and consistent with broader principles of public health, we have consistently recommended that the FDA provide prior notice of a menthol ban. It should use the time period between the notice and the actual implementation of the ban to provide public education on the benefits and possible methods of quitting and also to support the availability of evidence-based cessation services and treatments.

Estimation of the impact of a menthol ban on smoking prevalence. Using data from the 2012 NSDUH,[87] we estimate that there are approximately 58 million past-month cigarette smokers in the United States. Of these, approximately 1.6 million are aged 12-17, 11 million are aged 18-25, 12 million are aged 26-34, 12 million are aged 35-49 and 21 million are aged 50 and older. Given the prevalence of past-month menthol smoking in 2008-2010 in these age groups, adjusted for misclassification of menthol status,[7] we estimate that there are 20 million past-month menthol smokers in the United States. As presented in Table 1 below, changes in smoking prevalence pursuant to a ban on menthol in cigarettes could have dramatic population-level effects. Even an exceedingly conservative estimate of a 0.1% reduction in smoking prevalence among menthol

smokers would mean approximately 1,000 fewer youth smokers, 5,000 fewer young adult smokers, and 14,000 fewer smokers over the age of 26 – a total of more than 20,000 smoking careers either shortened or entirely averted. With larger – but still modest –estimated effects of the ban on menthol smoking prevalence, the effect is magnified demonstrating tremendous public health benefit. Given that half of all lifetime smokers die prematurely from a smoking-attributable illness,[13] any one of these estimates will translate into thousands of premature deaths averted.

Table 1. Estimated effect of menthol ban on number of smokers (2012 NSDUH data)

		Reduction in past-month smoking prevalence (Number of past-month menthol smokers)					
	Percent menthol smokers[7]	**Baseline**	**0.10%**	**1%**	**5%**	**10%**	**15%**
Menthol ban							
Youth							
12-17	56.7%	933,207	(933)	(9,332)	(46,660)	(93,321)	(139,981)
Adults							
18-25	45.0%	4,956,385	(4,956)	(49,564)	(247,819)	(495,639)	(743,458)
26-34	34.7%	4,180,020	(4,180)	(41,800)	(209,001)	(418,002)	(627,003)
35-49	30.5%	3,741,751	(3,742)	(37,418)	(187,088)	(374,175)	(561,263)
50 and older	30.7%	6,338,708	(6,339)	(63,387)	(316,935)	(633,871)	(950,806)
Net reduction in number of smokers		-	(20,150)	(201,501)	(1,007,504)	(2,015,007)	(3,022,511)

Additional modeling by our group demonstrated that the projected impact of a ban on menthol in cigarettes would translate into a tremendous impact on smoking-attributable deaths averted over a 40-year period.[88] In this analysis, which assumed implementation of the ban in 2010, a conservative 10% change in smoking initiation and cessation would result in over 300,000 smoking-attributable deaths averted between 2010 and 2040 with nearly one-third of these deaths averted in the African American population.

ANSWERS TO QUESTIONS POSED IN THE ANPRM

We did not answer all the questions laid out in the ANPRM, but provided answers to the questions for which we had information or opinions here.

A. Tobacco Product Standards

FDA should issue a product standard prohibiting the use of menthol as a characterizing flavor in cigarettes and other tobacco products

Based on the evidence and for the reasons set out above, Legacy urges FDA to issue a tobacco product standard to eliminate menthol, mint, and similar flavors as a characterizing flavor in cigarettes.

This comment focuses on removing menthol as a characterizing flavor in cigarettes because that has been the focus of both the TPSAC and internal FDA reviews. However, we also support regulatory action

prohibiting the use of menthol and related characterizing flavors in non-cigarette tobacco products as well as the use of any flavor, whether characterizing or not, in cigarettes and other tobacco products that would encourage youth to initiate smoking or would contribute to delaying smokers from quitting tobacco. This highlights the importance of FDA issuing deeming regulation asserting jurisdiction over all tobacco products, including cigars, so that, in the face of a ban on menthol cigarettes, tobacco users would not just switch to mentholated cigars or other tobacco products, rather than quit tobacco all together.

The Tobacco Control Act does not define "characterizing flavor", so FDA will have to determine what level of menthol constitutes a "characterizing flavor." There are several sources available for FDA in determining this. For example, the TPSAC report based its findings on brand designation – not a specific level of menthol – Further, the tobacco industry uses levels to determine whether a product would be marketed as a menthol cigarette:

> …the Lorillard Tobacco Company identified menthol levels of around 1000 ppm (wt/wt) of cigarette tobacco or higher as providing a characterizing flavor (Lorillard 2010). R.J. Reynolds Tobacco Company "…typically characterizes a cigarette as a menthol cigarette when the cigarette's menthol level is 0.3 percent or greater" by weight.[1]

We know that at lower levels, menthol masks taste and harshness of tobacco,[89] and at higher levels can produce a cooling sensation. As such, we encourage FDA to determine what level of menthol should be considered a "characterizing flavor", and then determine what level of menthol, if any, should be allowed in cigarettes to protect public health.

FDA should tap into the vast information the industry has developed on this subject in determining an allowable level of menthol to protect public health. The TPSAC report contains some evidence regarding how the level of menthol in each brand is determined; however, some of that information is redacted from the public view. Other studies point to evidence of industry manipulation of menthol levels to increase sales among specific groups[89], and how menthol impacts how people smoke.[90] Thus, the industry clearly possesses information that could elucidate FDA on an appropriate level of menthol, if any, that would protect public health.

The product standard that prohibits menthol as a characterizing flavor should also apply to ingredients that behave in the same way or provide the same experience as menthol. The TPSAC report points out that menthol analogues do exist.[1] It would be unfortunate, to say the least, for FDA to go through the process of banning menthol, only to have industry introduce an analogue or substitute, undermining the public health benefits of a menthol ban. Thus, FDA must ensure that the product standard covers ingredients or constituents that provide the same experience as menthol – both in flavor and sensory response.

Similarly, FDA must ensure that any product standard regarding menthol as a characterizing flavor in cigarettes also takes marketing of cigarettes into account, and avoids creating loopholes for keeping what are now known as menthol cigarettes on the market. The standard we envision would remove products currently labeled as menthol from the market altogether – not just changing their label or the name of the product.

Implementing a Product Standard

FDA already has experience implementing and enforcing a product standard: banning of flavors other than menthol. While the other flavors were obviously a smaller market share, enforcement of a product standard that prohibits menthol should follow a similar process to the product standard that prohibits other flavors in cigarettes. However, unlike the ban on other flavors, we recommend a phased approach similar to that used for the removal of "light" and "low tar" labels from cigarette packaging. Further we encourage FDA to consider the following areas when implementing the standard:

Phased approach

Legacy agrees with Congress' concerns that it would be unwise to remove menthol cigarettes from the market "suddenly" or "precipitously." A phase-in of a menthol ban should be long enough to allow consumers,

manufacturers and retailers to prepare, but not so long that analogues are introduced or developed, or that the menthol users have time to get used to other products and diminish the public health benefit of a menthol ban. For the product standard removing other flavored cigarettes from the market, the law required almost immediate action. However, for other product standards, the law requires that FDA wait one year before implementing such a standard. We believe that this is a sufficient amount of time to implement a ban on menthol, and is similar to the phased approach used when implementing the "light" and "low tar" labeling requirement. In that case, manufacturers and retailers knew the change in labeling would be implemented one year from the date of enactment of the law. Then, FDA issued guidance to manufacturers that on that date, they must cease manufacturing for sale or distribution the products for which the label indicates "light" or "low tar". In addition, FDA gave manufacturers 30 days to clear their inventory of these products. Then, FDA gave retailers some time to sell the products and deplete their inventory of the products with the prohibited labels. [91] We believe that this is a reasonable approach to introducing a product standard for banning menthol.

This phased in approached should not be confused with a stepped approach. We emphatically oppose a product standard that requires gradual reduction in menthol levels over time. Such a stepped plan would likely not achieve as strong a public health benefit, as smokers would likely get used to each level of menthol and would be less likely to quit.

Comprehensive Approach

As with many tobacco control policies, a comprehensive approach to implementation is likely the best way to get the biggest public health impact. As stated in CDC's Best Practices for Comprehensive Tobacco Control Programs, "a comprehensive approach combines educational, clinical, regulatory, economic and social strategies."[92] It also "requires coordination and collaboration across the federal government, across the nation, and within each state."[92] Implementation of a product standard regarding menthol should be no different. In the year between the issuance of the final rule banning menthol, and the implementation of the rule, FDA must prepare itself, the industry and the public by providing the following::

- Cessation Services FDA/HHS should ensure cessation services are available and actively promoted. As we stated in the evidence synthesis above, the weight of the scientific evidence shows that adult menthol smokers are less likely than adult non-menthol smokers to successfully quit smoking despite increased quit intentions and quit attempts. Therefore, it is all the more important to ensure that those who want to quit as a menthol ban in implemented have access to the services and tools they need to quit. We suggest that in addition to issuing the product standard, FDA implement the following:

    - running a smoking cessation public education campaign designed to reach menthol smokers, specifically including the millions of racial and ethnic minority menthol smokers and help motivate them to quit rather than simply switch to using non-mentholated tobacco products;
    - increasing availability of culturally-relevant cessation services;
    - providing community-based and other targeted outreach to ensure underserved populations are receiving campaign messages and cessation services

  The public health benefits of a menthol ban will not be fully realized if cessation services are not provided and promoted.

- Public Education campaign – The effectiveness of tobacco counter marketing is well established.[93] In the case of a product standard to ban menthol, FDA must not only provide cessation services, but must make sure that consumers are aware of the change that is coming, and ensure that those who want and need cessation services know they are available. Part of the success of a product standard banning menthol is encouraging as many menthol smokers to quit, rather than switch to regular cigarettes. Additionally, it will be important to prevent people from initiating smoking as well. To

that end, we understand FDA is producing a youth prevention public education campaign that will focus on menthol.[94] That is an important aspect but it cannot be the only public education that takes place. It will be important to explain why this product standard would be an opportunity for current menthol smokers to quit smoking altogether.

- Surveillance and Enforcement - Once FDA takes action in implementing a product standard to ban menthol, it will need to improve its enforcement mechanisms. There are several mechanisms already in place to enforce the ban on other flavors of cigarettes. FDA has employed online and brick and mortar surveillance to ensure enforcement, as well as engaging with the larger tobacco control community to report violations. These systems must be developed to support the larger scale that a ban on menthol would entail. We discuss enforcement in more detail later in this comment.

B. Sales and Distribution Restrictions

We do not believe that marketing/advertising or sales/distribution restrictions on menthol cigarettes would be adequate to protect public health. While those measures can be effective in other areas, and are an important part of comprehensive tobacco control efforts, it is Legacy's position that the only way to protect the public health from the effects of menthol is to prohibit it as a characterizing flavor.

C. Other Actions and Considerations

Compliance and Enforcement

Legacy believes that FDA has effectively enforced the product standard banning flavored cigarettes from entering the market, using the traditional warning letters system, the retailer compliance grants, and other tools at its disposal. We understand, based simply on relative market share that the implementation of a menthol ban would be more complicated. However, the same tools would be applicable. This will require FDA to use its full authority to impose penalties for smuggling, as well as its record-keeping requirements to help encourage manufacturer complicity with any product standard banning menthol, and boost its capabilities for surveillance and enforcement at the retail level, including monitoring internet sales, conducting compliance checks, and issuing warning letters and Civil Money Penalties for violations.

Earlier this year, Legacy signed onto a citizen petition urging FDA to establish a track and trace system to follow tobacco products from the manufacturer through the supply chain to the retailer.[95] We reiterate that call for FDA to establish such a system here and we incorporate by reference that petition into this comment. Such a system is required by the Tobacco Control Act[96] and would go a long way toward discouraging a black market of products that do not meet FDA tobacco product standards, such as the product standard banning menthol contemplated here.

Such a system would also help consumers, retailers and law enforcement identify those illicit products that are out of compliance with FDA product standards. As the citizen petition supporting a track and trace system for tobacco products stated:

> Traceability would ensure that manufacturers met new product standards in a timely fashion, or would provide a mechanism for accountability if they did not. Non-compliant products without identifying codes would be made easily identifiable to distributors, retailers, and consumers. It would help retailers to spot illicit products and to minimize their risk, and financial and administrative burden… Enforcement of the protections against adulterated tobacco products under Section 902 would be enhanced by a track and trace system that could identify the point in the distribution chain at which the product became adulterated.[95]

Black Market

Tobacco industry opponents of a menthol ban vigorously argue that a ban will result in a black market of unregulated and possibly counterfeit menthol cigarettes. They suggest that these cigarettes will be more dangerous than cigarettes currently on the market. Few scientific studies have been conducted on this topic, but several studies have shown that the tobacco companies themselves are largely responsible for the facilitation of these illegal activities.[97-101] Furthermore, a recent study counters these industry arguments, showing that tobacco industry exaggerates the scope of illicit trade.[102] Researchers at the American Cancer Society conducted a study in 2011 and found that the proportions of illicit cigarette packs in Poland did not differ across data collection methods when comparing survey data (14.6%) to discarded pack data (15.6%), but tobacco industry estimates of illicit packs were nearly 50% higher (22.9%).

We believe the potential for a black market in menthol cigarettes is similarly overstated by the tobacco industry. First, while the U.S. does have an illicit trade market in cigarettes that is of great concern, compared to other countries, the U.S. has a smaller illicit trade market in cigarettes – with less than 10% of our total cigarette market in 2011.[103] Similarly, while it was a very small portion of the market, there have been no reports on a black market of flavored cigarettes following the FDA's 2009 ban on flavored cigarettes Second, most black market cigarettes in the U.S. are avoiding higher taxes in one state – they are purchased in lower-tax states and brought to higher-tax states.[104] The Compass Lexecon report submitted to TPSAC on behalf of the Lorillard Tobacco Company focused on the illicit trade to avoid or evade taxes.

The incentive for interstate traffic to evade higher state taxers would not apply in the event of a menthol ban which would be nationwide. As aforementioned citizen petition urging FDA to ban menthol as a characterizing flavor states:

> It would be very difficult to build a significant market for menthol cigarettes without advertising, marketing and packaging them as such. However, to do so would only advertise the illicit nature of the product. Thus, the potential for the development of a significant black market for menthol cigarettes is limited.[3]

We would also note the following points:

First, in evaluating claims regarding relative harms of legal and contraband cigarettes, legally-available menthol cigarettes, like all cigarettes, are already exceedingly dangerous, killing roughly half of lifelong users. The mere fact that contraband cigarettes would be very dangerous—which is undoubtedly true—simply reflects the essential nature of this lethal product.

Second, with regard to the extent of a potential black market, while a menthol ban may lead to some level of illegal sales, the vast majority of menthol smokers are likely to comply with the law. As has been observed in other contexts, the use of illegal drugs carries a high cost for the user, including fear of apprehension, punishment, and cost in time and worry in acquiring an illegal substance.[105] In addition, it is important to keep in mind that what is under consideration is a ban on menthol products – not a ban on all cigarettes. Menthol smokers who are not able to, or choose not to, quit will still have full legal access to unflavored cigarettes and other tobacco products.

Third, the PACT Act provides strong disincentives to the illegal smuggling of tobacco products, which will also help deter those tempted to buy or sell menthols illegally.[106] The FDA should accompany a menthol ban with additional enforcement measures, including stiff penalties for smugglers and stringent record-keeping requirements for manufacturers and importers, to prevent a significant black market from developing. Other federal agencies considering limiting or banning particular products or substances have determined that similar measures made a significant black market unlikely.[107] For example, in announcing its intent to impose limits on the use of the pesticide methyl bromide, the EPA noted that the existing controls on the shipment, sale, and use of the pesticides, as well as stringent penalties for violating Clean Air Act record-keeping requirements, made the development of a black market for the substance unlikely.[108] In another context, the Department of Agriculture considered a number of factors in concluding that the imposition of a tariff was

unlikely to give rise to a black market for avocadoes, including the fact that "persons involved in such illegal transshipment are liable to legal action, incarceration, or fines."[109]

Finally, the very cigarette companies that raise the specter of a large black market will play a significant role in determining whether or not such a black market arises. Studies on cigarette smuggling in other countries indicate the strong role of the tobacco industry itself in the facilitation of these illegal activities.[97-101] In fact, several studies highlight a detailed strategy by British American Tobacco to smuggle cigarettes into various countries in the Middle East,[110] Africa[111] and Asia,[112] including China,[113,114] and to set up strategic locations to support smuggling, such as Cambodia.[115] In North America, cigarette tax increases between 1980-1994 in Canada were countered by significant smuggling from the United States into Canada through a few U.S. Native American reservations.[116] While the tobacco industry blamed rampant smuggling on cigarette taxation, research shows that the industry actually promoted smuggling schemes, resulting in U.S. and Canadian criminal convictions of tobacco industry officials and partners.[116] In the current U.S. market, the fact that the top menthol brand is exclusively manufactured in the United States strongly suggests that its manufacturer, Lorillard Tobacco Company, could exercise a great deal of control over any smuggling of its legitimate products and should partner with the FDA in efforts to combat a possible black market.

Marketing

In the Advanced Notice of Proposed Rulemaking, FDA asked for data related to marketing. The following presents an overview of empirical studies on targeted marketing of menthol cigarettes and highlights studies showing current advertising and/or promotion of menthol cigarettes targeted to specific communities.

As noted in the TPSAC and FDA reports, the evidence supports that the marketing of menthol cigarettes is likely associated with brand preference particularly among adolescents and African Americans.

- **Young smokers remain an important target for menthol marketing, despite advertising restrictions.**

  Tobacco industry document reviews have shown that menthol cigarettes have been marketed to young people[34,46] and marketing research from 1992 confirmed that the perceived age of models in menthol cigarette advertisements (mean age = 25.7 years) was lower than in advertisements for non-menthol brands (mean age = 31.9 years).[117] Research on point-of-sale marketing efforts[118,119] and current research on print advertising, conducted by our group in 2012-2013,[120] supports these findings. A Minnesota study that collected data in 2007 showed that for every 10% increase in the percentage of youth (under the age of 18) in a census block group, there was a 12% increase in the total number of menthol advertisements.[118] Similarly, data collected in 2006 in California showed that for every 10% increase in the proportion of neighborhood residents aged 10-17 years, there was an 11.6 percentage point increase in the share of menthol cigarette advertising and the odds of a Newport promotion were 5.3 times greater.[119] The latter study also showed that this effect was specific to marketing of Newport cigarettes; Marlboro advertising – menthol or non-menthol – was unrelated to any school neighborhood demographics. *In comprehensive advertising surveillance over a nine-month period (June 2012 – February 2013), 32 unique print ads for menthol cigarettes were identified: 28 ads for Newport cigarettes and 4 ads for American Spirit cigarettes. Both were shown to advertise in publications targeted to young adults, aged 18-24, including Maxim, Elle, ESPN magazine, and InTouch Weekly. In addition, Newport advertisements featured themes of sociability and sexuality and people mainly in groups of mixed race/ethnicity and estimated by coders to be in their 20s and 30s. American Spirit advertisements focused on messages of harm reduction and individuality, known to appeal to young smokers.* Tobacco industry document reviews, as well as empirical studies and current surveillance of tobacco advertising show that menthol cigarettes are

still targeted to young smokers at the point-of-sale and in print, despite restrictions placed on youth marketing in the Master Settlement Agreement.

- **Brand preference for menthol cigarettes has significantly increased among youth over time and especially among the youngest smokers (aged 13-14).** One study comparing three national surveys (The Robert Wood Johnson Foundation 1996 National Survey of Tobacco Price Sensitivity, Behavior, and Attitudes Among Teenagers and Young Adults and the TAPS-I and II surveys from 1989 and 1993) showed that brand preference for Newport, the most popular menthol brand among youth, increased significantly from 8.3% in 1989 to 12.5% in 1993 and 16.4% in 1996 ($p < 0.01$) in adolescent smokers aged 13 to 18.[121] This study also reported that the percent of youth reporting usually buying Newport increased dramatically among the youngest smokers from 1989 to 1996: Over that time period there was a 347% increase among 13- to 14-year olds; a 189% increase among 15-year-olds; and a 69% increase among 16- to 18-year-olds. By way of comparison, youth preference for Marlboro and Camel cigarettes, the other two most popular brands among youth, remained unchanged across this time period. This study used large national samples of adolescents with approximately 9,000 respondents in 1989, 13,000 in 1993, and 17,000 in 1996 to demonstrate a statistically significant increase in youth menthol brand preference over a seven-year period. Further, the magnitude of the increase in brand preference for Newport cigarettes was most striking among the youngest smokers.

- **Newer menthol brands are gaining popularity among young smokers.** In line with a tobacco industry document review and laboratory testing showing that menthol levels in Camel and Marlboro menthol products were engineered to attract younger smokers between 2000 and 2007,[36] our recent study by Giovino et al. demonstrated that preference for Camel menthol and Marlboro menthol cigarettes increased significantly among adolescents (aged 12-17) and young adults (aged 18-25) from 2004-2006 to 2008-2010.[7] This study also reported that during 2008–2010, 1.0 million adolescents and 4.6 million young adults used Camel menthol, Marlboro menthol, or Newport menthol cigarettes.

- **Heavily marketed menthol brands influence menthol cigarette use in young smokers.** Two studies in adolescents link menthol promotion and brand recognition with use of particular brands. One study of point-of-sale advertising in Hawaiian stores conducted in 2002 showed that Kool menthol cigarettes were the most heavily advertised brand and the brand most smoked by middle school youth in Hawaii.[122] Another study conducted in 2006 and 2007 in California reported that African American youth were more likely to recognize Newport cigarettes and at one-year of follow-up, recognition of Newport predicted experimentation with cigarettes, even after adjusting for known risk factors.[27]

- **African Americans are disproportionately exposed to menthol cigarette marketing.** Studies of print advertising in the 1980's, 1990's and 2000's showed that menthol cigarette advertisements were more prevalent in magazines targeted to Black readers[123,124] and Latino readers[123] compared to white readers. Current data collected provide similar findings. *Comprehensive advertising surveillance conducted by our group in 2012-2013 showed that print advertisements for Newport cigarettes were placed in the same publications noted in Cummings et*

al.'s 1987 study - Jet, Ebony, and Essence – with significant readership among African American women, and that 61% of the 28 Newport ads collected during this nine-month period featured at least one African American model.[120] Furthermore, 70% of the money spent on primary menthol advertisements collected during this period was delivered via direct mail advertising, with the majority of direct mail or e-mail menthol cigarette ads featuring a coupon for the product advertised. The promotion of menthol cigarettes through tobacco coupons is of particular concern given a 2006 study showing that African Americans who smoked menthol brands were more likely to use promotional offers than African American smokers of other brands.[125] Concerns about price promotions and the African American community have also been noted in military exchanges, given the high representation of African Americans in the U.S. military enlisted ranks.[126] A 2012 study of 48 matched pairs of military exchanges and Walmart stores distributed across all four branches of the military (i.e., Air Force, Army, Navy, Marine Corps) reported that the price of Newport menthol cigarettes at military exchanges were 23% lower than the price at the nearest Walmart in 2011.[126] This is in violation of Department of Defense Instruction 1330.9, implemented in 2001, that specifies that tobacco products sold in military exchanges be "no lower than five percent below the most competitive commercial prices in the local community."[127] These studies demonstrate the disproportionate targeting of menthol cigarette marketing, including print and direct mail advertising, price promotions, and price discounts, to African Americans within the past five years.

- **African American communities are disproportionately exposed to menthol cigarette marketing.** In a tobacco industry document review, Yerger, Przewoznik and Malone demonstrate the industry's strategic selection of inner cities, populated by low-income African Americans, in which to concentrate menthol cigarette marketing.[128] Though these practices started as early as the 1970's, recent evidence confirms that the strategy remains intact with two studies conducted in the past eight years[118,119] and two studies conducted in the past five years[129,130] documenting greater menthol advertising at the point-of-sale in African American communities. A study by Henriksen et al. conducted in 2006 among neighborhoods within a half-mile of California high schools found that with every 10% increase in the proportion of African-Americans in the neighborhood, menthol cigarette advertising increased by 5.9%, Newport promotions were 50% higher, and the cost of Newport was 12 cents lower.[119] In contrast, this study showed no association between school/neighborhood demographics and Marlboro price or promotions. A study conducted by Widome et al. in 2007 in Minnesota reported a 26% increase in menthol cigarette advertising at the point of sale per 10% increase in the proportion of African Americans in the census block group.[118] After adjusting for proportion of the block group living below the 150% poverty level, each 10% increase in the proportion of African Americans in the block group was associated with a 20% increase in menthol advertisements at the point-of-sale. The two current studies, with data collected in the past five years, show similar patterns. Seidenberg et al. collected data from 2007-2008 on storefront advertising in two Boston communities: one primarily minority, low income community (Dorchester, MA) and one predominantly white, high income community (Brookline, MA).[129] This study found that Dorchester had a significantly higher proportion of menthol brand advertising at the point-of-sale compared to Brookline and that multivariable analyses showed a nearly five-fold increase in the odds of a menthol brand advertisement being found in Dorchester compared to Brookline. *Researchers in our group conducted intensive point-of-sale surveillance of all Washington, D.C. retail outlets with tobacco licenses from 2010-2011 and compared exterior ads and displayed price for Lorillard cigarettes with census block group demographics.[130] 92% of tobacco*

outlets in DC sold Newport cigarettes and controlling for neighborhood and store characteristics, the adjusted odds ratio of selling Newport cigarettes increased by 11% for every 10% increase in African American residents in the census block (p<0.01). Additionally, 29% of outlets had exterior cigarette advertising featuring prices, 90% of which were Lorillard brands and 59% for Newport cigarettes. Controlling for neighborhood and store characteristics, the incidence rate ratio for the number of exterior Newport or Maverick menthol ads increased by 13% for every 10% increase in the percentage of African Americans in the census block group (p<0.001). The average price displayed for Newport cigarettes was $0.80 lower than non-displayed price ($7.48 vs. $8.28; p<0.001) and for every 10% increase in the proportion of African Americans in the census block group, there was a decrease of $0.06-$0.07 in Newport display price, controlling for neighborhood and store characteristics (p<0.001). The likelihood that Lorillard was the brand with the lowest exterior displayed price increased by 22% for every 10% increase in the proportion of African Americans in the census block group, controlling for neighborhood and store characteristics (p=0.02). This is the only comprehensive surveillance study of the local point-of-sale environment and it shows the increased presence of Lorillard brands, particularly Newport, in inner city African American communities. These studies highlight the continued targeted marketing of menthol cigarettes at the point-of-sale in African American communities throughout the U.S. – in California, Massachusetts, Minnesota, and Washington, D.C.

CONCLUSION

For all the reasons set forth above, a review of the scientific evidence demonstrates that there is more than sufficient evidence to establish the requisite relationship between menthol cigarettes and (1) increased youth smoking initiation, (2) increased nicotine dependence, and (3) decreased adult cessation. In addition, current advertising data, collected within the past five years, shows the continued targeted marketing of menthol cigarettes to young smokers and African Americans.

A menthol ban is more likely than not to result in decreased youth initiation and increased adult cessation. Moreover, the likely benefits of a menthol ban of decreased youth initiation and increased adult cessation will substantially outweigh the risks of such a ban. These risks, which only affect addicted smokers, are manageable by providing adequate advance notice of a ban and assuring the provision of cessation services and treatments. There are no risks at all of a menthol ban to non-smokers, most importantly, youth. Finally, there is, at most, scant scientific evidence to support the concerns which have been raised regarding the creation of a black market and dangers caused by counterfeit or contraband menthol cigarettes. We have presented other evidence that supports the view that the problems will not be nearly as severe as the tobacco industry suggests and indeed, that the industry itself may promote the black market. To the extent these problems may arise, they are properly managed through law enforcement tools and tobacco industry cooperation.

We appreciate your consideration of these comments. If you have any questions, please contact Diane Canova, Vice President of Government Affairs at 202-454-5559 or dcanova@legacyforhealth.org.

Sincerely,

M. David Dobbins
Chief Operating Officer

LEGACY
FOR LONGER HEALTHIER LIVES

REFERENCES

1. Tobacco Products Scientific Advisory Committee. *Menthol Cigarettes and Public Health: Review of the Scientific Evidence and Recommendations.* Rockville, MD: Center for Tobacco Products, Food and Drug Administration;2011.
2. "FDA Advance Notice of Proposed Rulemaking; Menthol in Cigarettes, Tobacco Products; Request for Comments," 78 *Federal Register* (24 July 2013), pp. 44484-44485.
3. Tobacco Control Legal Consortium et al. *Citizen Petition to Food & Drug Admininistration, Prohibiting Menthol as a Characterizing Flavor in Cigarettes.* April 12, 2013.
4. True W. *Characterization of Menthol*. Paper presented at: PowerPoint slides presented at the meeting of the Tobacco Products Scientific Advisory Committee, July 2010; Gaithersburg, MD.
5. Ogden M. *Characterization of Menthol: History and Design of Menthol Cigarettes*. Paper presented at: PowerPoint slides presented at the meeting of the Tobacco Products Scientific Advisory Committee, July 2010; Gaithersburg, MD.
6. FTC. Federal Trade Commission Cigarette Report for 2011. Issued 2013.
7. Giovino GA, Villanti AC, Mowery PD, et al. Differential trends in cigarette smoking in the USA: is menthol slowing progress? *Tob Control.* Aug 30 2013.
8. Food, Drug and Cosmetic Act as amended by the Family Smoking Prevention and Tobacco Control Act, Section 907(a)(1)(A).
9. Food, Drug and Cosmetic Act as amended by the Family Smoking Prevention and Tobacco Control Act, Section 907(e)(1) and (2).
10. U.S. Food and Drug Administration. *Preliminary Scientific Evaluation of the Possible Public Health Effects of Menthol versus Nonmenthol Cigarettes.* Silver Spring, MD: Center for Tobacco Products, Food and Drug Administration;2013.
11. Food, Drug and Cosmetic Act as amended by the Family Smoking Prevention and Tobacco Control Act, §907(a)(3)(B)(i).
12. Committee on Energy and Commerce of the House of Representatives. *Report on the Family Smoking Prevention and Tobacco Control Act. Report 111-58.* Washington, D.C.: House of Representatives; 26 Mar 2009.
13. U.S. Department of Health and Human Services. *The health consequences of smoking: a report of the Surgeon General.* Washington, D.C.: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;2004.
14. National Cancer Institute. Bibliography of LIterature on Menthol and Tobacco. 2009; http://cancercontrol.cancer.gov/brp/TCRB/documents/menthol_bibliography_508.pdf. Accessed Oct 22, 2013.
15. U.S. Food and Drug Administration. *Reference Addendum: Preliminary Scientific Evaluation of the Possible Public Health Effects of Menthol versus Nonmenthol Cigarettes.* Silver Spring, MD: Center for Tobacco Products, Food and Drug Administration;2013.
16. *See, e.g., United States v. Article of Drug… Bacto-Unidisk*, 394 U.S. 784, 798 (1969) (The Food, Drug & Cosmetic Act is "to be give a liberal construction consistent with [its] overriding purpose to protect the public health.").
17. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *The NSDUH Report: Use of Menthol Cigarettes.* Rockville, MD2009.
18. Caraballo RS, Asman K. Epidemiology of menthol cigarette use in the United States. *Tob Induc Dis.* 2011;9 Suppl 1:S1.
19. Rock VJ, Davis SP, Thorne SL, Asman KJ, Caraballo RS. Menthol cigarette use among racial and ethnic groups in the United States, 2004-2008. *Nicotine Tob Res.* Dec 2010;12 Suppl 2:S117-124.
20. Farrelly MC, Faulkner DL, Mowery P. *Legacy First Look Report 1. Cigarette Smoking Among Youth: Results from the 1999 National Youth Tobacco Survey.* Washington, DC: American Legacy Foundation;2000.
21. Farrelly MC, Vilsaint M-C, Lindsey D, Kristin Y., Messeri P. *Legacy First Look Report 7. Cigarettte Smoking Among Youth: Results from the 2000 National Youth Tobacco Survey.* Washington, DC: American Legacy Foundation;2001.

22. Vilsaint M-C, Green M, Xiao J, et al. *Legacy First Look Report 13. Cigarette Smoking among Youth: Results from the 2002 National Youth Tobacco Survey.* Washington, DC: American Legacy Foundation;2004.

23. Hersey JC, Nonnemaker JM, Homsi G. Menthol cigarettes contribute to the appeal and addiction potential of smoking for youth. *Nicotine Tob Res.* Dec 2010;12 Suppl 2:S136-146.

24. Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. *The NSDUH Report: Recent Trends in Menthol Cigarette Use.* Rockville, MDNovember 18, 2011.

25. Hersey JC, Ng SW, Nonnemaker JM, et al. Are menthol cigarettes a starter product for youth? *Nicotine Tob Res.* Jun 2006;8(3):403-413.

26. Nonnemaker J, Hersey J, Homsi G, Busey A, Allen J, Vallone D. Initiation with menthol cigarettes and youth smoking uptake. *Addiction.* Jan 2013;108(1):171-178.

27. Dauphinee AL, Doxey JR, Schleicher NC, Fortmann SP, Henriksen L. Racial differences in cigarette brand recognition and impact on youth smoking. *BMC Public Health.* 2013;13:170.

28. Villanti AC, Giovino GA, Barker DC, Mowery PD, Sevilimedu V, Abrams DB. Menthol brand switching among adolescents and young adults in the National Youth Smoking Cessation Survey. *Am J Public Health.* Jul 2012;102(7):1310-1312.

29. Allen B, Jr., Cruz TB, Leonard E, Unger JB. Development and validation of a scale to assess attitudes and beliefs about menthol cigarettes among african american smokers. *Eval Health Prof.* Dec 2010;33(4):414-436.

30. Tauras JA, Levy D, Chaloupka FJ, et al. Menthol and non-menthol smoking: the impact of prices and smoke-free air laws. *Addiction.* Dec 2010;105 Suppl 1:115-123.

31. Foulds J, Hooper MW, Pletcher MJ, Okuyemi KS. Do smokers of menthol cigarettes find it harder to quit smoking? *Nicotine Tob Res.* Dec 2010;12 Suppl 2:S102-109.

32. Cantrell DV. KOOL isn't getting the starters. Brown & Williamson Tobacco Corporation. Bates No. 621079918-9921. 1987, February 17; http://legacy.library.ucsf.edu/tid/gas01f00. Accessed August 19, 2011.

33. Achey TL. Product Information, Lorillard. 1978, August 30(Bates No. 94671153/1154). http://legacy.library.ucsf.edu/tid/nlt13c00. Accessed July 27, 2010.

34. Klausner K. Menthol cigarettes and smoking initiation: a tobacco industry perspective. *Tob Control.* May 2011;20 Suppl 2:ii12-19.

35. Yerger VB. Menthol's potential effects on nicotine dependence: a tobacco industry perspective. *Tob Control.* May 2011;20 Suppl 2:ii29-36.

36. Kreslake JM, Wayne GF, Alpert HR, Koh HK, Connolly GN. Tobacco industry control of menthol in cigarettes and targeting of adolescents and young adults. *Am J Public Health.* Sep 2008;98(9):1685-1692.

37. Adelman D, Grainger M, Ayala V, Paxton K. *Menthol regulatory refresh; activity likely to increase.* New York, NY: Morgan Stanley & Co. LLC;2012.

38. Collins CC, Moolchan ET. Shorter time to first cigarette of the day in menthol adolescent cigarette smokers. *Addict Behav.* Aug 2006;31(8):1460-1464.

39. DiFranza JR, Savageau JA, Fletcher K, et al. Recollections and repercussions of the first inhaled cigarette. *Addict Behav.* Feb 2004;29(2):261-272.

40. Wackowski O, Delnevo CD. Menthol cigarettes and indicators of tobacco dependence among adolescents. *Addict Behav.* Sep 2007;32(9):1964-1969.

41. Li J, Paynter J, Arroll B. A cross-sectional study of menthol cigarette preference by 14- to 15-year-old smokers in New Zealand. *Nicotine Tob Res.* Jul 2012;14(7):857-863.

42. Baker TB, Piper ME, McCarthy DE, et al. Time to first cigarette in the morning as an index of ability to quit smoking: implications for nicotine dependence. *Nicotine Tob Res.* Nov 2007;9 Suppl 4:S555-570.

43. Ahijevych K, Parsley LA. Smoke constituent exposure and stage of change in black and white women cigarette smokers. *Addict Behav.* Jan-Feb 1999;24(1):115-120.

44. Muscat JE, Liu HP, Stellman SD, Richie JP, Jr. Menthol smoking in relation to time to first cigarette and cotinine: results from a community-based study. *Regul Toxicol Pharmacol.* Jun 2012;63(1):166-170.

45. Rosenbloom J, Rees VW, Reid K, Wong J, Kinnunen T. A cross-sectional study on tobacco use and dependence among women: Does menthol matter? *Tob Induc Dis.* 2012;10(1):19.
46. Anderson SJ. Marketing of menthol cigarettes and consumer perceptions: a review of tobacco industry documents. *Tob Control.* May 2011;20 Suppl 2:ii20-28.
47. Alexander LA, Crawford T, Mendiondo MS. Occupational status, work-site cessation programs and policies and menthol smoking on quitting behaviors of US smokers. *Addiction.* Dec 2010;105 Suppl 1:95-104.
48. Fagan P, Augustson E, Backinger CL, et al. Quit attempts and intention to quit cigarette smoking among young adults in the United States. *Am J Public Health.* Aug 2007;97(8):1412-1420.
49. Kahende JW, Malarcher AM, Teplinskaya A, Asman KJ. Quit attempt correlates among smokers by race/ethnicity. *Int J Environ Res Public Health.* Oct 2011;8(10):3871-3888.
50. Trinidad DR, Perez-Stable EJ, Messer K, White MM, Pierce JP. Menthol cigarettes and smoking cessation among racial/ethnic groups in the United States. *Addiction.* Dec 2010;105 Suppl 1:84-94.
51. Levy DT, Blackman K, Tauras J, et al. Quit attempts and quit rates among menthol and nonmenthol smokers in the United States. *Am J Public Health.* Jul 2011;101(7):1241-1247.
52. Delnevo CD, Gundersen DA, Hrywna M, Echeverria SE, Steinberg MB. Smoking-cessation prevalence among U.S. smokers of menthol versus non-menthol cigarettes. *Am J Prev Med.* Oct 2011;41(4):357-365.
53. Fagan P, Moolchan ET, Hart A, Jr., et al. Nicotine dependence and quitting behaviors among menthol and non-menthol smokers with similar consumptive patterns. *Addiction.* Dec 2010;105 Suppl 1:55-74.
54. Stahre M, Okuyemi KS, Joseph AM, Fu SS. Racial/ethnic differences in menthol cigarette smoking, population quit ratios and utilization of evidence-based tobacco cessation treatments. *Addiction.* Dec 2010;105 Suppl 1:75-83.
55. Cubbin C, Soobader MJ, LeClere FB. The intersection of gender and race/ethnicity in smoking behaviors among menthol and non-menthol smokers in the United States. *Addiction.* Dec 2010;105 Suppl 1:32-38.
56. Gundersen DA, Delnevo CD, Wackowski O. Exploring the relationship between race/ethnicity, menthol smoking, and cessation, in a nationally representative sample of adults. *Prev Med.* Dec 2009;49(6):553-557.
57. Reitzel LR, Nguyen N, Cao Y, et al. Race/ethnicity moderates the effect of prepartum menthol cigarette use on postpartum smoking abstinence. *Nicotine Tob Res.* Dec 2011;13(12):1305-1310.
58. D'Silva J, Boyle RG, Lien R, Rode P, Okuyemi KS. Cessation outcomes among treatment-seeking menthol and nonmenthol smokers. *Am J Prev Med.* Nov 2012;43(5 Suppl 3):S242-248.
59. Hyland A, Garten S, Giovino GA, Cummings KM. Mentholated cigarettes and smoking cessation: findings from COMMIT. Community Intervention Trial for Smoking Cessation. *Tob Control.* Jun 2002;11(2):135-139.
60. Pletcher MJ, Hulley BJ, Houston T, Kiefe CI, Benowitz N, Sidney S. Menthol cigarettes, smoking cessation, atherosclerosis, and pulmonary function: the Coronary Artery Risk Development in Young Adults (CARDIA) Study. *Arch Intern Med.* Sep 25 2006;166(17):1915-1922.
61. Gandhi KK, Foulds J, Steinberg MB, Lu SE, Williams JM. Lower quit rates among African American and Latino menthol cigarette smokers at a tobacco treatment clinic. *Int J Clin Pract.* Mar 2009;63(3):360-367.
62. Blot WJ, Cohen SS, Aldrich M, McLaughlin JK, Hargreaves MK, Signorello LB. Lung cancer risk among smokers of menthol cigarettes. *J Natl Cancer Inst.* May 18 2011;103(10):810-816.
63. Reitzel LR, Li Y, Stewart DW, et al. Race moderates the effect of menthol cigarette use on short-term smoking abstinence. *Nicotine Tob Res.* May 2013;15(5):883-889.
64. Celebucki CC, Wayne GF, Connolly GN, Pankow JF, Chang EI. Characterization of measured menthol in 48 U.S. cigarette sub-brands. *Nicotine Tob Res.* Aug 2005;7(4):523-531.
65. Fu SS, Okuyemi KS, Partin MR, et al. Menthol cigarettes and smoking cessation during an aided quit attempt. *Nicotine Tob Res.* Mar 2008;10(3):457-462.
66. Okuyemi KS, Ahluwalia JS, Ebersole-Robinson M, Catley D, Mayo MS, Resnicow K. Does menthol attenuate the effect of bupropion among African American smokers? *Addiction.* Oct 2003;98(10):1387-1393.

67. Okuyemi KS, Faseru B, Sanderson Cox L, Bronars CA, Ahluwalia JS. Relationship between menthol cigarettes and smoking cessation among African American light smokers. *Addiction.* Dec 2007;102(12):1979-1986.
68. Faseru B, Nollen NL, Mayo MS, et al. Predictors of cessation in African American light smokers enrolled in a bupropion clinical trial. *Addict Behav.* Mar 2013;38(3):1796-1803.
69. Ahluwalia JS, Harris KJ, Catley D, Okuyemi KS, Mayo MS. Sustained-release bupropion for smoking cessation in African Americans: a randomized controlled trial. *JAMA.* Jul 24-31 2002;288(4):468-474.
70. Muscat JE, Richie JP, Jr., Stellman SD. Mentholated cigarettes and smoking habits in whites and blacks. *Tob Control.* Dec 2002;11(4):368-371.
71. Okuyemi KS, Ebersole-Robinson M, Nazir N, Ahluwalia JS. African-American menthol and nonmenthol smokers: differences in smoking and cessation experiences. *J Natl Med Assoc.* Sep 2004;96(9):1208-1211.
72. Gardiner PS. The African Americanization of menthol cigarette use in the United States. *Nicotine Tob Res.* Feb 2004;6 Suppl 1:S55-65.
73. Sutton CD, Robinson RG. The marketing of menthol cigarettes in the United States: populations, messages, and channels. *Nicotine Tob Res.* Feb 2004;6 Suppl 1:S83-91.
74. Brown & Williamson. File Note. Kool Advertising 480000 to 680000. 1968, November 13(Bates No. 681700858/0880). http://legacy.library.ucsf.edu/tid/uyi70f00. Accessed October 19, 2010.
75. Market Science Associates Inc. The Growth of Menthols, 1933-1977. 1978(Bates No. 670586709/6785). http://legacy.library.ucsf.edu/tid/ank50f00. Accessed October 19, 2010.
76. Wackowski OA, Delnevo CD, Lewis MJ. Risk perceptions of menthol cigarettes compared with nonmenthol cigarettes among New Jersey adults. *Nicotine Tob Res.* Jul 2010;12(7):786-790.
77. Cokkinides V, Bandi P, McMahon C, Jemal A, Glynn T, Ward E. Tobacco control in the United States--recent progress and opportunities. *CA Cancer J Clin.* Nov-Dec 2009;59(6):352-365.
78. Nelson DE, Mowery P, Asman K, et al. Long-term trends in adolescent and young adult smoking in the United States: metapatterns and implications. *Am J Public Health.* May 2008;98(5):905-915.
79. Institute of Medicine. *Growing Up Tobacco Free: Preventing nicotine addiction in children and youths.* Washington, D.C.: National Academy Press; 1994.
80. U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health;2012.
81. Doll R, Peto R, Boreham J, Sutherland I. Mortality in relation to smoking: 50 years' observations on male British doctors. *British Medical Journal.* Jun 26 2004;328(7455):1519.
82. Jha P, Ramasundarahettige C, Landsman V, et al. 21st-century hazards of smoking and benefits of cessation in the United States. *N Engl J Med.* Jan 24 2013;368(4):341-350.
83. Pirie K, Peto R, Reeves GK, Green J, Beral V, Million Women Study C. The 21st century hazards of smoking and benefits of stopping: a prospective study of one million women in the UK. *Lancet.* Jan 12 2013;381(9861):133-141.
84. Doll R, Peto R, Boreham J, Sutherland I. Mortality from cancer in relation to smoking: 50 years observations on British doctors. *British Journal of Cancer.* Feb 14 2005;92(3):426-429.
85. U.S. Department of Health and Human Services. Chapter 7: The Impact of Smoking on Disease and the Benefits of Smoking Reduction. *The health consequences of smoking: a report of the Surgeon General*. Washington, D.C.: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2004.
86. Fagerstrom K, Aubin HJ. Management of smoking cessation in patients with psychiatric disorders. *Current medical research and opinion.* Feb 2009;25(2):511-518.
87. U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration,, Center for Behavioral Health Statistics and Quality,. Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings. 2013; http://www.samhsa.gov/data/NSDUH/2012SummNatFindDetTables/NationalFindings/NSDUHresults2012.htm. Accessed Oct 22, 2013.

88. Levy DT, Pearson JL, Villanti AC, et al. Modeling the future effects of a menthol ban on smoking prevalence and smoking-attributable deaths in the United States. *Am J Public Health.* Jul 2011;101(7):1236-1240.
89. Kreslake JM, Wayne GF, Connolly GN. The menthol smoker: tobacco industry research on consumer sensory perception of menthol cigarettes and its role in smoking behavior. *Nicotine Tob Res.* Apr 2008;10(4):705-715.
90. Yerger VB, McCandless PM. Menthol sensory qualities and smoking topography: a review of tobacco industry documents. *Tob Control.* May 2011;20 Suppl 2:ii37-43.
91. Food and Drug Administration. *Guidance for Industry and FDA Staff: Use of "Light," "Mild," "Low," or Similar Descriptors in the Label, Labeling, or Advertising of Tobacco Products.* Washington, D.C., June 2010.
92. Centers for Disease Control and Prevention. *Best Practices for Comprehensive Tobacco Control Programs-2007.* Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, October 2007.
93. National Cancer Institute. *The Role of the Media in Promoting and Reducing Tobacco Use.* Tobacco Control Monograph No. 19. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute. NIH Pub. No. 07-6242, June 2008.
94. Mitch Zellar. Presentation: FDA Regulation of Tobacco: A Review of 2013, What to Expect in 2014. Food and Drug Law Institute Conference on FDA Regulation of Tobacco, October 29, 2013. Washington, D.C.
95. New York City Department of Health et al. Citizen Petition to Food & Drug Administration, Track and Trace System to Monitor Manufacturing and the Flow of Tobacco Products from Production through Distribution to Retail Outlets. March 6, 2013.
96. Food, Drug and Cosmetic Act as amended by the Family Smoking Prevention and Tobacco Control Act, §920.
97. Joossens L, Raw M. Cigarette smuggling in Europe: who really benefits? *Tob Control.* 1998;7(1):66-71.
98. Joossens L, Raw M. How can cigarette smuggling be reduced? *BMJ.* Oct 2000;321(7266):947-950.
99. Joossens L, Raw M. Turning off the tap: the real solution to cigarette smuggling. *Int J Tuberc Lung Dis.* Mar 2003;7(3):214-222.
100. Joossens L, Raw M. Progress in combating cigarette smuggling: controlling the supply chain. *Tob Control.* Dec 2008;17(6):399-404.
101. Square D. Cigarette smuggling finds a home in the west. *CMAJ.* Jan 1998;158(1):95-97.
102. Stoklosa M, Ross H. Contrasting academic and tobacco industry estimates of illicit cigarette trade: evidence from Warsaw, Poland. *Tob Control.* Aug 13 2013.
103. Eriksen M MJ, Ross H. *The Tobacco Atlas.* Fourth Edition. Atlanta, GA: American Cancer Society; New York, NY: World Lung Foundation; 2012.
104. Alderman J. *Strategies to Combat Illicit Tobacco Trade.* Tobacco Control Legal Consortium 2012.
105. Johnson RA, Gerstein DR. Initiation of use of alcohol, cigarettes, marijuana, cocaine, and other substances in US birth cohorts since 1919. *Am J Public Health.* Jan 1998;88(1):27-33.
106. Prevent All Cigarette Trafficking Act (PACT Act), Public Law No: 111-154, 124 STAT. 1087.
107. *See, e.g.*, Environmental Protection Agency, Notice of Proposed Rulemaking, Protection of Stratospheric Ozone: Process for Exempting Critical Uses From the Phaseout of Methyl Bromide, August 25, 2004, 40 CFR Part 82, 69 Fed. Reg. 52366-01 at 52385; Department of Agriculture, Animal and Plant Health Inspection Service, *Importation of Fresh Hass Avocado Fruit Grown in Michoacan, Mexico*, Feb. 5, 1997, 62 Fed. Reg. 5293-01, 5300.
108. Department of Agriculture. Animal and Plant Health Inspection Service, *Importation of Fresh Hass Avocado Fruit Grown in Michoacan, Mexico*, Feb. 5, 1997, 62 Fed. Reg. 5293-01, 5300.
109. Environmental Protection Agency. *Protection of Stratospheric Ozone: Reconsideration of Petition Criteria and Incorporation of Montreal Protocol Decisions*, Aug. 4, 1998, 63 Fed. Reg. 41626, 41633.
110. Nakkash R, Lee K. Smuggling as the "key to a combined market": British American Tobacco in Lebanon. *Tob Control.* Oct 2008;17(5):324-331.

111. Legresley E, Lee K, Muggli ME, Patel P, Collin J, Hurt RD. British American Tobacco and the "insidious impact of illicit trade" in cigarettes across Africa. *Tob Control.* Oct 2008;17(5):339-346.
112. Collin J, Legresley E, MacKenzie R, Lawrence S, Lee K. Complicity in contraband: British American Tobacco and cigarette smuggling in Asia. *Tob Control.* Dec 2004;13 Suppl 2:ii104-111.
113. Lee K, Collin J. "Key to the future": British American tobacco and cigarette smuggling in China. *PLoS Med.* Jul 2006;3(7):e228.
114. Lee K, Gilmore AB, Collin J. Breaking and re-entering: British American Tobacco in China 1979-2000. *Tob Control.* Dec 2004;13 Suppl 2:ii88-95.
115. MacKenzie R, Collin J, Sopharo C, Sopheap Y. "Almost a role model of what we would like to do everywhere": British American Tobacco in Cambodia. *Tob Control.* Dec 2004;13 Suppl 2:ii112-117.
116. Kelton MH, Jr., Givel MS. Public policy implications of tobacco industry smuggling through Native American reservations into Canada. *International journal of health services : planning, administration, evaluation.* 2008;38(3):471-487.
117. Mazis M, Ringold D, Perry E, Denman D. Perceived age and attractiveness of models in cigarette advertisements. *Journal of Marketing.* 1992:22-37.
118. Widome R, Brock B, Noble P, Forster JL. The relationship of neighborhood demographic characteristics to point-of-sale tobacco advertising and marketing. *Ethn Health.* 2013;18(2):136-151.
119. Henriksen L, Schleicher NC, Dauphinee AL, Fortmann SP. Targeted advertising, promotion, and price for menthol cigarettes in California high school neighborhoods. *Nicotine Tob Res.* Jan 2012;14(1):116-121.
120. Richardson A, Ganz O, Pearson J, Celcis N, Vallone D, Villanti AC. How the Industry Is Marketing Menthol Cigarettes: The Audience, the Message and the Medium. *Am J Prev Med.*Under review.
121. Kaufman N, Castrucci B, Mowery P, Gerlach K, Emont S, Orleans C. Changes in adolescent cigarette-brand preference, 1989 to 1996. *Am J Health Behav.* 2004 Jan-Feb 2004;28(1):54-62.
122. Glanz K, Sutton N, Jacob Arriola K. Operation storefront Hawaii: tobacco advertising and promotion in Hawaii stores. *J Health Commun.* 2006 Oct-Nov 2006;11(7):699-707.
123. Cummings KM, Giovino G, Mendicino AJ. Cigarette advertising and black-white differences in brand preference. *Public Health Rep.* Nov-Dec 1987;102(6):698-701.
124. Landrine H, Klonoff EA, Fernandez S, et al. Cigarette advertising in Black, Latino, and White magazines, 1998-2002: an exploratory investigation. *Ethn Dis.* Winter 2005;15(1):63-67.
125. White VM, White MM, Freeman K, Gilpin EA, Pierce JP. Cigarette promotional offers: who takes advantage? *Am J Prev Med.* Mar 2006;30(3):225-231.
126. Poston WS, Jahnke SA, Haddock CK, et al. Menthol cigarette pricing at military and community retail outlets in the United States. *BMC Public Health.* 2012;12:731.
127. Department of Defense Instruction 1330.09. 2005; http://www.dtic.mil/whs/directives/corres/pdf/133009p.pdf. Accessed 21 Oct, 2013.
128. Yerger VB, Przewoznik J, Malone RE. Racialized geography, corporate activity, and health disparities: tobacco industry targeting of inner cities. *J Health Care Poor Underserved.* Nov 2007;18(4 Suppl):10-38.
129. Seidenberg AB, Caughey RW, Rees VW, Connolly GN. Storefront cigarette advertising differs by community demographic profile. *Am J Health Promot.* Jul-Aug 2010;24(6):e26-31.
130. Pearson JL, Cantrell J, Ganz O, et al. Lorillard brands' availability, price, and advertising: association with neighborhood. 19th Annual Society for Research on Nicotine and Tobacco Meeting; 2013; Boston, MA.

Villanti et al. BMC Public Health (2017) 17:983
DOI 10.1186/s12889-017-4987-z

Appendix E

BMC Public Health

RESEARCH ARTICLE Open Access

Menthol cigarettes and the public health standard: a systematic review

Andrea C. Villanti[1,2,3*], Lauren K. Collins[1], Raymond S. Niaura[1,3,4], Stacey Y. Gagosian[5] and David B. Abrams[1,3,4]

Abstract

Background: Although menthol was not banned under the Tobacco Control Act, the law made it clear that this did not prevent the Food and Drug Administration from issuing a product standard to ban menthol to protect public health. The purpose of this review was to update the evidence synthesis regarding the role of menthol in initiation, dependence and cessation.

Methods: A systematic review of the peer-reviewed literature on menthol cigarettes via a PubMed search through May 9, 2017. The National Cancer Institute's Bibliography of Literature on Menthol and Tobacco and the FDA's 2011 report and 2013 addendum were reviewed for additional publications. Included articles addressing initiation, dependence, and cessation were synthesized based on study design and quality, consistency of evidence across populations and over time, coherence of findings across studies, and plausibility of the findings.

Results: Eighty-two studies on menthol cigarette initiation ($n = 46$), dependence ($n = 14$), and cessation ($n = 34$) were included. Large, representative studies show an association between menthol and youth smoking that is consistent in magnitude and direction. One longitudinal and eight cross-sectional studies demonstrate that menthol smokers report increased nicotine dependence compared to non-menthol smokers. Ten studies support the temporal relationship between menthol and reduced smoking cessation, as they measure cessation success at follow-up.

Conclusions: The strength and consistency of the associations in these studies support that the removal of menthol from cigarettes is likely to reduce youth smoking initiation, improve smoking cessation outcomes in adult smokers, and in turn, benefit public health.

Keywords: Cessation, Dependence, Policy, Youth tobacco use, Public health

Background

Menthol has been added to tobacco products as a characterizing flavor since at least the 1920s, but many of the current menthol brands were introduced in the mid-1950s [1, 2]. In 2013, the most recent year of data from the Federal Trade Commission, menthol cigarettes represented 30% of the cigarette market [3]. Tobacco companies have also noted that the menthol segment of the market continues to grow [4], including Reynolds American and Philip Morris USA who have continued to expand their distribution of menthol cigarettes in the past year [5].

The Tobacco Control Act banned all candy and fruit flavors as characterizing flavors of cigarettes. The law did not include menthol in that ban, nor did it address flavors in non-cigarette tobacco products [6]. However, the Act makes clear that the Food and Drug Administration (FDA) has the authority to issue a product standard to ban menthol in cigarettes, or any other tobacco product, to protect public health. In fact, the Act required the Tobacco Product Scientific Advisory Committee (TPSAC), as its first order of business, to review the state of the science on menthol and make a recommendation to the FDA based on the public health standard [7]. TPSAC undertook a review of the science and issued a comprehensive report concluding that it would be in

* Correspondence: andrea.villanti@uvm.edu
[1]The Schroeder Institute for Tobacco Research and Policy Studies at Truth Initiative, Washington, DC, USA
[2]Vermont Center on Behavior and Health, Department of Psychiatry, University of Vermont, Burlington, VT, USA
Full list of author information is available at the end of the article

the interest of public health to remove menthol cigarettes from the market [8]. Further, FDA, conducted an independent review of the science in 2013. This report concluded that it is "likely that menthol cigarettes pose a public health risk above that seen with non-menthol cigarettes" [9].

The purpose of the current review was to update the state of the evidence on menthol in cigarettes with respect to two of the three key elements of the public health standard: first, whether there is an increased or decreased likelihood that those who do not currently use tobacco products, most notably youth, will start to use tobacco products; and second, whether there is an increased or decreased likelihood that existing users of tobacco products will stop using such products [10]. In addition to providing a third independent summary of the evidence on menthol, this study highlights findings published after the FDA's 2013 review.

Methods

We undertook a systematic review using a PubMed search of the peer-reviewed literature through May 9, 2017 with the terms "menthol AND cigarette*." The National Cancer Institute's Bibliography of Literature on Menthol and Tobacco [11] and the FDA's original 2011 report [9] and 2013 addendum [12] were reviewed for additional publications not captured in the PubMed search. Articles published prior to 2013 were reviewed for inclusion and coded by AV; articles published after 2013 were reviewed for inclusion by LC and coded by LC and AV. In 2016, the review was moved into a centralized database and searches were rerun within Eppi-Reviewer 4 (EPPI-Centre, University of London); at this time, all abstracts were double-checked against the inclusion criteria for quality control purposes. The May 2017 search update was conducted within the Eppi-Reviewer platform. Lab-based studies and studies with no direct comparison between menthol and non-menthol use were excluded. Published reviews, commentaries, case reports, editorials, letters to the editor, meeting proceedings, and policy statements were also excluded. Included studies were classified into at least one of 6 categories, including 1) Initiation; 2) Dependence; 3) Cessation; 4) Prevalence; 5) Marketing; and 6) Policies.

Since the main goal of the current review was to update a narrative review on the Initiation, Dependence, and Cessation categories and a range of study types were included, we did not employ a standardized assessment of the quality of included studies (e.g., PRISMA checklist). To synthesize the evidence for these three categories, we:

(1) Examined the methods and designs of the studies, the rigor with which they were conducted, and the limits of interpreting data with respect to the population, place, and time of the study;
(2) Categorized individual studies according to their methods and design and evaluated studies that used comparable methods to determine consistency of the evidence across populations and over time. We examined evidence across these comparable studies to assess the strength of the association and to determine if a temporal relationship was present between menthol cigarette use and smoking initiation or cessation;
(3) Evaluated the body of scientific evidence to determine whether findings of individual studies were coherent with each other and with our broader understanding of tobacco use in the United States; and
(4) Considered the plausibility of these findings in the context of tobacco industry and related documents.

Finally, we asked whether positive associations exist and whether chance, bias, and confounding could be ruled out with reasonable confidence. In keeping with a classification scheme based on FDA's public health standard, and recognizing that decision-makers must often act in the face of scientific uncertainty, we asked whether the evidence in a particular area was sufficient to conclude that a relationship was more likely than not, whether the evidence shows that a relationship was at least as likely as not, whether the evidence is insufficient to conclude that a relationship was more likely than not, or whether there was insufficient evidence to make a determination of strength of evidence. The focus of the evidence synthesis was on studies conducted in the United States; data presented from other countries is noted as such throughout the text.

Results

Of the 131 empirical articles on menthol cigarettes included in the full review (see Fig. 1), 82 were relevant to initiation ($n = 46$; Additional file 1: Table S1), dependence ($n = 14$; Additional file 2: Table S2), and cessation ($n = 34$; Additional file 3: Table S3). The remaining 49 articles addressed other topics: prevalence ($n = 13$), marketing ($n = 22$), and policies ($n = 14$). Thirty-three of these articles were published after 2013. Details on the findings by study category are described in detail below.

Initiation

The prevalence of menthol cigarette use is higher in youth than young adults and adults

A 2015 study using 2004–2010 data from the National Survey on Drug Use and Health (NSDUH), adjusted for misclassification of menthol brand, showed that from 2008 to 10, 56.7% of youth smokers (aged 12–17)

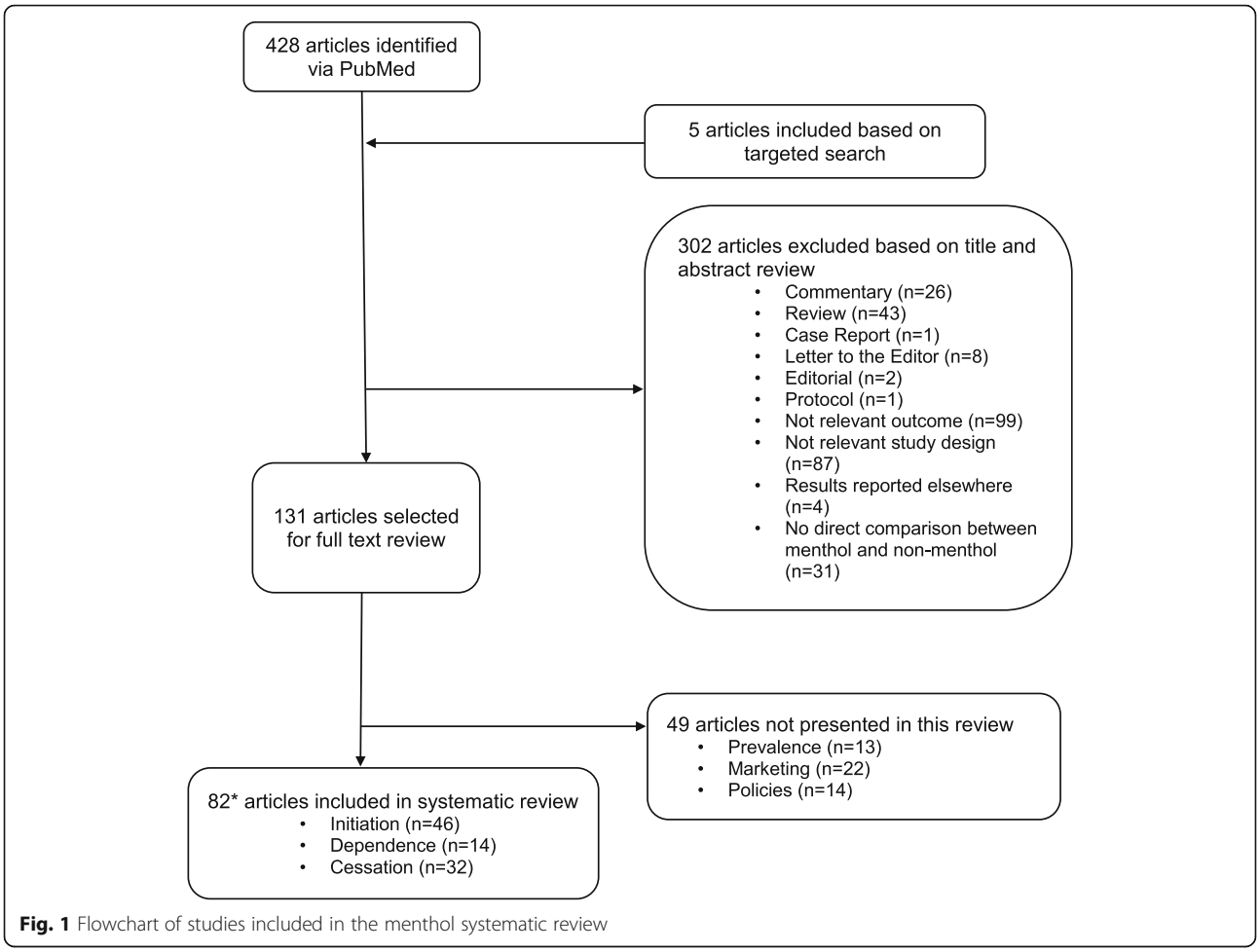


Fig. 1 Flowchart of studies included in the menthol systematic review

smoked menthol cigarettes [13]. This compares with an overall menthol cigarette prevalence (youth and adults) of 35.2% and represents 1.2 million menthol smoking youth. A 2016 follow-up study in NSDUH highlighted that the percentage of menthol cigarette smokers increased 4.1 percentage points between 2008–2010 and 2012–2014, with youth smokers remaining the age group with the highest prevalence of menthol cigarette use [14]. These findings were also confirmed using 2013–2014 data from the Population Assessment of Tobacco and Health (PATH) Study [15]. Among current cigarette smokers, 59.5% of youth used mentholated cigarettes compared to 37.1% of adults. When looking only at exclusive cigarette smokers, the prevalence of mentholated cigarette use remained higher in youth (56.5%) compared to adults (39.5%).

Black smokers report a high prevalence of menthol cigarette use, regardless of age [13, 16–21]. A cross-sectional study of adult daily smokers found that nearly 80% of black smokers smoked menthol cigarettes, the highest prevalence across racial/ethnic groups [22]. Controlling for gender, race/ethnicity, household income and days smoked in the past month, the odds of smoking mentholated brands were more than three-fold higher in the youngest age groups (12–15 and 16–17) of smokers compared to smokers aged 35 and older in both 2008–2010 [13] and 2012–2014 [14]. These estimates are slightly higher than those published in the 2009 *NSDUH Report: Use of Menthol Cigarettes* [16] and NSDUH analyses by Caraballo and Asman [19] and Rock et al. [18], but account for two more years of data collection and adjustment for misclassification of menthol status. Together, these studies demonstrate the stability of these nationally-representative estimates over seven years highlighting higher rates of menthol use in youth compared to adults from 2004 to 2014.

There is a persistent age gradient in menthol cigarette use among the youngest smokers

Results from the 1999, 2000, and 2002 National Youth Tobacco Survey (NYTS), a survey administered to approximately 25,000 middle and high school students in each wave, confirm a statistically significantly higher prevalence of menthol cigarette use among middle

school students compared to high school students [23–25]. Results differ for some racial/ethnic subgroups [26, 27]. In the 2006 NYTS, 57.1% of middle school smokers reported that their usual brand was menthol compared to 43.1% of high school smokers [28]. Data combined for years 2004, 2006, and 2009 of the NYTS showed that 49.4% of middle school current smokers reported smoking menthol cigarettes compared to 44.9% of high school current smokers [19]. In 2004 and 2006 NYTS, Newport was the second most popular brand among youth smokers [29].

Studies of youth and adults published prior to 2013 highlight that the highest prevalence of menthol cigarette use occurs among youth smokers, followed by young adult smokers, and that both are significantly higher than menthol cigarette use among older adult smokers [17–19]. These findings are consistent with studies using more recent data that were published after 2013 [13–15, 30].

Other recent national studies examining adults only consistently report that young adult smokers (aged 18–24 or 18–25) are significantly more likely to use menthol cigarettes than older adult smokers (aged 25+ or 26+), even after controlling for other potential confounders including socioeconomic status, sexual orientation [31], and psychological distress [32]. One study in a national sample of young adults aged 18–34 found that menthol cigarette smokers were significantly younger than non-menthol cigarette smokers in bivariate analyses, but this did not persist in multivariable models, likely due to the restricted age range of the sample [33].

Menthol cigarette use among youth has not decreased in the past decade, despite decreases in non-menthol cigarette use

Giovino et al. showed that the prevalence of smoking menthol cigarettes remained constant among youth (aged 12–17) from 2004 to 2010, at the same time that the prevalence of non-menthol cigarette use decreased significantly in this age group [13]. Furthermore, menthol cigarette use significantly increased over this time period in young adults (aged 18–25) while the prevalence of non-menthol cigarette use decreased significantly. These findings were consistent with the 2011 NSDUH report on *Recent Trends in Menthol Cigarette Use* [17]. In updated NSDUH data from 2014, menthol cigarette prevalence was higher than non-menthol cigarette prevalence in youth and young adults [14].

Recent youth initiates are significantly more likely to use menthol cigarettes than youth who have smoked longer than one year

Estimates from the NYTS and NSDUH also demonstrate increased menthol cigarette use among recent youth initiates. Two studies [16, 34] combining waves of national data on youth smoking report a higher prevalence of menthol cigarette use among youth who have been smoking less than one year compared to those who have smoked more than one year. One of the studies combined data from five years of the NSDUH (2004–2008) and the other used two years of data from the NYTS (2000 and 2002). In the NSDUH study, past month smoking of menthol cigarettes was more likely among smokers aged 12–17 who began smoking in the past 12 months than among those who had been smoking for more than a year (49.2% vs. 43.8%); findings were similar in young adults where past-year initiates had higher menthol use than longer-term smokers (40.2% vs. 36.4%) [16]. The 2011 NSDUH report on menthol also reported that the prevalence of menthol use in recent initiates among all participants aged 12+ increased during 2007–2010 as compared to 2004–2006 and that past month menthol use was higher among recent initiates compared to longer-term smokers in both time periods [17]. In the NYTS study, middle school students who had been smoking for less than 1 year were significantly more likely to smoke menthol cigarettes compared with middle school students who had been smoking for more than 1 year (62.4% vs. 53.3%, $p = 0.002$) [34]. Two recent analyses in the NYTS data [19, 28] did not find a significant relationship between menthol cigarette use and smoking initiation among adolescents. One study using 2006 NYTS data shows that the proportion of middle school smokers whose usual brand was menthol was higher among those who smoked for 1 year or more (54.7%) than among those who smoked for less than a year (42.2%) [28]. Among high school youth, these percentages were similar for smokers who had smoked for less than and for more than 1 year (42.8% vs. 43.1%). Another study combining data across years of the NYTS (2004, 2006, and 2009) used cigarettes smoked per day and days smoked per month as proxy measures for early "stages" of use (initiation) and showed no difference in the prevalence of menthol use by "stage" [19].

Longitudinal studies demonstrate that initiation with menthol cigarettes facilitates progression to established use in young smokers

Prior to 2014, one cross-sectional study and two longitudinal studies assessed the impact of menthol initiation on smoking behavior. Conducted in a southeastern city, the cross-sectional study showed that black middle and high school students, who smoke at lower rates than whites, greatly accelerate their cigarette consumption when their brand of choice contains menthol [35]. African American menthol users were between 1.7 and 3.5 more likely to fall into a higher category of cigarette

consumption than whites. A longitudinal study, conducted by Nonnemaker et al. [36], documents that adolescents who initiated smoking with menthol cigarettes during the course of a cohort study were more likely to progress to established smoking by the end of the three-year study compared to those who initiated with non-menthol cigarettes. The stringency of the definition of "established smoking" in this study (i.e., at least 100 cigarettes lifetime plus smoking on 20–30 of the past 30 days) provides strong evidence for the relationship between menthol cigarette use and progression to regular use given the typical adolescent definition of current cigarette use as any use in the past 30 days. The second longitudinal study, published by Dauphinee et al. [37] shows that recognition of Newport cigarettes, a leading menthol brand, was associated with smoking experimentation in a large sample of adolescent never-smokers at 12-month follow-up.

Findings from four recent cross-sectional studies further support these findings. One cross-sectional study of a nationally-representative sample of Canadian high school students showed that menthol smoking youth had a significantly higher odds of reporting intent to continue smoking compared to non-menthol smoking youth [38]. These findings held when examining established and experimental smokers separately. A second cross-sectional study examined changes in smoking behavior using a national sample of young adult smokers and showed that menthol cigarette use nearly doubled the odds of increased smoking behavior, including transitioning from no smoking to current smoking or from someday to every day smoking in the past year [39]. These findings are consistent with recent analyses in Wave 1 of the PATH study that documented a strong association between first use of a flavored tobacco product and current tobacco use among youth and adults [15]. A fourth cross-sectional study, which conducted regression analyses using data from four nationally representative samples of youth and adult current smokers, found that current menthol use was not associated with an increased odds of being a daily versus non-daily smoker in youth and adults [40].

Young smokers are likely to remain with their "starter" type of cigarette over time

Data from the National Youth Smoking Cessation Survey (NYSCS), a two-year (2003–2005) longitudinal telephone study of adolescent and young adult cigarette smokers aged 16–24 confirm that 85% of baseline menthol smokers remained menthol smokers at 24 months and 93% of baseline non-menthol smokers remained non-menthol smokers [41]. In a study published in 2013 by Nonnemaker et al., the majority of adolescent smokers who initiated with menthol cigarettes remained menthol smokers at follow-up (63%); this was similar to the proportion of adolescent smokers who initiated with non-menthol cigarettes and remained with non-menthol smokers at follow-up (62%) [36].

Two studies published after 2013 support these findings. One study, conducted over one year in the Truth Initiative Young Adult Cohort, bolsters the findings that the majority of young adult smokers, aged 18–34, remain with their initial type of cigarette over time [42]. In this study, young adults smokers who initiated with menthol cigarettes were more than eight times more likely to remain menthol cigarette smokers than those who initiated with non-menthol cigarettes. The second study, focused more broadly on flavored tobacco use in Wave 1 of the PATH study, found first use of a flavored tobacco product was associated with a more than two-fold higher prevalence of exclusive menthol cigarette use in adults, with young adults being more likely to use menthol cigarettes [15].

The findings regarding an age gradient in menthol cigarette use – Increased levels of menthol smoking in the youngest age groups – are not attributable to menthol brand misclassification or socioeconomic status

Misclassification of menthol cigarette use has been identified in youth studies [28] and tobacco control researchers have also raised the notion that menthol cigarette use may be associated with economic pressure to use fewer cigarettes [43], thus menthol use may be due to lower socioeconomic status. These data show that the age gradient in use is not an artifact of misclassification of menthol use [23]. They also highlight that use of menthol cigarettes is not explained by socioeconomic status, assessed as household income.

Four papers published after 2013 confirm these earlier results. Analyses using 2008–2009 NSDUH data support that young adults (aged 18–25) are significantly more likely to use menthol cigarettes than older adults, after controlling for age, gender, race/ethnicity, education, income, marital status, health insurance, cigarettes per day, time to first cigarette, and psychological distress [32]. Giovino et al. addressed potential misclassification of menthol brand among youth and adults in 2008–2010 NSDUH data, showing a persistent age gradient in menthol cigarette use across gender, race/ethnicity, household income, and number of days smoked per month [13]. These findings held in updated analyses of 2012–2014 NSDUH data [14]. A fourth study published in 2016 using 2012–2013 NSDUH data showed that menthol cigarette use was also not explained by urban/rural differences [44].

Menthol cigarette smoking is correlated with other risk behaviors in young people

Menthol cigarette smoking has been associated with other tobacco use in young adults (small cigars [45] and other flavored tobacco products [46]) and alcohol and

marijuana use in youth [47–49]. In a community-based sample of adolescents in the U.S., past 30-day menthol cigarette smokers reported higher lifetime marijuana use, but not marijuana use in the past 30 days compared to non-menthol smokers [48]. In a sample of adolescent daily smokers seeking cessation treatment, menthol cigarette use was correlated with past 30-day marijuana use [48].

In a nationally-representative sample of Canadian 7th through 12th grade students published after 2013, menthol cigarette smokers were significantly more likely to report binge drinking or using marijuana in the past year compared to non-menthol smokers [47]. In national NSDUH data collected in 2013 and 2014 among participants aged 12 and older, a higher percent of marijuana/menthol cigarette users were 12–17 years of age compared to other usage groups (i.e., marijuana/non-menthol cigarettes, menthol cigarettes only, non-menthol cigarettes only) [49].

The tobacco industry has long understood the appeal of menthol cigarettes as starter products for youth

Historical tobacco industry documents underscore menthol brands as starter products for youth (i.e., "Menthol brands have been said to be good starter products because new smokers appear to know that menthol covers up some of the tobacco taste and they already know what menthol tastes like, vis-à-vis candy" [50]) and recognize the importance of adolescent smokers to the success of menthol brands (i.e., "The success of Newport has been fantastic during the past few years. Our profile taken locally shows this brand being purchased by black people (all ages), young adults (usually college age), but the base of our business is the high school student" [51]). Recent tobacco industry document reviews have also underscored the relationship between menthol cigarette use, youth smoking initiation and tobacco dependence, as understood and manipulated by the tobacco industry [52–54]. Data from financial analysts support that the menthol marketplace is strongly influenced by youth smoking. Tobacco industry experts at Morgan Stanley noted in 2012 that menthol cigarettes continue to have a higher market share in younger age groups, despite the fact that youth smoking continues to decline [55]. Increased market share of menthol cigarettes among youth has also been documented outside the U.S. [56, 57].

In two studies published after 2013, the appeal of menthol flavoring was demonstrated to influence intention to smoke and initial smoking [58, 59].

Summary - initiation

Fifteen years of national studies of tobacco use across different populations and time periods arrive at the same conclusions: there is a strong pattern of a higher – and growing – proportion of menthol cigarette use among youth (aged 12–17) than adults, and especially among younger adolescents and recent youth initiates. The results from large, representative studies provide evidence of an association between menthol and youth smoking that is robust and consistent in magnitude and direction and is unlikely to be due to bias, confounding, or chance. Among all youth and young adults, not just current smokers, the prevalence of smoking non-mentholated brands decreased from 2004 to 2014; as of 2014, menthol cigarettes were more prevalent than non-menthol cigarettes in youth and young adults, indicating that menthol cigarettes are gaining market share in these age groups.

More particularly, the replication of these findings over time using different studies and populations provides evidence of consistency. Data showing a high prevalence of menthol use among youth, in addition to higher prevalence among younger adolescents and recent initiates, and stable or increasing menthol cigarette use over time – despite reductions in non-menthol cigarette use – supports coherence of the evidence on menthol and youth smoking. Plausibility of the relationship between menthol and youth smoking is corroborated by historic industry and related documents on the development and marketing of mentholated cigarettes to youth [50, 51]. The magnitude and statistical significance of the data on the increasing proportion of menthol use and brand preference among youth over time reveals that this is a national phenomenon. Additional analyses exclude misclassification and socioeconomic status as explanations for the high prevalence of menthol cigarette use among youth.

Dependence

Youth menthol smokers report greater levels of nicotine dependence than youth non-menthol smokers

Of eight studies assessing nicotine dependence among youth [28, 34, 36, 60–64], five demonstrate significantly higher endorsement of dependence symptoms among menthol smokers compared to non-menthol smokers [28, 34, 36, 60, 62]. Of the three studies using NYTS data from 2000, 2002, 2004, and 2006, two [28, 62] report that young menthol cigarette users have a significantly shorter first time-to-cigarette after waking, which is a hallmark of nicotine dependence [65], after adjusting for gender, race, grade, number of days smoked in the past 30 days and number of cigarettes smoked per day. These two studies also show greater endorsement of withdrawal symptoms among youth menthol smokers, particularly, craving [28, 62], and feeling irritable or restless after not smoking for a few hours [28]; these findings also adjusted for gender, race, grade, number of

days smoked in the past 30 days and number of cigarettes smoked per day. This is consistent with the third NYTS paper that highlights higher than median scores on a nicotine dependence scale among youth menthol compared to non-menthol smokers, controlling for age, gender, race/ethnicity, and smoking behavior (i.e., length, frequency, and level of smoking) [34]. A smaller cross-sectional study of adolescents recruited for a cessation treatment study by Collins and Moolchan also reported a greater proportion of adolescent menthol smokers smoking within five minutes of waking compared to non-menthol smokers [60]. Further, a national longitudinal study of U.S. adolescents reported that initiating smoking with menthol cigarettes was associated with higher nicotine dependence score, controlling for gender, age, race/ethnicity [36]. Two of the remaining three studies showed no differences in adolescent nicotine dependence in menthol versus non-menthol smokers using the Hooked on Nicotine Checklist [61, 63]. The third study, which used data from four nationally representative samples of youth and adults, found that menthol smokers do not report a higher Heaviness of Smoking Index, compared to non-menthol smokers [64].

Adult menthol smokers report shorter time to first cigarette than non-menthol smokers

Six studies in adults also focus on nicotine dependence among menthol compared to non-menthol smokers by assessing time to first cigarette [6, 66–70]. Two studies in women show that female menthol smokers have a significantly shorter time to first cigarette than non-menthol smokers [66, 68]. A study in a sample of current daily smokers from 1990 to 2001 reported a significantly shorter time to first cigarette among Black menthol users compared to non-menthol users, but this relationship was not present among White smokers [67].

Two studies in adult current smokers published after 2013 found no significant difference in time to first cigarette between menthol and non-menthol cigarette smokers [69, 70]. However, one other study was more aligned with earlier findings. The study of adult daily smokers found that menthol smokers were significantly more likely to report that they would hate to give up the first cigarette in the morning more than any other compared to non-menthol smokers [6].

Summary - dependence

Of fourteen studies published over a fifteen-year period, nine show that menthol smokers report increased nicotine dependence compared to non-menthol smokers [6, 28, 34, 36, 60, 62, 66–68]. The data on dependence among youth menthol smokers are particularly strong, given that four [28, 34, 36, 62] of the five studies showing an association control for a number of important confounders and one of these documents a temporal relationship between initiation with menthol cigarettes and the subsequent development of a higher level of nicotine dependence compared to initiation with a non-menthol cigarette [36]. All six of the studies in adults are cross-sectional, of which four demonstrate a shorter time-to-first cigarette among menthol smokers compared to non-menthol smokers. Three of these four studies examine women [66, 68] and Blacks [67], both groups targeted by tobacco industry marketing [71].

The findings on increased nicotine dependence among youth and adults are particularly important because they highlight a potential mechanism linking experimentation with cigarettes through progression to regular use, and subsequently, reduced cessation among menthol smokers. As a result, it is very likely that a ban on menthol in cigarettes would reduce nicotine dependence at the population level, thus having tremendous impacts on both initiation and cessation of cigarette use.

Cessation

In examining evidence on the relationship between menthol cigarette use and smoking cessation, we focused on studies that used cessation measures in addition to measures of quit attempts or intention to quit; as a result, there are several studies using intention to quit or quit attempts as the primary outcome that are not addressed in detail in this section [42, 72–74].

National cross-sectional studies

Five studies in the Tobacco Use Supplement to the Current Population Survey (TUS-CPS) measure cessation outcomes beyond quit attempts or intention to quit. Three studies [75–77] demonstrate that menthol users are less successful in quitting than non-menthol users despite increased quit attempts or intentions to quit. One of these studies found that past-year quit attempts were significantly increased in menthol compared to non-menthol smokers, but short-term (greater than 3 months and less than one year) and longer-term (greater than 3 months and less than five years) quit rates were significantly lower among those who smoke menthol cigarettes as compared to non-menthol cigarettes [75]. One study exploring cessation by race/ethnicity reported that non-Hispanic white, African American, and Puerto Rican menthol smokers were less likely to have quit smoking in the past five years compared to their non-menthol smoking counterparts [76]. Another study examining cessation by racial/ethnic groups found that cessation of at least six months was significantly reduced by 52% to 78% in African American, Hispanic/Latino, Asian American/Pacific Islander, and non-Hispanic white menthol smokers compared to non-menthol smokers [77]. Two studies found no

difference in cessation outcomes among menthol and non-menthol smokers [78, 79]. One study examined quitting behaviors among daily menthol and non-menthol smokers with similar cigarette consumption patterns and found no difference in quit attempts or greater than two-week abstinence by menthol status [78]. One study published after 2013 among current and past-year smokers (recent active smokers) found no difference in quit intention, quit attempts, or quit rate among menthol compared to non-menthol smokers [79].

Studies of adult smokers in the 2005 National Health Interview Survey (NHIS) Cancer Control Supplement corroborate the findings for reduced cessation among racial and ethnic subgroups from the TUS-CPS data. These studies report increased quit attempts in the past year among menthol compared to non-menthol smokers [80, 81] but significantly reduced cessation among African-American [80, 82] and Hispanic menthol smokers compared to non-menthol smokers [82]. One of these studies [82] also collapsed Hispanic and African-American smokers into one category and reported a statistically significant decrease of 45% in the odds of cessation among non-White menthol smokers compared to non-White non-menthol smokers. One study assessing quit duration as a cessation measure showed that there was a significant increase in quit duration among white female menthol smokers compared to white female non-menthol smokers, but no statistically significant differences among the other five demographic groups [81].

A more recent study examined the association between menthol use and the likelihood of being a former versus current smoker using data from the TUS-CPS (2010/11) and the NHIS (2005 and 2010). Analyses of the TUS-CPS found a statistically significant inverse association between menthol use and having quit smoking, but this was not reported when using the NHIS [83].

Community-based studies

One study from 1981 to 1999 in a hospital-based study of 19,545 current and former smokers showed that Black and White menthol users were significantly less likely to be former smokers compared to non-menthol users, but was no longer significant after controlling for age, sex, education, case–control status, years of smoking, and cigarettes per day [84]. Another study of 480 inner-city adult current smokers reported that menthol smokers reported a more recent quit attempt compared to non-menthol smokers (12 vs. 24 days; $p = 0.047$), but there was no difference in most recent or longest ever duration of abstinence [85]. A third study of 928 female smokers screened for a smoking cessation study reported that fewer menthol smokers reported a previous quit attempt of greater than 90 days compared to non-menthol smokers [68]. In a hospital-based study of 1067 adult smokers there was no significant effect of menthol use on motivation to quit and confidence to quit when adjusting for age, sex, race, income, education, and tobacco dependence [86].

Cohort studies

Of eight cohort studies examining differences in smoking cessation [87–94], three reported significantly lower quit rates among menthol smokers compared to non-menthol smokers at follow-up [90, 91, 94]. The study by Pletcher et al. [90] showed a 37% reduction in the odds of sustained cessation adjusted for age, sex, and ethnicity, but this result did not retain statistical significance after additional adjustment for educational level, marital status, employment, and health insurance status. The second study by Gandhi et al. [91] reported significant reductions in the odds of cessation of 68% and 57% among African American and Latino menthol smokers, respectively, at 4-week follow-up and a decrease of 52% in African Americans at 6-month follow-up, controlling for age in years, education, gender, employment status, type of insurance, cigarettes per day, age smoked for first time, awaken at night to smoke, time to use first cigarette of day, previous attempts to quit smoking, and the presence of a disease caused or aggravated by smoking. The third study published in 2014 by Lewis et al. [94] found menthol smokers to be less likely to quit (17.1% in African Americans, 24.2% in non-African Americans) than non-menthol smokers (21.9% in African Americans, 29.4% in non-African Americans).

Two additional studies by Reitzel et al. showed significant reductions in cessation in White menthol smokers, adjusted for covariates including age, partner status, income, and education; one for long-term (approximately 6 months) continuous abstinence in pregnant smokers [87] and a more recent publication for short-term abstinence in adult daily smokers [93]. Three other studies did not show a difference in abstinence at follow-up in menthol compared to non-menthol smokers [88, 89, 92]. The COMMIT study [89], which did not show a difference in cessation between menthol and non-menthol smokers, surveyed smokers in selected communities in the U.S. and Canada between 1988 and 1993. Possible reasons for the mixed results across the three studies include population sampling and recentness of the data.

Of the five studies showing a statistically significant difference in cessation by menthol smoking status, one [91] was conducted in a cessation clinic population from 2001 to 2005, one [90] in a large cohort of healthy young African American and European American men and women in four US cities from 1985 through 2000, one [94] in a sample of nationally representative U.S.

households from 2004 to 2009, and two others in community-based samples in Houston, Texas between 2004 and 2008 [87, 93]. The two other studies showing no effect of menthol on cessation were conducted in southern States from 2002 to 2009 [92] and in Minnesota between 2009 and 2011 [88]. We would note that the cigarette market has undergone dramatic changes over the past 10–15 years, including the introduction of a number of new menthol brands. Because of the differences in menthol levels and effects among brands [95], it is important to rely on the most recent data that reflects products currently on the market. Accordingly, we consider the COMMIT study less relevant to the question of adult cessation in the context of an FDA ban on menthol, as it includes older data. Additional weight should also be given to the cohort study conducted in a cessation clinic [91], as it reflects smokers who are motivated to quit and thus, controls for confounding by cessation cognitions and intention to quit.

Randomized controlled trials

Seven randomized controlled trials [96–102] in populations motivated to quit smoking explored the impact of menthol cigarette use on cessation. One study testing the impact of a phone survey and provider progress notes on smoking cessation among VA patients showed no difference six months after the intervention in smokers who had not smoked in the past seven days [96]. An additional study among stimulant-dependent adults found no significant association between cigarette type and smoking cessation [100]. However, five studies [97–99, 101, 102] testing the effect of pharmacotherapies and behavioral therapies on smoking cessation reported significantly reduced cessation among menthol smokers compared to non-menthol smokers. While results in two of these studies [97, 98] maintained a consistent direction (i.e., menthol users had reduced cessation compared to non-menthol users), they were not statistically significant across all follow-up time points; three of these studies reported significantly reduced cessation among menthol smokers at all time points assessed [99, 101, 102]. In the 2003 study by Okuyemi et al. [97], African American menthol smokers had significantly reduced 7-day point prevalence abstinence at 6 weeks (28.3% vs. 41.5%; $p = 0.006$) compared to African American non-menthol smokers, but the difference was not significant at 6 months (21.4% vs. 27.0%; $p = 0.21$). In the 2007 study of African American light smokers (≤ 10 cigarettes per day) by Okuyemi et al. [98], menthol smokers had significantly reduced 7-day point prevalence abstinence at 26 weeks (11.2% vs. 18.8%; $p = 0.015$) compared to non-menthol smokers, but not at 8 weeks (22.6% vs. 26.8%; $p = 0.291$). The 2013 study of African American light smokers by Faseru et al. [99] showed significantly reduced cotinine-verified 7-day point prevalence abstinence among menthol compared to non-menthol smokers at week 7 (14.4% vs. 28.4%; $p = 0.001$) and week 26 (10.0% vs. 20.4%; $p = 0.005$); this study also demonstrated an 84% increased odds of cessation among non-menthol compared to menthol smokers, controlling for treatment, visit attendance, cotinine level, and years smoked. In the 2014 study of treatment–seeking smokers by Rojewski et al., [101] menthol smokers showed significantly reduced 7-day point prevalence abstinence among menthol compared to non-menthol smokers at week 14 (14.8% vs. 33.3%; $p = 0.04$) and week 26 (13% vs. 30%; $p = 0.04$). In the 2014 study by Smith et al. [102], menthol smoking was associated with reduced likelihood of smoking cessation success compared to non-menthol smoking (31% vs. 38%); this study also found that among menthol smokers, African American women were at a particularly high risk of cessation failure compared to white women (17% vs. 35%; OR = 2.63, 95% CI = 1.75,3.96). One major difference in these studies is focus of the cessation intervention.

Five studies [97–99, 101, 102] testing the impact of an individual-level intervention showed reduced cessation among menthol smoking participants while the provider-focused intervention [96] showed no difference in cessation among menthol and non-menthol smoking participants. One individual-level intervention did not show a difference in cessation by menthol use, but that may be attributed to its unique population and the effect of smoking on the participants' other substance use. The studies focusing on individual-level interventions are more relevant to the question of menthol's influence on smoking cessation, as they capture a seven to eight-week window of evidence-based treatment for smoking cessation rather than a single provider visit. The five studies of African American [97–99, 102] and treatment-seeking [101] smokers provide particularly strong evidence of reduced cessation among menthol compared to non-menthol smokers in the face of extended smoking cessation treatment.

Summary - cessation

Four of five studies in the TUS-CPS [75–77, 83] and two of four studies in the Cancer Control Supplement to the National Health Interview Survey [80, 82] that examined quit attempts and additional cessation measures among adult smokers indicate that cessation is reduced in non-Hispanic whites and in racial and ethnic subgroups of menthol smokers compared to non-menthol smokers despite increased quit attempts. These findings demonstrate reasonable consistency and a coherent picture of quit behavior among menthol smokers: menthol smokers make more quit attempts than non-menthol smokers, yet have a more difficult time quitting

successfully. Five [87, 90, 91, 93, 94] of eight cohort studies and five [97–99, 101, 102] of seven randomized controlled trials contribute to the consistency of the findings and the strength of the association between menthol smoking and reduced cessation among adult smokers. Evidence from these ten studies with consistent results also support the temporal relationship between menthol smoking and reduced smoking cessation through their study designs which included longitudinal follow-up of adult smokers. One community-based cross-sectional study also indicates that female menthol smokers have reduced cessation success [68]. One study using consumer purchasing data also shows that African American menthol smokers are less likely to quit smoking [94]. Further, these findings are plausible in light of historic tobacco industry marketing of menthol cigarettes as medicinal, less harmful, or even a more healthful product than non-menthol cigarettes [103–106] and the resulting perceptions among menthol smokers that menthol cigarettes may be less risky than regular cigarettes [107]. These population-based cross-sectional, cohort, and randomized controlled studies, which showed strong and consistent associations between menthol use and reduced smoking cessation, were high quality, and addressed bias and confounding through regression adjustment or randomization.

Discussion

Studies published after 2013 bolster and augment earlier findings regarding the deleterious relationship between menthol cigarette use, youth smoking initiation, and nicotine dependence. The strength and consistency of the associations in these studies confirm the conclusions of previous studies and provide additional support for the conclusion that an FDA ban on menthol tobacco products would benefit public health.

Limitations of this review include restriction of the search to articles published in PubMed and lack of multiple independent coders which may have biased the way that studies were included and characterized. Additionally, brand names (e.g., Newport) were not included in the search strategy, which may have resulted in not capturing all relevant studies.

Studies of the cigarette marketplace confirm menthol's growing market share. The proportion of menthol variants of popular brands like Pall Mall, Camel, and Marlboro rose, at times substantially, between 2004 and 2013 [108]. Newport, the leading menthol brand, increased its market share from 7.23% in 2002 to 10.89% in 2013 [108] and has continued to grow following Reynolds American's 2015 acquisition of Lorillard Tobacco Company [109], from 13% to 13.6% in the fourth quarter of 2015 alone [110]. More recently, Newport launched new promotional efforts aimed at recruiting young adults to smoke cigarettes [111].

Analyses of the NSDUH highlight that among past 30-day smokers, the proportion of menthol cigarette users was 35% in 2008–2010 and increased significantly to 39% in 2012–2014 [14]. These increases were observed in young adults aged 18–25, as well as adults aged 26–34 and 35–49 and over this time period, youth smokers aged 12–17 remained the group with the highest prevalence of menthol cigarette use (54%) [14]. The findings of this review, in concert with recent evidence on the increasing presence of menthol in the cigarette market, underscores the urgent need for policy action to ban the sale, marketing, or presence of menthol as a characterizing flavor in cigarettes at the national, state, and local levels.

Conclusions

This review of the scientific evidence demonstrates that there is more than sufficient evidence to establish a positive relationship between menthol cigarettes and (1) increased youth smoking initiation, (2) increased nicotine dependence, and (3) decreased adult cessation. The weight of the evidence from studies published through 2017 supports that removal of menthol from cigarettes would, in the words of the Tobacco Control Act, decrease the likelihood that those who do not use tobacco products will start using such products and increase the likelihood that existing users of tobacco products will stop using such products.

Additional files

Additional file 1: Table S1. Characteristics of included studies on menthol cigarettes and smoking initiation. Table including Reference, Study Design, Setting, Study Population, Sample Size, and Outcomes (DOCX 67 kb)

Additional file 2: Table S2. Characteristics of included studies on menthol cigarettes and nicotine dependence. Table including Reference, Study Design, Setting, Study Population, Sample Size, and Outcomes (DOCX 33 kb)

Additional file 3: Table S3. Characteristics of included studies on menthol cigarettes and smoking cessation. Table including Reference, Study Design, Setting, Study Population, Sample Size, and Outcomes (DOCX 57 kb)

Abbreviations

FDA: Food and Drug Administration; MTF: Monitoring the Future; NHANES: National Health and Nutrition Examination Survey; NHIS: National Health Interview Survey; NSDUH: National Survey on Drug Use and Health; NYSCS: National Youth Smoking Cessation Survey; NYTS: National Youth Tobacco Survey; PATH: Population Assessment of Tobacco and Health; TPSAC: Tobacco Product Scientific Advisory Committee; TUS-CPS: Tobacco Use Supplement to the Current Population Survey

Acknowledgements

The authors thank Ellen J. Vargyas, JD for her feedback on an earlier draft of this manuscript.

Funding
Funding for this review was provided by Truth Initiative. AV was supported by in part by Truth Initiative, the Tobacco Centers of Regulatory Science (TCORS) award P50DA036114 from the National Institute on Drug Abuse and Food and Drug Administration (FDA), and the Centers of Biomedical Research Excellence P20GM103644 award from the National Institute on General Medical Sciences. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health or the Food and Drug Administration. The funders had no role in the design of the study, data collection, analysis, interpretation of data, or writing the manuscript.

Availability of data and materials
All data generated or analysed during this study are included in this published article and its Additional files.

Authors' contributions
AV conceptualized the review, conducted the initial search of the literature, and drafted the manuscript. AV and LC conducted additional searches of the literature and updated the manuscript. SG, RN, and DA provided guidance throughout the process and critical revisions on the manuscript drafts. All authors read and approved the final manuscript.

Ethics approval and consent to participate
Not applicable

Consent for publication
Not applicable

Competing interests
The authors declare that they have no competing interests.

Publisher's Note

Author details
[1]The Schroeder Institute for Tobacco Research and Policy Studies at Truth Initiative, Washington, DC, USA. [2]Vermont Center on Behavior and Health, Department of Psychiatry, University of Vermont, Burlington, VT, USA. [3]Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA. [4]Department of Oncology, Georgetown University Medical Center, Lombardi Comprehensive Cancer Center, Washington, DC, USA. [5]Public Policy, Truth Initiative, Washington, DC, USA.

Received: 21 June 2017 Accepted: 10 December 2017
Published online: 29 December 2017

References

1. True W. Characterization of Menthol. In. Gaithersburg: PowerPoint slides presented at the meeting of the FDA Tobacco Products Scientific Advisory Committee; 2010.
2. Ogden M. Characterization of Menthol: History and Design of Menthol Cigarettes. In. Gaithersburg: PowerPoint slides presented at the meeting of the FDA Tobacco Products Scientific Advisory Committee; 2010.
3. Federal Trade Commission. Federal Trade Commission Cigarette Report for 2014. Washington, DC: US Federal Trade Commission; 2016.
4. Altria Group's (MO) CEO Marty Barrington on Q4 2015 Results - Earnings Call Transcript [http://seekingalpha.com/article/3843306-altria-groups-mo-ceo-marty-barrington-q4-2015-results-earnings-call-transcript].
5. RAI Investor Day: Business update [http://s2.q4cdn.com/129460998/files/doc_presentations/2016/RAI-LONDON-2016-FINAL.pdf]
6. Fagan P, Pohkrel P, Herzog T, Pagano I, Vallone D, Trinidad DR, Sakuma KL, Sterling K, Fryer CS, Moolchan E. Comparisons of three nicotine dependence scales in a multiethnic sample of young adult menthol and non-menthol smokers. Drug Alcohol Depend. 2015;149:203–11.
7. Inaba Y, Uchiyama S, Kunugita N. The need for tobacco control in Japan based on articles 9 and 10 of the World Health Organization framework convention on tobacco control (WHO FCTC), regulation of the contents of tobacco products, and regulation of tobacco product disclosures. Nihon Eiseigaku Zasshi. 2015;70(1):15–23.
8. Tobacco Products Scientific Advisory Committee. In: U.S. Food and Drug Administration, editor. Menthol cigarettes and public health: review of the scientific evidence and recommendations; 2011. March 23.
9. U.S. Food and Drug Administration. Preliminary Scientific Evaluation of the Possible Public Health Effects of Menthol versus Nonmenthol Cigarettes. Silver Spring, MD: Center for Tobacco Products, Food and Drug Administration; 2013.
10. Caruso RV, O'Connor RJ, Travers MJ, Delnevo CD, Stephens WE. Design Characteristics and Tobacco Metal Concentrations in Filtered Cigars. Nicotine Tob Res. 2015;17(11):1331–6.
11. Bibliography of LIterature on Menthol and Tobacco [http://cancercontrol.cancer.gov/brp/TCRB/documents/menthol_bibliography_508.pdf].
12. U.S. Food and Drug Administration. Reference addendum: preliminary scientific evaluation of the possible public health effects of menthol versus nonmenthol cigarettes. Silver Spring, MD: Center for Tobacco Products, Food and Drug Administration; 2013.
13. Giovino GA, Villanti AC, Mowery PD, Sevilimedu V, Niaura RS, Vallone DM, Abrams DB. Differential trends in cigarette smoking in the USA: is menthol slowing progress? Tob Control. 2015;24(1):28–37.
14. Villanti AC, Mowery PD, Delnevo CD, Niaura RS, Abrams DB, Giovino GA. Changes in the prevalence and correlates of menthol cigarette use in the USA, 2004–2014. Tob Control. 2016;25(Suppl 2):ii14–20.
15. Villanti AC, Johnson AL, Ambrose BK, et al. Flavored Tobacco Product Use in Youth and Adults: Findings From the First Wave of the PATH Study (2013–2014). Am J Prev Med. 2017;53(2):139–51.
16. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. The NSDUH Report. Use of Menthol Cigarettes. Rockville; 2009.
17. Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. The NSDUH Report: Recent Trends in Menthol Cigarette Use. Rockville; 2011.
18. Rock VJ, Davis SP, Thorne SL, Asman KJ, Caraballo RS. Menthol cigarette use among racial and ethnic groups in the United States, 2004-2008. Nicotine Tob Res. 2010;12(Suppl 2):S117–24.
19. Caraballo RS, Asman K. Epidemiology of menthol cigarette use in the United States. Tob Induc Dis. 2011;9(Suppl 1):S1.
20. Moolchan ET. Adolescent menthol smokers: will they be a harder target for cessation? Nicotine Tob Res. 2004;6(Suppl 1):S93–5.
21. Minaker LM, Ahmed R, Hammond D, Manske S. Flavored tobacco use among Canadian students in grades 9 through 12: prevalence and patterns from the 2010-2011 youth smoking survey. Prev Chronic Dis. 2014;11:E102.
22. Soulakova JN, Danczak RR: Impact of Menthol Smoking on Nicotine Dependence for Diverse Racial/Ethnic Groups of Daily Smokers. Healthcare (Basel, Switzerland) 2017, 5(1).
23. Farrelly MC, Faulkner DL, Mowery P. Legacy first look report 1. Cigarette smoking among youth: results from the 1999 National Youth Tobacco Survey. Washington, DC: American Legacy Foundation; 2000.
24. Farrelly MC, Vilsaint M-C, Lindsey D, Kristin Y, Messeri P. Legacy first look report 7. Cigarettte smoking among youth: results from the 2000 National Youth Tobacco Survey. In. Washington, DC: American Legacy Foundation; 2001.
25. Vilsaint MC, Green M, Xiao J. Legacy first look report 13. Cigarette smoking among youth: results from the 2002 National Youth Tobacco Survey. In. Washington, DC: American Legacy Foundation; 2004.
26. Appleyard J, Messeri P, Haviland ML. Smoking among Asian American and Hawaiian/Pacific islander youth: data from the 2000 National Youth Tobacco Survey. Asian Am Pac Isl J Health. 2001;9(1):5–14.
27. Yu M. Tobacco use among American Indian or Alaska native middle- and high-school students in the United States. Nicotine Tob Res. 2011;13(3):173–81.
28. Hersey JC, Nonnemaker JM, Homsi G. Menthol cigarettes contribute to the appeal and addiction potential of smoking for youth. Nicotine Tob Res. 2010;12(Suppl 2):S136–46.
29. Centers for Disease Control and Prevention. Cigarette brand preference among middle and high school students who are established smokers—United States, 2004 and 2006. MMWR Morb Mortal Wkly Rep. 2009;58(05):112–55.
30. Curtin GM, Sulsky SI, Van Landingham C, Marano KM, Graves MJ, Ogden MW, Swauger JE. Patterns of menthol cigarette use among current smokers,

overall and within demographic strata, based on data from four U.S. government surveys. Regul Toxicol Pharmacol. 2014;70(1):189–96.
31. Fallin A, Goodin AJ, King BA. Menthol cigarette smoking among lesbian, gay, bisexual, and transgender adults. Am J Prev Med. 2015;48(1):93–7.
32. Hickman NJ 3rd, Delucchi KL, Prochaska JJ. Menthol use among smokers with psychological distress: findings from the 2008 and 2009 National Survey on drug use and health. Tob Control. 2014;23(1):7–13.
33. Rath JM, Villanti AC, Williams VF, Richardson A, Pearson JL, Vallone DM. Correlates of current menthol cigarette and flavored other tobacco product use among U.S. young adults. Addict Behav. 2016;62:35–41.
34. Hersey JC, Ng SW, Nonnemaker JM, Mowery P, Thomas KY, Vilsaint MC, Allen JA, Haviland ML. Are menthol cigarettes a starter product for youth? Nicotine Tob Res. 2006;8(3):403–13.
35. Muilenburg JL, Legge JS Jr. African American adolescents and menthol cigarettes: smoking behavior among secondary school students. J Adolesc Health. 2008;43(6):570–5.
36. Nonnemaker J, Hersey J, Homsi G, Busey A, Allen J, Vallone D. Initiation with menthol cigarettes and youth smoking uptake. Addiction. 2013;108(1):171–8.
37. Dauphinee AL, Doxey JR, Schleicher NC, Fortmann SP, Henriksen L. Racial differences in cigarette brand recognition and impact on youth smoking. BMC Public Health. 2013;13:170.
38. Azagba S, Minaker LM, Sharaf MF, Hammond D, Manske S. Smoking intensity and intent to continue smoking among menthol and non-menthol adolescent smokers in Canada. Cancer Causes Control. 2014;25(9):1093–9.
39. Delnevo CD, Villanti AC, Wackowski OA, Gundersen DA, Giovenco DP. The influence of menthol, e-cigarettes and other tobacco products on young adults' self-reported changes in past year smoking. Tob Control. 2016;25(5):571–4.
40. Curtin GM, Sulsky SI, Van Landingham C, Marano KM, Graves MJ, Ogden MW, Swauger JE. Measures of initiation and progression to increased smoking among current menthol compared to non-menthol cigarette smokers based on data from four U.S. government surveys. Regul Toxicol Pharmacol. 2014;70(2):446–56.
41. Villanti AC, Giovino GA, Barker DC, Mowery PD, Sevilimedu V, Abrams DB. Menthol brand switching among adolescents and young adults in the National Youth Smoking Cessation Survey. Am J Public Health. 2012;102(7):1310–2.
42. Rath JM, Villanti AC, Williams VF, Richardson A, Pearson JL, Vallone DM. Patterns of longitudinal transitions in menthol use among U.S. young adult smokers. Nicotine Tob Res. 2015;17(7):839–46.
43. Foulds J, Hooper MW, Pletcher MJ, Okuyemi KS. Do smokers of menthol cigarettes find it harder to quit smoking? Nicotine Tob Res. 2010;12(Suppl 2):S102–9.
44. Roberts ME, Doogan NJ, Kurti AN, Redner R, Gaalema DE, Stanton CA, White TJ, Higgins ST. Rural tobacco use across the United States: how rural and urban areas differ, broken down by census regions and divisions. Health Place. 2016;39:153–9.
45. Sterling K, Berg CJ, Thomas AN, Glantz SA, Ahluwalia JS. Factors associated with small cigar use among college students. Am J Health Behav. 2013;37(3):325–33.
46. Villanti AC, Richardson A, Vallone DM, Rath JM. Flavored tobacco product use among U.S. young adults. Am J Prev Med. 2013;44(4):388–91.
47. Azagba S, Sharaf MF. Binge drinking and marijuana use among menthol and non-menthol adolescent smokers: findings from the youth smoking survey. Addict Behav. 2014;39(3):740–3.
48. Kong G, Singh N, Camenga D, Cavallo D, Krishnan-Sarin S. Menthol cigarette and marijuana use among adolescents. Nicotine Tob Res. 2013;15(12):2094–9.
49. Schauer GL, Peters EN, Rosenberry Z, Kim H. Trends in and characteristics of marijuana and menthol cigarette use among current cigarette smokers, 2005–2014. Nicotine Tob Res. 2017. doi:10.1093/ntr/ntw394.
50. KOOL isn't getting the starters. Brown & Williamson Tobacco Corporation. Bates No. 621079918–9921 [https://www.industrydocumentslibrary.ucsf.edu/tobacco/docs/#id=mnbd0132].
51. Achey TL. Product Information, Lorillard. 1978. (Bates No. 94671153/1154). https://www.industrydocumentslibrary.ucsf.edu/tobacco/docs/#id=mjnh0055. Accessed 18 Dec 2017.
52. Klausner K. Menthol cigarettes and smoking initiation: a tobacco industry perspective. Tob Control. 2011;20(Suppl 2):ii12–9.
53. Yerger VB. Menthol's potential effects on nicotine dependence: a tobacco industry perspective. Tob Control. 2011;20(Suppl 2):ii29–36.
54. Kreslake JM, Wayne GF, Alpert HR, Koh HK, Connolly GN. Tobacco industry control of menthol in cigarettes and targeting of adolescents and young adults. Am J Public Health. 2008;98(9):1685–92.
55. Adelman D, Grainger M, Ayala V, Paxton K. Menthol regulatory refresh; activity likely to increase. New York, NY: Morgan Stanley & Co. LLC; 2012.
56. Osaki Y, Tanihata T, Ohida T, Minowa M, Wada K, Suzuki K, Kaetsu A, Okamoto M, Kishimoto T. Adolescent smoking behaviour and cigarette brand preference in Japan. Tob Control. 2006;15(3):172–80.
57. Connolly GN, Behm I, Osaki Y, Wayne GF. The impact of menthol cigarettes on smoking initiation among non-smoking young females in Japan. Int J Environ Res Public Health. 2011;8(1):1–14.
58. Agaku IT, Omaduvie UT, Filippidis FT, Vardavas CI. Cigarette design and marketing features are associated with increased smoking susceptibility and perception of reduced harm among smokers in 27 EU countries. Tob Control. 2015;24(e4):e233–240.
59. Brennan E, Gibson L, Momjian A, Hornik RC. Are young people's beliefs about menthol cigarettes associated with smoking-related intentions and behaviors? Nicotine Tob Res. 2015;17(1):81–90.
60. Collins CC, Moolchan ET. Shorter time to first cigarette of the day in menthol adolescent cigarette smokers. Addict Behav. 2006;31(8):1460–4.
61. DiFranza JR, Savageau JA, Fletcher K, Ockene JK, Rigotti NA, McNeill AD, Coleman M, Wood C. Recollections and repercussions of the first inhaled cigarette. Addict Behav. 2004;29(2):261–72.
62. Wackowski O, Delnevo CD. Menthol cigarettes and indicators of tobacco dependence among adolescents. Addict Behav. 2007;32(9):1964–9.
63. Li J, Paynter J, Arroll B. A cross-sectional study of menthol cigarette preference by 14- to 15-year-old smokers in New Zealand. Nicotine Tob Res. 2012;14(7):857–63.
64. Curtin GM, Sulsky SI, Van Landingham C, Marano KM, Graves MJ, Ogden MW, Swauger JE. Primary measures of dependence among menthol compared to non-menthol cigarette smokers in the United States. Regul Toxicol Pharmacol. 2014;69(3):451–66.
65. Baker TB, Piper ME, McCarthy DE, Bolt DM, Smith SS, Kim SY, Colby S, Conti D, Giovino GA, Hatsukami D, et al. Time to first cigarette in the morning as an index of ability to quit smoking: implications for nicotine dependence. Nicotine Tob Res. 2007;9(Suppl 4):S555–70.
66. Ahijevych K, Parsley LA. Smoke constituent exposure and stage of change in black and white women cigarette smokers. Addict Behav. 1999;24(1):115–20.
67. Muscat JE, Liu HP, Stellman SD, Richie JP Jr. Menthol smoking in relation to time to first cigarette and cotinine: results from a community-based study. Regul Toxicol Pharmacol. 2012;63(1):166–70.
68. Rosenbloom J, Rees VW, Reid K, Wong J, Kinnunen T. A cross-sectional study on tobacco use and dependence among women: does menthol matter? Tob Induc Dis. 2012;10(1):19.
69. Kasza KA, Hyland AJ, Bansal-Travers M, Vogl LM, Chen J, Evans SE, Fong GT, Cummings KM, O'Connor RJ. Switching between menthol and nonmenthol cigarettes: findings from the u.S. cohort of the international tobacco control four country survey. Nicotine Tob Res. 2014;16(9):1255–65.
70. Frost-Pineda K, Muhammad-Kah R, Rimmer L, Liang Q. Predictors, indicators, and validated measures of dependence in menthol smokers. J Addict Dis. 2014;33(2):94–113.
71. Anderson SJ. Marketing of menthol cigarettes and consumer perceptions: a review of tobacco industry documents. Tob Control. 2011;20(Suppl 2):ii20–8.
72. Alexander LA, Crawford T, Mendiondo MS. Occupational status, work-site cessation programs and policies and menthol smoking on quitting behaviors of US smokers. Addiction. 2010;105(Suppl 1):95–104.
73. Fagan P, Augustson E, Backinger CL, O'Connell ME, Vollinger RE Jr, Kaufman A, Gibson JT. Quit attempts and intention to quit cigarette smoking among young adults in the United States. Am J Public Health. 2007;97(8):1412–20.
74. Kahende JW, Malarcher AM, Teplinskaya A, Asman KJ. Quit attempt correlates among smokers by race/ethnicity. Int J Environ Res Public Health. 2011;8(10):3871–88.
75. Levy DT, Blackman K, Tauras J, Chaloupka FJ, Villanti AC, Niaura RS, Vallone DM, Abrams DB. Quit attempts and quit rates among menthol and nonmenthol smokers in the United States. Am J Public Health. 2011;101(7):1241–7.
76. Delnevo CD, Gundersen DA, Hrywna M, Echeverria SE, Steinberg MB. Smoking-cessation prevalence among U.S. smokers of menthol versus non-menthol cigarettes. Am J Prev Med. 2011;41(4):357–65.

77. Trinidad DR, Perez-Stable EJ, Messer K, White MM, Pierce JP. Menthol cigarettes and smoking cessation among racial/ethnic groups in the United States. Addiction. 2010;105(Suppl 1):84–94.
78. Fagan P, Moolchan ET, Hart A Jr, Rose A, Lawrence D, Shavers VL, Gibson JT. Nicotine dependence and quitting behaviors among menthol and non-menthol smokers with similar consumptive patterns. Addiction. 2010; 105(Suppl 1):55–74.
79. Keeler C, Max W, Yerger V, Yao T, Ong MK, Sung HY. The Association of Menthol Cigarette Use With Quit Attempts, Successful Cessation, and Intention to Quit Across Racial/Ethnic Groups in the United States. Nicotine Tob Res. 2017;19(12):1450–64.
80. Stahre M, Okuyemi KS, Joseph AM, Fu SS. Racial/ethnic differences in menthol cigarette smoking, population quit ratios and utilization of evidence-based tobacco cessation treatments. Addiction. 2010;105(Suppl 1): 75–83.
81. Cubbin C, Soobader MJ, LeClere FB. The intersection of gender and race/ethnicity in smoking behaviors among menthol and non-menthol smokers in the United States. Addiction. 2010;105(Suppl 1):32–8.
82. Gundersen DA, Delnevo CD, Wackowski O. Exploring the relationship between race/ethnicity, menthol smoking, and cessation, in a nationally representative sample of adults. Prev Med. 2009;49(6):553–7.
83. Sulsky SI, Fuller WG, Van Landingham C, Ogden MW, Swauger JE, Curtin GM. Evaluating the association between menthol cigarette use and the likelihood of being a former versus current smoker. Regul Toxicol Pharmacol. 2014;70(1):231–41.
84. Muscat JE, Richie JP Jr, Stellman SD. Mentholated cigarettes and smoking habits in whites and blacks. Tob Control. 2002;11(4):368–71.
85. Okuyemi KS, Ebersole-Robinson M, Nazir N, Ahluwalia JS. African-American menthol and nonmenthol smokers: differences in smoking and cessation experiences. J Natl Med Assoc. 2004;96(9):1208–11.
86. Reitzel LR, Etzel CJ, Cao Y, Okuyemi KS, Ahluwalia JS. Associations of menthol use with motivation and confidence to quit smoking. Am J Health Behav. 2013;37(5):629–34.
87. Reitzel LR, Nguyen N, Cao Y, Vidrine JI, Daza P, Mullen PD, Velasquez MM, Li Y, Cinciripini PM, Cofta-Woerpel L, et al. Race/ethnicity moderates the effect of prepartum menthol cigarette use on postpartum smoking abstinence. Nicotine Tob Res. 2011;13(12):1305–10.
88. D'Silva J, Boyle RG, Lien R, Rode P, Okuyemi KS. Cessation outcomes among treatment-seeking menthol and nonmenthol smokers. Am J Prev Med. 2012;43(5 Suppl 3):S242–8.
89. Hyland A, Garten S, Giovino GA, Cummings KM. Mentholated cigarettes and smoking cessation: findings from COMMIT. Community intervention trial for smoking cessation. Tob Control. 2002;11(2):135–9.
90. Pletcher MJ, Hulley BJ, Houston T, Kiefe CI, Benowitz N, Sidney S. Menthol cigarettes, smoking cessation, atherosclerosis, and pulmonary function: the coronary artery risk development in young adults (CARDIA) study. Arch Intern Med. 2006;166(17):1915–22.
91. Gandhi KK, Foulds J, Steinberg MB, Lu SE, Williams JM. Lower quit rates among African American and Latino menthol cigarette smokers at a tobacco treatment clinic. Int J Clin Pract. 2009;63(3):360–7.
92. Blot WJ, Cohen SS, Aldrich M, McLaughlin JK, Hargreaves MK, Signorello LB. Lung cancer risk among smokers of menthol cigarettes. J Natl Cancer Inst. 2011;103(10):810–6.
93. Reitzel LR, Li Y, Stewart DW, Cao Y, Wetter DW, Waters AJ, Vidrine JI. Race moderates the effect of menthol cigarette use on short-term smoking abstinence. Nicotine Tob Res. 2013;15(5):883–9.
94. Lewis M, Wang Y, Berg CJ. Tobacco control environment in the United States and individual consumer characteristics in relation to continued smoking: differential responses among menthol smokers? Prev Med. 2014; 65:47–51.
95. Celebucki CC, Wayne GF, Connolly GN, Pankow JF, Chang EI. Characterization of measured menthol in 48 U.S. cigarette sub-brands. Nicotine Tob Res. 2005;7(4):523–31.
96. Fu SS, Okuyemi KS, Partin MR, Ahluwalia JS, Nelson DB, Clothier BA, Joseph AM. Menthol cigarettes and smoking cessation during an aided quit attempt. Nicotine Tob Res. 2008;10(3):457–62.
97. Okuyemi KS, Ahluwalia JS, Ebersole-Robinson M, Catley D, Mayo MS, Resnicow K. Does menthol attenuate the effect of bupropion among African American smokers? Addiction. 2003;98(10):1387–93.
98. Okuyemi KS, Faseru B, Sanderson Cox L, Bronars CA, Ahluwalia JS. Relationship between menthol cigarettes and smoking cessation among African American light smokers. Addiction. 2007;102(12):1979–86.
99. Faseru B, Nollen NL, Mayo MS, Krebill R, Choi WS, Benowitz NL, Tyndale RF, Okuyemi KS, Ahluwalia JS, Sanderson Cox L. Predictors of cessation in African American light smokers enrolled in a bupropion clinical trial. Addict Behav. 2013;38(3):1796–803.
100. Winhusen TM, Adinoff B, Lewis DF, Brigham GS, Gardin JG 2nd, Sonne SC, Theobald J, Ghitza U. A tale of two stimulants: mentholated cigarettes may play a role in cocaine, but not methamphetamine, dependence. Drug Alcohol Depend. 2013;133(3):845–51.
101. Rojewski AM, Toll BA, O'Malley SS. Menthol cigarette use predicts treatment outcomes of weight-concerned smokers. Nicotine Tob Res. 2014;16(1):115–9.
102. Smith SS, Fiore MC, Baker TB. Smoking cessation in smokers who smoke menthol and non-menthol cigarettes. Addiction. 2014;109(12):2107–17.
103. Gardiner PS. The African Americanization of menthol cigarette use in the United States. Nicotine Tob Res. 2004;6(Suppl 1):S55–65.
104. Sutton CD, Robinson RG. The marketing of menthol cigarettes in the United States: populations, messages, and channels. Nicotine Tob Res. 2004;6(Suppl 1):S83–91.
105. Brown & Williamson: File note. Kool advertising 480000 to 680000. 1968.
106. Market Science Associates Inc.: The growth of menthols, 1933–1977. 1978.
107. Wackowski OA, Delnevo CD, Lewis MJ. Risk perceptions of menthol cigarettes compared with nonmenthol cigarettes among New Jersey adults. Nicotine Tob Res. 2010;12(7):786–90.
108. Sharma A, Fix BV, Delnevo C, Cummings KM, O'Connor RJ. Trends in market share of leading cigarette brands in the USA: national survey on drug use and health 2002-2013. BMJ Open. 2016;6(1):e008813.
109. Reynolds American. Press release: Reynolds American completes acquisition of Lorillard and related divestitures; 2015. http://www.reynoldsamerican.com/about-us/press-releases/Press-Release-Details-/2015/Reynolds-American-completes-acquisition-of-Lorillard-and-related-divestitures/default.aspx. Accessed 18 Dec 2017.
110. Mickle T. Reynolds American results surge, driven by Newport brand. In: The wall street journal; 2016.
111. Mickle T, Valentino-DeVries J. Newport's 'pleasure lounge' aims to ignite cigarettes sales. In: The wall street journal; 2016.

Appendix F

truth initiative
INSPIRING TOBACCO-FREE LIVES

Examining Perceptions about iQOS Heat Not Burn Product: Consumer Studies in Japan and Switzerland

RESEARCH CONDUCTED BY FLAMINGO GROUP FOR TRUTH INITIATIVE

JENNIFER CANTRELL | EVALUATION SCIENCE & RESEARCH | OCTOBER 2016

what is iQOS?

- Developed by Philip Morris
- Battery-powered, pen-like device delivers nicotine by heating tobacco instead of burning it.
- User inserts a tube of tobacco that looks like half a cigarette (called a HeatStick) into the heating device
- A metal blade heats the tobacco to a maximum of 660° F, providing a dozen or so puffs.
- Taste ~ traditional cigarette, sticks smell like tobacco, though less odor
- About 20 HeatSticks can be used per charge.

research rationale

- Phillip Morris has submitted a modified risk tobacco product application to the FDA to have iQOS approved as a reduced harm tobacco product
- Currently being test-marketed in Japan and Switzerland
- Examine consumer perceptions, attitudes and behavior as well as marketing strategies

two-phased study

phase 1: contextual study

- Gathered info. on the current debates in smoking technologies and youth culture; examined how iQOS marketing fit into those narratives

phase 2: consumer study

- 6 focus groups with iQOS consumers in Japan (age 20-39) & Switzerland (age 19-44)
- Participants included smokers who were:
  - Full iQOS converters, partial converters (dual users), those who have tried but rejected iQOS and those who were only aware of iQOS

youth culture & technology: freedom & control

FREEDOM	CONTROL
• Freedom of speech ➞ social media / political activism • Many selves / Experimentation • Creativity	• “On demand” culture • Control over your body
• Pursuing emotional desires • Fitting in with friends • Standing out from the crowd • Setting yourself apart from your parents’ world	• Health and fitness consciousness; understanding processes behind goods consumed

Some young people fit more comfortably in one space than the other, but behaviors are shifting in both directions

marketing iQOS

FOCUS ON HIGH MARKETING SPEND AND BRAND EXPERIENCE ACROSS MARKETS

Point-of-Sale

- **Design, approach and core benefits as key motivations**
- Dedicated iQOS embassies in Japan – clean, minimalist environment
- Sales pitches heavily trial-focused
- Staff well-trained, talking to consumers for as much as an hour about the device, presented in sleek, iPhone-style packaging
- Focus on core benefits of no ash, limited smoke, and smell
- Rigorous registration process (ID required)

EVENTS

- Glamorous launch parties across markets (galas, dinner, open bar, free HeatSticks, discounted devices)
- Brand ambassadors organizing Philip Morris-funded parties
- Sponsoring Japanese talk show aimed at a young adult audience

branding iQOS

THE IQOS BRAND FOCUSES ON SEVERAL AREAS THAT APPEAL TO THE **MODERNIZATION OF TRADITIONAL SMOKING**

Control

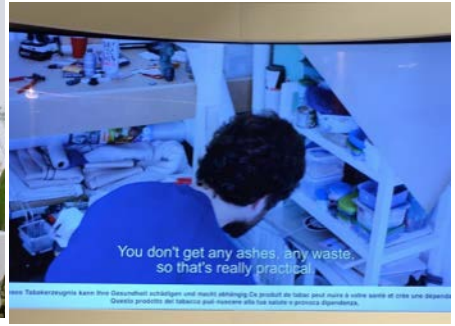
- Clinical purity
- Closed system
- Premium design
- Stabilizing / control

Freedom

- Sensory invitations
- Nostalgia for traditional smoking
- Familiarity

control themes differentiate iQOS from traditional cigarettes

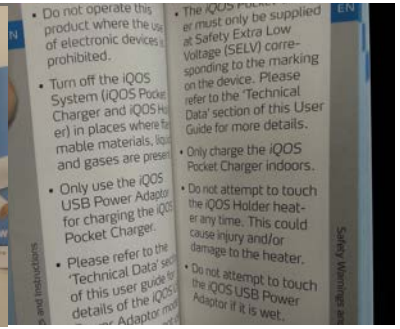
Clinical purity



Closed system

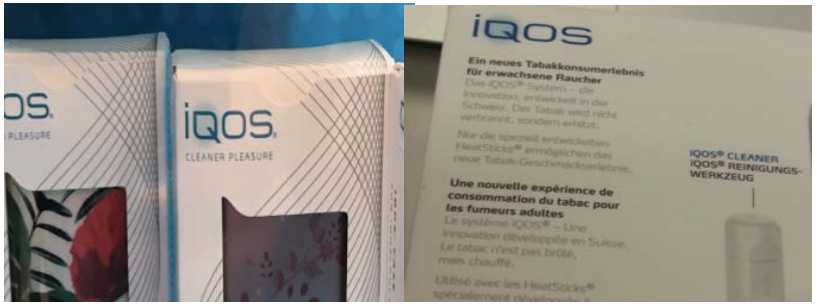
Premium

Stability & control



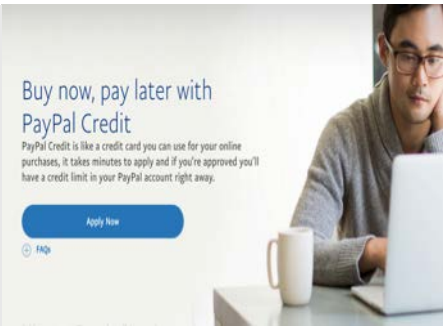
freedom themes align iQOS with traditional cigarettes

Nostalgia



Sensory cues & language

Familiarity



Re-normalizing smoking

iQOS advertising attempts to re-normalize smoking with an “evolved” modern cigarette

cultural values, smoking & iQOS

CONTROL	FREEDOM
• Clean, chic device, pack and in-store environment borrowing from Apple • Core proposition anchored in cleanliness & health	• iQOS lacks the intensity of regular smoking • Impracticalities render act of smoking cumbersome, rather than intuitive
Cultural values of control resonates in Japan: order, cleanliness, & respect for others iQOS feels like a good cultural fit	Core smoking remains rooted in a freedom narrative: esp. in Switzerland, barriers to conversion seem rooted in the freedom value

the Japanese iQOS user experience

- Reserved for socializing with groups of non-smokers, where use of regular cigarettes would be to impose on the social dynamic

- Used where smoking regular cigarettes would damage the space (yellowing walls, ash in car)

- Used where you have the luxury of space (enough room to take charger, stick and HeatSticks, in car where it can be left permanently on charge)

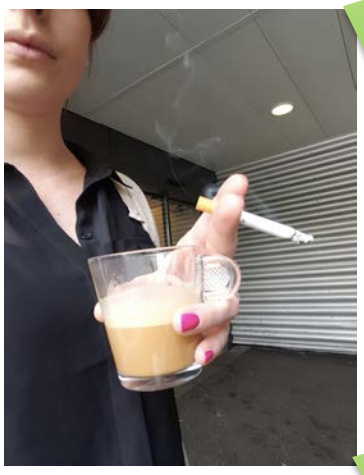
I like smoking iQOS while watching the TV with my family at home. iQOS is the best for smoking in the house because it creates no ash.

-Nagoya, 25-29

the Swiss iQOS experience

- Fails to deliver on intensity of regular smoking, which gives people a feeling of “freedom”

- Difficult to tolerate mild taste and reduced sensory cues compared to more intense smoking moments:
  - Inhalation moment connected to strong emotions: stress relief, relaxation, indulgence - ultimately “being in the moment”: not something to dilute!



There’s just something about that after work drink, I need a proper cigarette with it. Same with coffee, cigarettes just “go” with coffee.
Zurich, 26-44

This cigarette has become a robot. They need to put the cowboy back in the cigarette.
Lausanne, 26-44

consumer perceptions

- Even those unimpressed by descriptions of the device were *seduced and beguiled* by the pack presentation
- Appearance of device in itself is slick, blends in well with existing tech devices
- Core value proposition
  - Easily connected to **lack of ash, reduced smell**, but some still **fail** to connect to **potential health benefits**

benefits of iQOS use

DESIGN, APPROACH AND CORE BENEFITS AS MAJOR MOTIVATION

Feel, sensation

- Gentler feel on throat (normal cigarette feels harsh by comparison)

Appearance

- Chic packaging has tech appeal
- Embassies offer clean, minimalist environment

Cleanliness

- No ash, smoke or smell due to heat not burn technology
- Can smoke indoors

Health Benefits

- Belief that it will be better for those around me
- Belief that I need to protect my health
- Possible quitting aid

Social Benefits

- Socially friendly: “smoke is invisible”
- Smoking does not encroach on or disrespect others

barriers to iQOS use

ON A FUNCTIONAL LEVEL, IQOS STILL FEELS UNFAMILIAR AND COMPLICATED TO USE ACROSS BOTH MARKETS

Taste, smell

- Strange, unpleasant
- Smell compared to “burning corn” in Japan

Appearance

- Unfamiliar
- Draws attention to user

High Maintenance

- Battery charge doesn’t last full day
- Requires cleaning

Expensive

- Device itself very costly
- Heatsticks as expensive as regular cigarettes and last less long

Cumbersome

- Cannot be held like a regular cigarette
- Fragile: breaks easily

implications for US market

- Remains to be seen

- Barriers
  - High price point (unaffordable for most teenagers)
  - Formal registration (passport required upon purchase)
  - Doesn’t align with smoking or vape culture in US – which aligns more with freedom narrative

- Areas for concern
  - Appeal to young adult smokers
  - May facilitate dual-use behavior

- Will monitor MRTP application to FDA

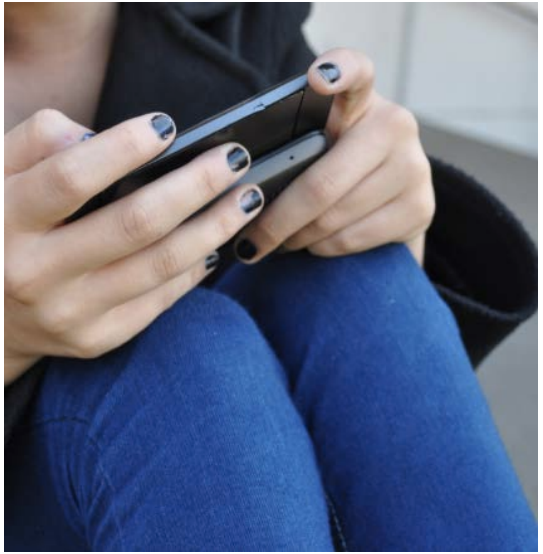
Appendix

technology defines this generation

Younger generation perceives technology to:

- make life faster, more convenient, but above all **they value its role as emotional facilitator:**
  - Keep in touch with friends & family;
  - Maximizes freedom, security, flexibility; and
  - Connects them to something larger than themselves.

Older people (30-40) **primarily laud technology's functional capabilities.**



Japan and Switzerland test markets

JAPAN	SWITZERLAND
• Been in market for over a year, more established • Some aware of health credentials / potential as quitting device • Full converters have had chance to completely alter usage rituals	• New to market in August 2015, many only recently made aware of product • No concrete understanding of iQOS health credentials, only speculation • Even full converters still in period of transition
	

Current understanding of “heat not burn” proposition

- Key information retained by most who have spoken (even briefly) to demonstrators at POS or in-store
- Easily connected to **lack of ash, reduced smell**, but some still **fail** to connect to **potential health benefits**
- For Japanese consumers, these functional benefits ladder up to higher emotional benefits around **sociability, integration** and **respect for others**

remind you of anything?


VULCANS
iQOS専用設計
レザー アイコス ケース Bタイプ


iQOS
DecorationShop ARIETE


DecorationShop ARIETE


iQOS
DecorationShop ARIETE

In summary, the majority of trial / purchase triggers throughout consumer journey speak to control / cleanliness / ordered tech

Initial triggers to trial	Triggers to purchase post-trial	Triggers to full conversion
No ash, smoke or smell due to heat not burn technology	Can smoke indoors	Accustomed to lack of ash, smoke, smell
Chic packaging has tech appeal	Feels less harsh on throat	Accustomed to gentler feel on throat
Marketing events increase desirability	Exposed to media reports on harmful effects of passive smokin  *has relevance throughout journey	Feel less self-conscious around non-smokers (esp. own )
Product demos and clean, “Apple-store-like” embassies /POS spark intrigue	Opportunity to receive reduced-rate due to marketing offer / friend giving away	Health benefits (for older people) / feeling “guilt-free”
Socially friendly: “smoke is  ible”		
Quitting aid		

And many of the barriers to purchasing iQOS in some way impact the fluidity, intensity, and feeling of freedom that comes with smoking

Initial Barriers	Barriers to purchase post-trial	Barriers to full conversion
Expensive (device, heat-sticks)	Cannot accurately emulate taste and smell of original smoking	**Doesn't "feel" like a real cigarette, lacks intensity (inhaling, visible smoke)**
'Strange', stands out 	**Inhalation less intensely satisfying, relaxing**	Maintenance (cleaning, charging)
	No personal need for no ash / smoke / smell benefits (e.g. around smokers constantly)	**Cumbersome gesture, cannot multitask**
		Breaks easily

Overall, iQOS is currently still finding its feet

- Lots of functional issues (charging, cleaning, different taste) requiring a certain level of dedication and perseverance most applicable to those looking to reap the ‘health benefits’ of iQOS

- These issues need to be ironed out before it can strike a chord with a younger mass target, but iQOS has already planted strong emotional roots:
  - Stylish, covetable device
  - Events creating aspirational brand image

Problems lie in logistics, not in the brand’s DNA: iQOS certainly has potential and we have reason to be wary

3 key areas to watch

1. CONTROL: Key attributes of the ‘control’ (e.g. cleanliness) currently drive popularity of iQOS.
   - Resonates well in Japanese cultural context emphasizing consideration for others, and could become still more appealing when Japanese anti-smoking communication starts ‘raising the alarm’ with younger people
   - BUT this does not speak to smoking as “act of rebellion” (like vape culture): a need to keep in mind iQOS’ positioning alongside the freedom space and ‘vape culture’: will it attempt to build on or reject this trend?

2. CUSTOMIZATION: In line with this, a more tailored, customizable offering is also a potential lever for younger age group: customizable tech feels natural, familiar, fun to those who have grown up with technology

3. HEALTH: Moving forward, as society increasingly embraces the control space, there is potential for understanding around reduced health risks to increase popularity and help the brand gain trust

IF iQOS COMBINES ITS EXISTING OFFERING WITH ELEMENTS OF CUSTOMIZATION TO CROSS OVER INTO FREEDOM SPACE, IT HAS POTENTIAL TO SEEM TRENDY, APPROACHABLE IN THE EYES OF A NEW MASS YOUTH AUDIENCE

Vape culture in the US fuses technology and smoking to speak to the “freedom” space

- Rooted in creative technology, it frames e-cigarettes as an opportunity to inspire self-expression and counter-culture
- Myriad flavours of ‘e-liquids’ tap into ideas of *difference* and *experimentation* associated with creative technology
- The device is customizable, ‘hackable’, inviting a ‘mix-and-match / tailor-to-me’ approach anchored in self-expression

This ability to ‘discard the rulebook’ creates an element of risk, rebellion

Expert Emily Anne Macdonald emphasises that the vape world proudly sees itself as part of a rebellious counter-culture:

- Vapers see themselves as activists, opposed to big tobacco
- Independent vape shops market themselves as purveyors of independent, artisanal alternatives to the mainstream
- Vape technology is less police-able, making it possible to avoid control from institutions (esp. parents, schools)
- Can offer a bridge between tobacco culture and marijuana culture

Appendix G

October 13, 2017

Dr. Scott Gottlieb
Commissioner
U.S. Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993

Dear Dr. Gottlieb:

The undersigned organizations are committed to a tobacco control mission that prevents initiation of all tobacco products, promotes cessation among users, and protects all from harmful secondhand exposure. Full implementation of the Food and Drug Administration's (FDA) authority under the Family Smoking Prevention and Tobacco Control Act is critical to achieving these goals and reducing disease and death from tobacco products.

In your speech on July 28, 2017, you proposed a sweeping new regulatory agenda for tobacco products. As you have recognized, one of the most important actions you can take is to make maximum use of the FDA's authority to drive down the use of the tobacco products that contribute to the premature death of nearly one-half million Americans every year—the nation's largest preventable cause of death. We support this goal. Annual smoking-attributable healthcare costs in the U.S. amount to $170 billion, with more than 60 percent paid for with public dollars, through programs like Medicare, Medicaid, Tricare, and Veterans Affairs health benefits. As you also noted, for the first time in history, between the authority that resides in the Center for Drug Evaluation and Research (CDER) and the authority that now resides in the Center for Tobacco Products (CTP), "the entire spectrum of nicotine-delivering products is now regulated."

Today the FDA is in a unique position to regulate products containing nicotine in a comprehensive manner. We support your proposal to conduct a public process to direct the "Center for Tobacco Products to develop a comprehensive nicotine regulatory plan premised on the need to confront and alter cigarette addiction." However, a comprehensive nicotine regulatory process must also, as you recognize, be agency-wide and not be limited to the Center for Tobacco Products. CDER's goal should be to enable every tobacco user to successfully quit.

In your speech, you stated "as we move forward, I also hope that we can all see the potential benefits to addicted cigarette smokers, in a properly regulated marketplace, of products capable of delivering nicotine without having to set tobacco on fire. The prospective benefit may be even greater for the subset of current cigarette smokers who find themselves unable or unwilling to quit."

You continued "we need to make sure we strike the right balance between FDA fulfilling its vital consumer protection role while also fostering innovation when it comes to potentially less harmful forms of nicotine delivery. This becomes especially true in a world where cigarettes are no longer capable of creating or sustaining addiction."

In your speech you spoke in broad terms. It is our understanding that your approach has two major components. 1) Accelerate the reduction in the use of tobacco products that cause death and disease including, but not limited to, your proposal to cut the level of nicotine in cigarettes to minimally addictive or non-addictive levels[1] and 2) Develop a more robust strategy to assist current smokers to quit the use of tobacco products entirely and, for the subset of smokers unable or unwilling to do so in the near term, to determine whether there are less harmful nicotine products that help smokers to switch completely to those products. The two components of your plan need to proceed together with the ultimate goal of ending all tobacco use.

If our understanding of your proposal is correct, we are supportive of this two-pronged agenda, as we explain in more detail below, and we are prepared to actively work with you to support the accomplishment of these objectives in the shortest possible time.

At the same time, we believe that the significant delay you announced in enforcing the statutory requirement that newly deemed products submit applications for pre-market review undermines your efforts to reduce the death and disease caused by tobacco use, especially among youth, and actually discourages the type of market-driven innovation you seek. We urge you to reconsider that decision.

The FDA has a historic opportunity to reduce the death and disease caused by tobacco and dramatically reduce government healthcare costs. It will take strong leadership to take the needed steps to drive down the use of cigarettes (and other combusted tobacco products) rapidly. It will also take thoughtful regulation to maximize any potential contribution e-cigarettes and other nicotine products[2] may make to reduce the number of people who die from tobacco use.

1) <u>The first key to the success of your plan is for the FDA to take decisive, concrete steps, such as those enumerated below, to reduce the use of cigarettes and all other combusted tobacco products as dramatically and as rapidly as possible.</u> This needs to be FDA's highest tobacco-specific priority. It will require a multi-faceted strategy using all the many tools Congress provided to the FDA. We support the objective of reducing the level of nicotine in cigarettes to

[1] Although your July 28 remarks focused on the need to reduce the use of cigarettes due to the particular harm of combustible products, FDA should not ignore the adverse public health impact of traditional smokeless tobacco products. Thus, the agency should move forward to finalize its proposed rule to sharply reduce the level of the carcinogen NNN in smokeless tobacco. *See* 82 Fed. Reg. 8004 (January 23, 2017) and Comments of Twenty-Nine Public Health Groups on Proposed Product Standard for N-Nitrosonornicotine Level in Finished Smokeless Tobacco Products, Docket No. FDA-2016-N-2527 (July 10, 2017).

[2] We use the term "e-cigarette" in the same way it is used by the Surgeon General to refer to the diverse group of devices that allow users to inhale a nicotine aerosol. *See* Department of Health and Human Services, *E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General* (2016), at 3.

render them minimally or non-addictive, but pursuit of this goal should be a complement to, not a substitute for, both traditional tobacco control efforts and the exercise of the agency's broad authority to drive down the use of cigarettes and other tobacco products through other means.

There are a number of additional concrete steps the FDA can and should take in the short term, while it moves forward on reducing nicotine levels in cigarettes, including:

- Implementing the requirement for graphic warnings on all cigarette packs that, with the textual warnings also mandated by statute, cover at least 50% of the pack, far faster than the FDA has proposed to date.

- Prohibiting tobacco products with characterizing flavors because of their widespread appeal to youth. This issue has already been the subject of FDA examination and public comment. The evidence is clear that flavored products generally are detrimental to public health. The FDA should not start the process all over again with an Advance Notice of Proposed Rulemaking (ANPRM), but rather should move directly to a proposed rule. FDA's own Population Assessment of Tobacco and Health (PATH) study found that over 71% of cigar smokers aged 12-17 had used a flavored cigar in the past month and over 73% of those young cigar smokers said they smoked cigars "because they come in flavors I like."[3] The PATH study also found that over 85% of current e-cigarette users in that age group had used a flavored product in the past month and over 81% of those young users cited flavors as the reason for their use of the product.[4] As to flavored products, the FDA should be guided by the approach its staff proposed as part of the Deeming Rule.[5] Currently, the market is flooded with flavored e-cigarette products that appeal to youth but have not been demonstrated to help smokers quit. Products with characterizing flavors should be permitted only if the industry demonstrates, and FDA determines, that they meet the statutory public health standard. FDA must find that they do not attract youth, are not toxic or teratogenic and assist smokers to quit all tobacco products or switch completely to e-cigarettes as a pathway to quitting all tobacco products.[6]

---

[3] Ambrose, BK et al., "Flavored Tobacco Product Use Among US Youth Aged 12-17 Years, 2013-2014," *Journal of the American Medical Association*, published online October 26, 2015. Study cited by FDA at 81 Fed. Reg. at 29014.

[4] *Id.*

[5] In addressing concerns about the impact of flavored products on kids, the FDA should build on its previous work in developing the Deeming Rule. During that rulemaking, the FDA endorsed a policy of denying to flavored cigars and e-cigarettes the benefits of a compliance period for premarket review, requiring that newly deemed flavored products be taken off the market within 180 days of the May 8, 2016 publication of the Rule. Unfortunately, this policy was deleted from the rule during review by the OMB's Office of Information and Regulatory Affairs during the previous Administration. In addition, when it issued the final Deeming Rule, the agency indicated its intention to proceed with a rulemaking to prohibit characterizing flavors in cigars.

[6] As the FDA noted with respect to the Deeming Rule (in a discussion struck by OMB's Office of Information and Regulatory Affairs prior to issuance of the Final Rule), "if there were meaningful evidence that flavored ENDS actually make it more likely that smokers switch completely to ENDS, such evidence submitted as part of a PMTA

- Extend the prohibition on characterizing flavors in cigarettes to include prohibiting menthol as a characterizing flavor in cigarettes. FDA's own exhaustive study confirms that menthol as a characterizing flavor in cigarettes promotes youth initiation and increases long-term addiction to smoking. Indeed, more than half of youth smokers smoke menthol cigarettes. Young adults now smoke menthol cigarettes at higher rates than they smoke non-menthol cigarettes. Menthol is slowing the decline of cigarette smoking in the U.S. and is buoying smoking rates. If FDA is serious about cutting the use of combusted products, it must take this action.

- More effectively enforcing the prohibition on the introduction of new cigarette products that have not received an FDA marketing order. Numerous new cigarette products have been introduced with no apparent marketing order. We have written to the FDA repeatedly about the introduction of such new cigarette brands or brand variations. Such apparent violations of the statute undermine FDA's authority and frustrate its objectives.

- Continuing the FDA's mass media campaigns that target youth and other vulnerable populations to reduce the use of tobacco products.

- Adopting a nationwide tracking and tracing system to proactively address any claims the tobacco industry and its allies make that reducing nicotine levels in cigarettes will lead to a black market.

- Adopting, as you suggested, strong new regulations for Substantial Equivalence, Modified Risk Tobacco Product and Pre-Market Tobacco Product Applications to accelerate the reduction in the use of cigarettes and other combusted tobacco products and prevent the introduction of new products that are inconsistent with the statute's public health standard.

- Strongly enforcing the minimum age verification requirement for the purchase of all tobacco products, including for internet and other non face-to-face sales.

2) <u>It is critical that FDA begin Action Promptly, and Set a Firm Deadline for Completing, a Final Rule to Reduce the Levels of Nicotine in Cigarettes</u>. As you explained, if nicotine were reduced to minimally addictive levels and such a product standard were actively enforced, we could save young people who experiment with cigarettes from a lifetime of addiction to these lethal products[7] and could dramatically reduce the number of current smokers who die from

---

would help support that application, as part of the analysis of whether the marketing of the product is appropriate for the protection of public health."

[7] While reducing the nicotine content of cigarettes, the FDA must also take steps to ensure that youth do not initiate use of any tobacco products, including non-combustible products. Any tobacco product that contains nicotine is addictive and all tobacco products present risk.

tobacco use. However, this potential can be realized only if the FDA takes concrete steps to implement a nicotine standard as promptly as possible.

Recently conducted research supports the feasibility of a product standard reducing nicotine in cigarettes without unintended adverse consequences.[8] We urge the FDA to proceed promptly to issue its planned ANPRM addressing all the issues material to the development of such a product standard and to place the highest priority on doing all that is needed to put such a standard in place.

We also urge FDA to include, in this Advance Notice, consideration of a product standard reducing nicotine in all combustible tobacco products, including cigars. Although your July 28 remarks repeatedly referred to the addictiveness and toxicity of "combustible cigarettes," the science is clear that combustion of tobacco is a deadly delivery mechanism for nicotine in cigars and hookah as well.

3) <u>We agree that a comprehensive framework for nicotine reduction should be accompanied by a major new effort to assist current users to quit.</u> This will require an agency-wide effort that includes both CDER and CTP. The top priority should be for the agency to consider what actions it can take to enable more tobacco users to quit using tobacco products altogether, and for those who can't quit immediately, to switch completely to less hazardous products as a pathway to quitting all tobacco products.

For FDA to play a greater role in smoking cessation, it is vital for the FDA's CDER to take steps to address the performance of existing medicinal nicotine products and foster innovation that can help more smokers successfully use FDA-approved products to quit smoking.

In the last 50 years, the FDA has approved only three drugs (NRTs, buproprion and varenicline) as safe and effective in smoking cessation. It has approved no new medications in the last decade and it places restrictions on existing products and the use of those products that curtail their reach and efficacy. Although almost 70% of smokers want to stop smoking and more than half tried to stop within the past year, fewer than one-third who tried to stop used any FDA-approved medications and only about 7% of smokers actually stopped smoking successfully in the past year.[9] The FDA has not developed a regulatory framework that both fosters the development of high quality medications to assist America's 36 million smokers and

[8] *See, e.g.* Donny EC, et al., "Reducing the nicotine content of combusted tobacco products sold in New Zealand," *Tobacco Control* 26 e37-e42, 2017; Donny et al., "Randomized Trial of Reduced-Nicotine Standards for Cigarettes," *New Engl. J. Med* 373:1340-9, 2017; World Health Organization (WHO) Study Group on Tobacco Product Regulation (TobReg), Global Nicotine Reduction Strategy, 2015; Benowitz, Neal, et al., "Reduced nicotine content cigarettes, e-cigarettes and the cigarette end game," *Addiction* 112 6-7, 2016; U.S. v. Philip Morris, USA, Inc., 449 F. Supp. 2d 1, 309 (D.D.C. 2006).

[9] Babb, Stephen, et al.,"Quitting Smoking Among Adults, United States 2000-2015," MMWR 65(52) 1457-1464, 2017.

recognizes the urgency that is merited by the more than 480,000 avoidable deaths and billions of dollars in healthcare costs incurred per year.

Thus, a searching review of FDA's approach to nicotine-containing products regulated by CDER and tobacco products regulated by CTP should be an important component of your new comprehensive nicotine regulatory strategy. This review should address several critical policy issues and will require close coordination by CDER and CTP. Those issues include, for example: (1) ensuring that the evaluation of possible new indications or labeling changes for existing approved smoking cessation products are based on a risk/benefit analysis that uses, as the critical comparator, that the failure to use these products results in the continued use of a product that kills half of its long-term users;[10] (2) determining whether indications and labeling for existing approved smoking cessation products need to be revised to encourage greater consumer acceptance and more effective use of those products; (3) evaluating how FDA's current approaches should be revised to encourage greater innovation in the development and availability of new smoking cessation products; (4) examining, specifically, the speed with which nicotine is delivered by these products, as you suggested, as a factor in evaluating the effectiveness of those products as cessation tools; (5) implementing procedures for fast track, other accelerated approval authorities and post-market surveillance that can facilitate approval of new and effective treatments for tobacco dependence; and (6) establishing a division of responsibilities between CDER and CTP that best promotes innovation in the development of products that benefit public health.[11]

This is not the first time the need for CDER to revise how it handles tobacco cessation has been raised, but despite repeated requests, there has been little effective change. CDER has failed to take the steps necessary to motivate the industry to innovate and to produce the products to help the 36 million American smokers to stop smoking. Your proposal to reduce nicotine levels in cigarettes makes the need for more effective tobacco cessation products even more urgent. Such products will not be developed without a fundamental change from CDER and that change will occur only with decisive leadership. Your remarks suggest you are prepared to supply that leadership and we are supportive of the effort to implement an FDA-wide approach.

In addition, both CDER's and CTP's approach should be coordinated and consistent with each Center's respective statutory standards, and prioritize the goal of identifying which, if any, of those products may play a positive role in assisting smokers to quit, or switch completely as a pathway to quitting, and develop regulation of these products in a manner consistent with the public health goal of accelerating the reduction in the number of people who die from tobacco use.

4) <u>We strongly disagree with the decision to issue an ANPRM to determine if the FDA should exempt so-called premium cigars from its authority and urge you to reverse that decision</u>.

[10] While the FDA stated that it does so, in response to a Citizen Petition previously submitted by some of the undersigned organizations, the objective evidence suggests that its actions are inconsistent with that assertion.

[11] *See generally*, Comments of Campaign for Tobacco-Free Kids in Docket No. FDA-2016, Psychopharmacologic Drug Advisory Committee and Drug Safety and Risk Management Advisory Committee meeting of September 14, 2016 (August 30, 2016).

There is no need for the FDA to seek additional comments on this issue, since the agency specifically requested and received public comment in the Deeming Rule docket itself on the regulation of so-called premium cigars. In the Deeming Rule, the FDA rejected the option of exempting such cigars from its regulatory authority, finding that all cigars increase the risk of disease compared to their non-use, all cigars are potentially addictive, and all cigars produce secondhand smoke that can cause disease in nonusers.[12] The FDA also carefully considered, and rejected, the claim that patterns of use of so-called premium cigars – such as frequency of use and failure to inhale – avoid negative health effects for smokers of those cigars,[13] finding that "there are no data indicating that premium cigar users are not susceptible to [the] health risks [facing cigar smokers generally]."[14] No data developed since the Deeming Rule became final call for still another look at this issue or a contrary decision.

5) We strongly disagree with the decision to exempt cigars, e-cigarettes, hookah and pipe tobacco from statutory pre-market review requirements for several years to come. We believe this decision places our public health, including our nation's youth, at unnecessary risk, as well as depriving FDA and the public of information, currently available only to the industry, that would allow the agency to determine whether any e-cigarette products actually assist smokers in switching completely to those products, or quitting tobacco products altogether, and to establish science-based regulations to protect the public health.

The new policy you announced will allow newly-deemed products to remain on the market without FDA review for at least five years following the effective date of the Deeming Rule (cigars, hookah and pipe tobacco) or six years (e-cigarettes), despite the fact, as acknowledged by FDA, that many of those products are being marketed with fruit and candy flavors that are proving attractive to kids. Moreover, there has been no scientific demonstration that the e-cigarette products on the market benefit public health by helping smokers quit or switch completely; indeed, they are the subject of large-scale dual use. FDA's unnecessary decision to postpone the deadline for submission of product applications deprives the agency of the very information it needs to assess, in a timely fashion, whether any individual products currently on the market meet the public health standard. FDA must find that they assist smokers to quit using all tobacco products, or switch completely to less harmful products as a pathway to quitting, and they do not pose a threat to our efforts to prevent kids from becoming addicted to any tobacco products.

In addition, any possible need for promulgating additional rules does not justify allowing cigars (which, after all, are combustible products) with flavors like "Cherry Dynamite," "Wild Rush" and "Banana Smash" to avoid FDA review and remain on the market until 2021 and beyond, or e-cigarettes such as "Very Berry Slushie" or many of the other egregious flavored e-cigarette products, to remain on the market until 2022 and beyond.

[12] *See* 81 Fed. Reg. at 29020-22.

[13] *Id.* at 29024-25.

[14] *Id.* at 29020.

The FDA's decision also fails to recognize that the submission of applications for the FDA review of new products is a statutory requirement for new products to enter, or remain on, the market. Thus, FDA's decision to allow thousands of cigar, hookah, pipe tobacco and e-cigarette products to remain on the market for years without agency review raises serious legal issues.[15]

Finally, in your July 28 remarks, you stated that delayed enforcement of statutory mandates is needed to allow the FDA to "take the time to make sure we have in place the foundational elements of a robust and sustainable framework for regulating the non-combustible forms of nicotine delivery" and will promote innovation. In our view, it will have the opposite effect. It will postpone provision of the information the FDA needs to determine which, if any, such products actually meet the public health standard. Experience since the introduction of e-cigarettes demonstrates that a lack of meaningful regulation will not foster innovation consistent with your public health goals. FDA's decision creates an environment that discourages companies from spending money on scientific research, thus allowing highly flavored products that are widely appealing to youth and are cheap to manufacture to dominate the market.

CONCLUSION

Your vision of a comprehensive agency-wide regulatory program to drive down use of the tobacco products that cause the most disease and death, and to reduce excessive healthcare costs, has the potential to provide a pathway to historic change. Such a program must be aimed at eliminating the use of all combusted tobacco products and not only cigarettes. It must distinguish between products that have been shown to help smokers quit using any tobacco product, or for the subset of smokers who can't quit in the short run, switch completely to demonstrably less hazardous products, and those for which no such showing has been made. It should not permit the marketing of products that play no useful role in reducing the death and disease caused by current tobacco use. Products that do not meet these standards simply addict their users while providing no public health benefit. A comprehensive program properly designed to achieve these objectives could greatly accelerate the end of the tobacco disease epidemic in our country.

We look forward to fully participating in the opportunities for public input that FDA intends to provide, and working in other ways with you and your staff, to help fashion a comprehensive approach to nicotine that achieves the full potential of FDA's regulatory authority to end the scourge of tobacco-related disease and death.

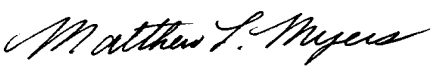
[15] We also are concerned that the FDA's new policy of allowing products to stay on the market pending FDA review of applications for marketing orders will extend even further the marketing of many products that do not meet the statutory standards. In 2011, immediately before the deadline for the filing of substantial equivalence applications, the FDA received more than 3,000 applications. Despite the fact that the FDA has itself admitted that many of these applications were deficient, they functioned to keep products on the market despite repeated failures to provide information necessary to establish substantial equivalence. The large majority of the products covered by these thousands of applications remain on the market, without a decision by the FDA, more than six years after they were filed. As discussed below, the FDA now is reexamining whether to continue its review of these Provisional Substantial Equivalence applications. We are deeply concerned that permitting newly deemed products to remain on the market indefinitely pending FDA action will allow dangerous products to be marketed for many years to come.

Sincerely,

Christopher W. Hansen
President
American Cancer Society Cancer Action Network

Nancy A. Brown
Chief Executive Officer
American Heart Association

Harold P. Wimmer
National President and CEO
American Lung Association



Matthew L. Myers
President
Campaign for Tobacco-Free Kids

Robin Koval
CEO and President
Truth Initiative

CC: Mitch Zeller, Director, Center for Tobacco Products