

## SUMMARY: TPSAC REPORT ON DISSOLVABLE TOBACCO PRODUCTS

March 1, 2012

### **Introduction and Statement of Charge**

This document provides a summary of the report of the Tobacco Products Scientific Advisory Committee (TPSAC) on dissolvable tobacco products (DTP). Under Section 907(f) of the Family Smoking Prevention and Tobacco Control Act, the TPSAC was charged with developing a report on "...the nature and impact of the use of dissolvable tobacco products on the public health, including such use among children." (see Table 1) As detailed below, the TPSAC reviewed and discussed a wide array of materials, submissions, and presentations relevant to its charge. Those materials, along with the transcripts of the open portions of the TPSAC meetings, constitute the evidence evaluated by the TPSAC in responding to its charge. This summary, together with the materials considered by the TPSAC and the transcripts of its meetings, constitute its report.

### **Table 1. Charges to the Tobacco Products Scientific Advisory Committee (TPSAC) under the Family Smoking Prevention and Tobacco Control Act**

#### **Section 907(a)(3)(B) Tobacco Product Standards**

TPSAC is to consider:

- “(I) the risks and benefits to the population as a whole, including users and nonusers of tobacco products, of the proposed standard;
- (II) the increased or decreased likelihood that existing users of tobacco products will stop using such products; and
- (III) the increased or decreased likelihood that those who do not use tobacco products will start using such products.”

#### **Section 907(f) Dissolvable Tobacco Products**

TPSAC is required to review and provide recommendations to the FDA regarding the “the nature and impact of the use of dissolvable tobacco products on the public health, including such use among children.”

### **Committee Approach**

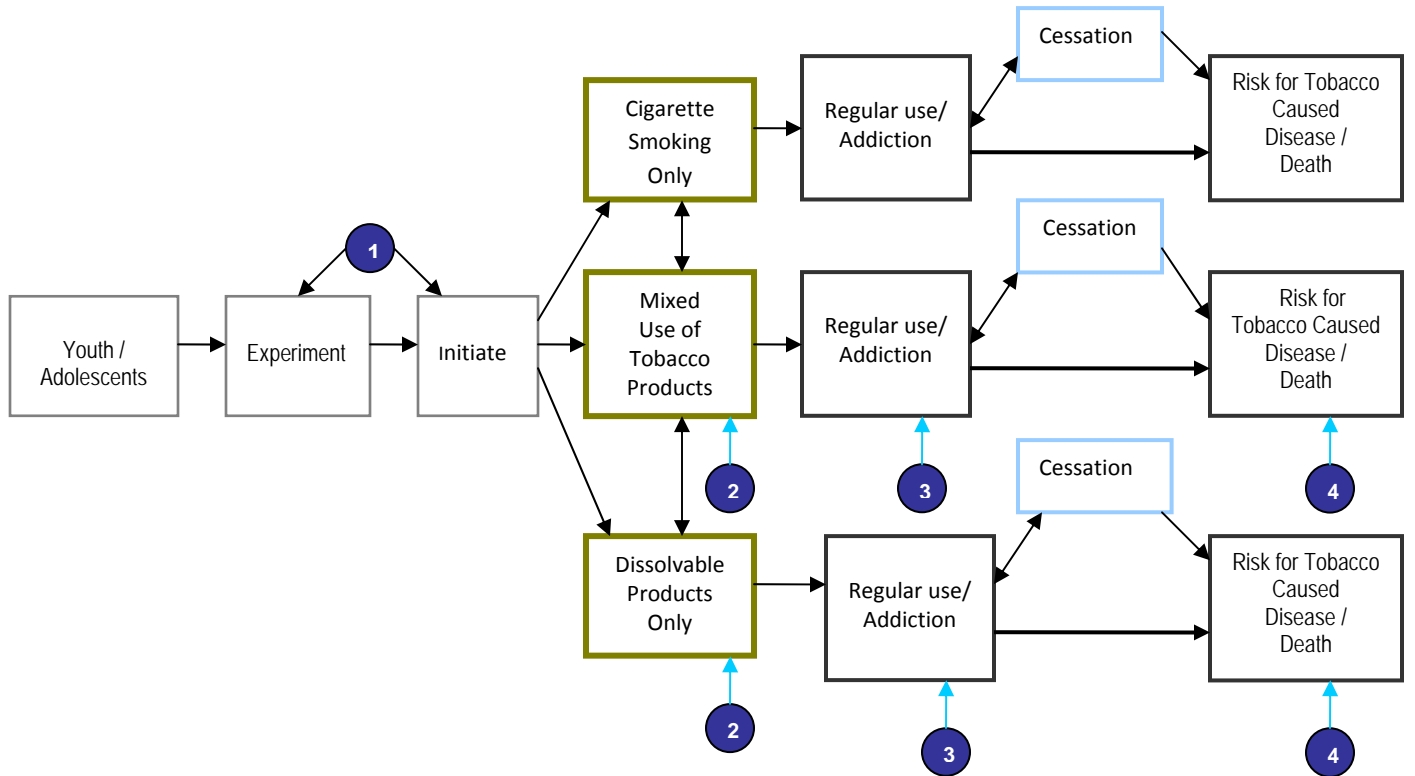
The committee completed the task of developing this report over the course of three meetings, July 21-22, 2011, January 18-20, 2012, and March 1, 2012. The initial meeting was largely for the purpose of information-gathering, as were the initial two days of the second. The TPSAC spent most of January 20, 2012 in open discussion of the full set of materials that it had received. In this discussion, the committee members: 1) evaluated the relevant papers from the peer-reviewed literature for key findings; 2) considered the findings of the scan of the industry documents and the main points of the tobacco industry presentations; 3) reviewed themes from the open public hearing and submissions to FDA; and 4) considered the presentations on the experience and perceptions of youth with regard to DTPs. Following this meeting a summary was prepared and reviewed by the TPSAC on March 1 and revised based on these discussions before approval on March 1, 2012.

The TPSAC addressed the charge as stated and did not consider the broader issue of harm reduction and how dissolvable tobacco products might figure into harm reduction strategies. For this report, the TPSAC considered dissolvable tobacco products to be those so-labeled by industry without offering a specific definition.

### **Committee Framework**

To guide its integration of the evidence, the TPSAC developed a conceptual framework describing the potential roles of DTPs in smoking experimentation and initiation, addiction and regular tobacco use, and risks and benefits to health (Figure 1). *The TPSAC acknowledges that the framework necessarily oversimplifies the potential complexities of tobacco use, particularly if the array of nicotine-containing products continues to expand. For simplicity, the framework represents only three potential patterns of tobacco-product use: cigarettes alone, DTPs alone, and mixed patterns involving multiple products, including DTPs.* The numbers on the figure indicate those points at which the availability of DTPs could have impact. In this framework, the availability of DTPs might affect the likelihood of experimentation and initiation of tobacco product use (#1 in the figure) and also affect progression to regular use and addiction (#2); the model also reflects the possibility that DTPs would influence the maintenance of tobacco use and nicotine addiction and the likelihood of cessation (#3). Further, the framework acknowledges that risk for morbidity and premature mortality caused by use of tobacco products could be affected by use of DTPs (#4), either increased or decreased. A potential benefit of availability of DTPs would be a reduction in risk of tobacco caused morbidity and premature mortality. In addressing its charge, the TPSAC searched for evidence relevant to determining if the availability of DTPs might have any consequences at these points in the framework and to estimating the potential magnitude of any effects.

**Figure 1. Conceptual Framework: From Experimentation to Disease**



Hypothesized mechanisms by which dissolvable tobacco products could have impact on public health. The pathways include 1) effects on experimentation and initiation of cigarette smoking as a consequence of access to an oral, nicotine-containing product; 2) experimental use leading to an established pattern of mixed use of tobacco products (e.g., dissolvable products, other smokeless products, and/or cigarettes); 3) decreased or increased likelihood of smoking cessation, given a nicotine-delivering product that can be used where smoking is not permitted; and 4) differing risk profile for tobacco-caused diseases and premature mortality from, or partial to complete replacement of cigarette use by DTPs.

**Key Findings from the Evidence Review**

As described, the TPSAC reviewed a variety of sources of evidence on DTPs marketed up to this date. On the whole the evidence was limited and did not provide any information relevant to evaluating some individual DTPs. The transcripts of the TPSAC discussions document the synthesis and summarization of the evidence by the TPSAC. A brief, tabular summary of the main findings of the TPSAC’s review of the evidence follows, organized by the type of evidence:

**Peer-Reviewed Literature**

- **Constituents:** There is variation across products in contents of nicotine and tobacco-specific nitrosamines (TSNAs). Available data for some products show delivery to users of lower amounts

of nicotine and TSNA than are delivered by cigarettes. Heavy metals are present, also in variable amounts.

- Abuse liability: The limited data available indicate that abuse liability is lower for current DTPs than for conventional cigarettes and for most conventional smokeless tobacco products (STs) now available in the United States.
- Cessation: Evidence considered by the TPSAC suggests that use of DTPs may reduce cigarette consumption, but does not completely substitute for smoking in most regular cigarette smokers.
- Health risk: Based on understanding of the delivery of toxins to cigarette smokers, exclusive use of DTPs should be less hazardous than regular smoking of cigarettes now marketed in the United States. The TSNA content of DTPs is lower than that of most currently marketed ST products but the public health implications of this difference are not presently known. There are no epidemiological data available on the absolute health risks of these products as they are currently used in the population.
- Consumer perception: Little data are available. One study showed that Ariva was perceived as being a non-tobacco product. This perception may extend to other DTPs.
- Consumer response: In general, consumers have not responded positively to current products.
- Childhood poisoning: Studies in the literature indicate that to date there have been few accidental ingestions with serious consequences.

#### ***Industry Presentations and Documents***

- Product range: There are a variety of products with different contents of nicotine, TSNA and other constituents, such as benzo[a]pyrene and heavy metals.
- Cigarette use: Among those who both smoke cigarettes and use DTPs, users of DTPs smoke fewer cigarettes than nonusers.
- Marketing: DTPs are presently marketed as accessory products for smokers or other tobacco users to deal with craving in circumstances where social perceptions or bans make smoking difficult or impossible.
- Cessation: Presently, and consistent with current regulatory standards, DTPs are not being positioned by the industry as effective for cessation of cigarette smoking.
- Youth: Presentations by industry indicate that DTPs are not directed at youth.

#### ***Open Public Hearing and Public Submissions***

- Product perception: Based on the reports of individuals, the TPSAC found evidence that DTPs were neither well liked nor being widely used by themselves for smoking cessation. Some of those who commented suggested that people may have a perception of the risks of DTPs that is exaggerated. Data presented from youth surveys suggested that DTPs may not be recognized as tobacco products.
- Government actions: Concern was expressed by some that DTPs might be banned. Additionally, some recommended that government agencies should more pro-actively educate the public on the risks associated with specific products and not just the risks of tobacco in general.

### **Review of Swedish Experience with Snus**

- Context: The context of the Swedish experience with snus has unique characteristics (historic use of snus, marketing, government engagement, voluntary product standard and exclusive use pattern) that limits generalizability for DTPs in the United States.
- Health benefits: Presentations to the TPSAC and peer reviewed literature document a lowering of rates of lung cancer as snus use increased and cigarette smoking decreased in Sweden. Epidemiological studies showed lower relative risks for major smoking caused diseases among snus users compared with regular cigarette smokers. Data from the Swedish experience indicate that for health benefits of snus use to be obtained, complete substitution of snus for cigarettes was needed.
- New users: At present, 50% of snus users are new tobacco users.
- Use by sex: More males tend to be exclusive snus users, reflecting historical Swedish tradition, while most female tobacco users continue to smoke cigarettes.
- Labeling: Labeling in Sweden differs from that in the United States.

### **Information on Youth**

- Youth use of DTPs: To date, there is little use of DTPs by youth, even though several products have been on the market for about 10 years. The Indiana experience during test marketing of one DTP suggested that some youth would try DTPs, particularly those already smoking cigarettes. Data from a survey in Virginia suggested that youth not perceiving DTPs as a tobacco product would be more likely to try them.
- Packaging: Appeal to youth is likely to depend on packaging.

### **Responses to Charge Issues**

*The risks and benefits to the population as a whole, including users and non-users of tobacco products*

*This element of the charge addresses the risks and benefits of DTPs. As noted, the TPSAC considerations of this question are based in counterfactual comparisons of a scenario of the United States, absent DTPs, to scenarios with current types of DTPs available. In constructing comparison scenarios, the TPSAC was constrained by the limited “real world” experience to date—10 years with products from Star Scientific Inc. (Ariva and Stonewall) and test marketing of new products in several locations in the United States by several companies.*

The TPSAC considered the burden of tobacco-related morbidity and premature mortality to be the appropriate long-term indicator in addressing this element of its charge. That burden reflects the number of users of tobacco products, their patterns of use, and the risks of the products that they use, as set out in Figure 1. Additionally, the TPSAC considered how DTPs might affect the risk for individuals.

With regard to benefit, the TPSAC concludes that exclusive use of DTPs by an individual would greatly reduce risk for smoking caused disease compared with regular use of cigarettes. The TPSAC framework indicates several ways that DTPs could reduce the population disease burden caused by tobacco use: 1) decreasing the number of smokers, if availability of DTPs increases successful cessation or decreases the likelihood of

initiation and use of smoked products, and 2) decreasing the risk of tobacco caused disease, if availability of DTPs sufficiently reduces cigarette smoking.

The TPSAC framework indicates how DTPs could increase the population disease burden caused by tobacco use: increasing the number of smokers, if availability of DTPs decreases successful cessation or increases the likelihood of initiation and use of smoked products.

The TPSAC noted the great uncertainty concerning how availability of DTPs would impact the burden of tobacco-caused morbidity and premature mortality in the population. To date, experience is limited and observational evidence on how DTPs might affect use of tobacco products is lacking. After 10 years of availability, the products made by Star Scientific, Inc. have had extremely limited market penetration and no apparent overall impact on disease burden. Furthermore, the TPSAC concluded that the context set by all aspects of industry marketing and regulation will be critical in determining the impact of DTPs. The committee was concerned that availability of DTPs with lower risks to health than cigarettes might affect the public perception of all tobacco products, leading to increased use because of reduced concern about health risks of tobacco products generally.

Given the substantial uncertainties and the potential for either risks or benefits, the TPSAC could not reach a conclusion as to the potential point of balance between potential risks and benefits of DTPs on public health.

*The increased or decreased likelihood that existing users of tobacco products will stop using such products.*

The TPSAC concluded that DTPs are presently being positioned as a tobacco product that provides nicotine in circumstances where smoked products and specifically cigarettes cannot be used. Smokefree regulations and changing social norms have narrowed the range of venues where smoking is allowed and acceptable. Marketing strategies examined by the TPSAC gave emphasis to use of DTPs in circumstances under which nicotine intake by smoking is not possible. Additionally, findings of several peer-reviewed papers, industry studies, and anecdotal reports from the public hearing speakers suggest that cigarette smokers do not find the current DTPs to be sufficient by themselves, as an alternative to cigarette smoking. Beyond some anecdotal reports, TPSAC found no information on whether DTPs would increase the likelihood of cessation of cigarette use.

In considering scenarios for addressing this element of its charge, the TPSAC offers the reminder that context will be critical in determining use patterns for DTPs. Will current marketing and product development approaches be continued, giving emphasis to use of DTPs when smoking is not possible or perceived unfavorably? Will DTPs be marketed as a complete substitution for combustible tobacco products? Will adopters use the product as a cessation tool or to maintain their addiction to nicotine? Will the nicotine yield in forthcoming products be different from that of current products?

The TPSAC concluded that the availability of DTPs could either increase the likelihood of cessation of smoking, if they proved to facilitate cessation, or decrease the likelihood of stopping if they served to maintain use of

tobacco products and nicotine addiction by offering a product that can be used in circumstances where smoking is generally not possible. As noted, the TPSAC could not reach any overall judgment as to whether the net consequence of DTPs would be an increase or decrease in the number of people who successfully quit smoking. This uncertainty provides a strong rationale for close surveillance of cessation and any impact of DTPs.

*The increased or decreased likelihood that those who do not use tobacco products will start using such products.*

For this component of the charge, the TPSAC concluded that the available evidence, while limited, leads to a qualitative judgment that availability of DTPs could increase the number of users of tobacco products. This judgment was based on experience with other STs, data presented from the State of Indiana showing that some adolescents were already using DTPs, the survey data on youth perceptions of the products from the State of Virginia, and the potential for youth to be drawn to a novel product. The TPSAC could find no basis for the contrary finding—that availability of DTPs would decrease tobacco product initiation. With the very limited information available, however, the TPSAC could not estimate the magnitude of any potential increment in numbers of new tobacco product users because of sales of DTPs. Based on its finding, the TPSAC offers strong recommendations as to the need for informative surveillance related to DTPs and youth including marketing approaches.

#### **Recommendations for Further Information Gathering, Surveillance, and Research**

To guide regulatory activities and to facilitate accumulation of data on various DTPs a standard product definition is needed.

#### ***Testing of Current and Future Products***

- Further characterization of within-product variation in content of nicotine, TSNA, and other health-relevant components as set out in the FDA list of harmful and potentially harmful constituents; pH should also be measured.
- Characterization of variation in product composition at point-of-sale across the country.
- Characterization of change in product composition with time since manufacture, and the influences of heat and moisture exposure on composition.
- For each product, doses of key components delivered to users should be assessed with an appropriate suite of biomarkers.
- For each product, detailed information is needed on abuse liability and topography in actual use.

## ***Surveillance***

The TPSAC notes that the following recommendations in regard to DTPs also apply to other novel tobacco products.

- Existing surveillance systems should be reviewed and selected based on their suitability and sensitivity to track patterns of DTP use and the various mixed use patterns, particularly among key sentinel populations, e.g., youth, and vulnerable population subgroups.
- Appropriate survey questions will need to be developed for tracking DTP use and a mechanism developed for their rapid integration into ongoing surveys.
- The impact of availability of DTPs on use of other tobacco products, particularly cigarettes, needs to be monitored closely.
- Research/surveillance will be needed to assess perceptions of DTPs and how availability and marketing (including packaging and product development) of DTPs affects perceptions of them and other tobacco products.
- Appropriate survey questions will need to be developed for tracking perceptions and a mechanism developed for their rapid integration into ongoing surveys.
- Information is needed on if and how underage users obtain DTPs.

## ***Research***

For DTPs, as for other tobacco products, there is a need for research methodology and applied research that will be informative with regard to individual risks and public health consequences. Additionally, population models are needed for assessing the consequences of DTP availability.