



# Initial Information on a Novel Nicotine Product

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**Background and Objectives:** This is the first study to assess the appeal and interest among adults in a new consumer tobacco product, ZYN. We also describe ZYN users, patterns of use, and reasons for use.

**Methods:** Two data sets, consisting of a ZYN-naive consumer panel ( $n = 5179$ ) and ZYN users ( $n = 1266$ ), were provided by Swedish Match North America. Descriptive, cross-sectional analyses and logistic regression assessed the perceptions of and likelihood of buying ZYN in the consumer panel and the characteristics of ZYN users.

**Results:** The majority of current smokeless tobacco (ST) users in the consumer panel found that ZYN was moderately-extremely appealing, while never and former tobacco users indicated much less interest; the former were more likely to buy ZYN than other groups. The highest percentage of ZYN users were former tobacco users (43%); very few were never users (4%). The most popular reason for using ZYN was “Less harmful to my health than other tobacco products,” followed by “ease of use.”

**Discussion and Conclusions:** Nonusers of tobacco had very little interest in ZYN. ST users are not only more interested and likely to buy ZYN than other tobacco users, they were the largest group of regular users.

**Scientific Significance:** The first assessment of a new nicotine product, ZYN, suggests that current and former tobacco users may perceive ZYN as a reduced-risk product. ZYN potentially could be used as a smoking/tobacco-cessation aid based on reasons of current users. (*Am J Addict* 2020;00:00–00)

first product in the latter category to be widely distributed is ZYN ([www.ZYN.com](http://www.ZYN.com)), which was test-marketed in Colorado in 2014 by Swedish Match North America (SMNA). Distribution was expanded in June 2016, and it was available nationally in April 2019. To date, ZYN has been marketed by SMNA without advertising (other than a website and in-store) or price promotions. Two other nicotine pouches are also now on the US market, DRYFT (<https://getdryft.com>) and On! ([www.onnicotine.com](http://www.onnicotine.com)). The nicotine pouch products are placed, like Swedish snus, between the upper lip and gum.

None of the three brands contain tobacco, only pharmaceutical-grade nicotine at different levels: ZYN pouches contain either 3 or 6 mg, On! is available in 2, 4, and 8 mg strengths, and DRYFT pouches have 2 and 7 mg. The highest nicotine dose approved by the FDA for medicinal nicotine gum and lozenges is 4 mg. The higher doses of nicotine may be an important distinction, since under-dosing with nicotine replacement therapy (NRT) is cited as a common reason for the low efficacy of these aids.<sup>1,2</sup> Nicotine pouches are consumer products like electronic cigarettes and not medicines, so manufacturers do not and cannot make health or cessation claims.

Other ingredients in ZYN include food-grade additives, fillers, a stabilizer (hydroxypropyl cellulose), pH adjusters, noncaloric sweeteners, and flavorings (cool mint, peppermint, wintergreen, spearmint, cinnamon, and coffee) ([www.zyn.com](http://www.zyn.com)).

A search of PubMed, PsychInfo, Google Scholar, Google, EMBASE, and the Web of Science located no published scientific papers on ZYN or the other two products. A search of NIH RePorter, US, and European trial registries did locate a registered trial “to measure the nicotine delivery profile of ZYN.”<sup>3</sup>

In 2018, SMNA commissioned two marketing surveys on ZYN perceptions and use. The present authors asked SMNA for full access to the data from these surveys to do an independent analysis of the survey results as was done with a previous SMNA marketing study on General Snus.<sup>4</sup>

## INTRODUCTION

New consumer products containing nicotine—which may or may not include tobacco—are rapidly entering the US market. Examples of new product categories are electronic cigarettes, heat-not-burn products, and nicotine pouches. The

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The net public health effect from the introduction of any new smoke-free nicotine/tobacco product will be balanced by the application of the risk/use equilibrium<sup>5</sup> to at least three component groups: (a) never tobacco users who are attracted to and use ZYN, with its associated increase in disease risks, if any; (b) smokers and smokeless tobacco (ST) users who switch to ZYN instead of continuing, with associated decrease in risks; (c) smokers and ST users who become sustained dual users of ZYN and tobacco instead of quitting. The objectives of this paper were to (a) assess the appeal and interest in buying ZYN among adults; (b) describe the demographics of ZYN users and patterns of ZYN use after purchase; and (c) explore the reasons for using ZYN.

## METHOD

### Data Sources

SMNA started selling ZYN in selected US cities in 2014. Following draft guidance from the FDA for preparation of premarket tobacco product applications, SMNA sponsored two surveys of adults, the first from consumer panels who had no previous exposure to or use of ZYN and the second, a cross-sectional survey of current ZYN users. Both surveys were designed and conducted by Kantar Health, a private marketing research vendor. As in the past,<sup>4</sup> SMNA honored our request to perform independent analyses of these ZYN surveys. Other than providing us with the data, the company had no role in the conduct of the research or reporting of the results.

### The Consumer Panel Sample

The consumer panel sample collected information on use of all tobacco products and intention to buy ZYN after being exposed to a description of the product and its packaging/labels. Participants were recruited from three existing online consumer panels: Lightspeed Research Panel, Survey Sampling International, and Research Now. Participants received compensation in the form of reward points or money from the panel of which they were a member. Data collection occurred about 3 years after ZYN was test-marketed in the United States, that is, December 2017 to February 2018.

Kantar intended to enroll 814 participants of legal purchasing age in each of the following categories: never tobacco users, legal age to age 24; never tobacco users, ages 24+; former tobacco users; current cigarette smokers, legal age to age 24 who intended to quit; current cigarette smokers, age 24+ who intended to quit; and current non-cigarette tobacco users of any age who did not plan to quit. The intended total sample size was 5698, but the final sample included only 5179 participants. It is important to note that Kantar supplied no weighting variables, so the final sample cannot be used to provide population estimates.

### The ZYN User Sample

The ZYN user sample was recruited from retail stores via stickers placed on ZYN packages from November 27 to December 11, 2017. Recruitment occurred simultaneously in about 4500 stores across 11 western states, via the placement of 65 cans per store (approximately 290 000 cans in total).

The invitation sticker directed ZYN purchasers to a website to complete the retrospective survey. Participants were eligible if they had used ZYN “fairly regularly” and were now using it every day or some days. The final sample included 1266 participants. The vendor attempted, unsuccessfully, to enroll ZYN nonusers from existing online consumer panels based on ZYN users’ demographic characteristics. However, we didn’t include them in our analyses for two reasons. First, ZYN nonusers were not comparable with ZYN users; they were 10 years older and had a completely different distribution of tobacco use (50% current smokers and 8% current ST users vs 8% and 26%, respectively, for ZYN users). Second, more important, participants who did not use ZYN had no applicable information (eg, flavors, nicotine dose, and reasons for use).

### Measures

#### Tobacco Status

Both the consumer panel and ZYN users were asked the following questions about cigarettes, e-cigarettes, moist snuff, chewing tobacco, snus, nicotine pouches, aids to help stop smoking (nicotine medicines), cigars, cigarillos, filtered cigars filled with tobacco, pipe tobacco, and hookah (or water pipe tobacco).

- Have you ever used any of the following tobacco or nicotine products, even just one or two times?
- [Ask if ever used cigarettes] How many cigarettes have you smoked in your entire life? A pack usually has 20 cigarettes in it.
- [Ask if ever used tobacco/nicotine products] Have you ever used any of the following tobacco or nicotine products fairly regularly?

From these questions, we constructed a new set of tobacco categories for both the consumer panel and ZYN users study that were relevant to our analysis (Table 1). The categories included never users, current smokers, current ST users (ie, moist snuff, chewing tobacco, and/or snus), dual current cigarettes and ST users, current other tobacco products (ie, e-cigarettes, cigar, pipe, and hookah), and former tobacco users. Notably, participants in each category may have also used nicotine medicines. The definitions of these groups are outlined in Table 1.

In addition, we identified *exclusive* current users of cigarettes, e-cigarettes, ST, and other combustible tobacco products (ie, cigar, pipe, and/or hookah). For example,

**TABLE 1.** Definitions of tobacco use and distribution of consumer panel and ZYN users

Tobacco use	Definition	Consumer panel <sup>a</sup>		ZYN users <sup>b</sup>	
		<i>N</i>	%	<i>N</i>	%
Never tobacco user	Had never used any tobacco products; Never smoked 100 cigarettes; or Never regularly used other tobacco products	1627	31.5	47	3.7
Current smoker	Had smoked at least 100 cigarettes and now smoke every day/some days; May also currently use e-cigarettes, other combustible, and/or nicotine pouches, <i>excluding ST</i>	1700	31.0	106	8.4
Current ST	Had used ST fairly regularly and now used every day/some days; May also currently use e-cigarettes, other combustible, and/or nicotine pouches, <i>excluding cigarettes</i>	170	3.3	332	26.3
Dual current cigarettes and ST	Currently smoke cigarettes and use ST; May also use currently e-cigarettes, other combustible, and/or nicotine pouches	211	4.1	90	7.1
Current other users	Had used e-cigarettes, other combustible, and/or nicotine pouches and now use every day/some days, <i>excluding cigarettes and ST</i>	637	12.4	147	11.7
Former tobacco users	Had smoked 100 cigarettes and/or; Had fairly regularly used other tobacco products; and Now not at all smoke cigarettes and/or use other tobacco products	814	15.8	540	42.8
<b>Total</b>		<b>5159</b>	<b>100.0</b>	<b>1262</b>	<b>100.0</b>

Abbreviation: ST = smokeless tobacco.

<sup>a</sup>Excluded those who had missing demographic characteristics and tobacco use.

<sup>b</sup>Excluded those who had missing tobacco use.

exclusive current smokers were those who currently smoked cigarettes every day or some days and did *not* use other tobacco products.

### Demographic Characteristics

Both the consumer panel and ZYN users were asked about basic demographic characteristics, including sex, age group (18-24, 25-34, 35-44, 45-54, and 55 years and older), race/ethnicity (white, black, Hispanic, and other race), education (<high school, high school, some college, college, or more), household income (<\$25 000, \$250 000-\$49 999, \$50 000-74 999, ≥\$75 000, and missing income), and marital status (never married, married, separated/divorced, and widowed).

### Appeal of ZYN and Likelihood of Buying ZYN and Other Tobacco Products

Respondents in the consumer panel were shown the product description and package label and were asked “How appealing do you consider ZYN to be, if at all?” with choices of 1. Not at all, 2. Slightly appealing, 3. Moderately appealing, 4. Very appealing, or 5. Extremely appealing. We constructed three categories: Little/none (1-2), moderate (3), and very (4-5).

Next, all participants in the panel were asked about their likelihood of buying ZYN and other tobacco products:

“How likely are you to buy ZYN for yourself, if sold in a store where you usually shop?” Participants could select their responses from ...

“1. No chance, almost none [1 in 100], 2. Very slight possibility [1 in 10], 3. Slight possibility [2 in 10], 4. Some possibility [3 in 10], 5. Fair possibility [4 in 10], 6. Fairly good possibility [5 in 10], 7. Good possibility [6 in 10], 8. Probable [7 in 10], 9. Very probable [7 in 10], 10. Almost sure [9 in 10], or 11. Certain, practically certain [99+ in 100].”

For our analysis, we condensed these 11 scales into five categories: (a) no chance/almost none, (b) very slight, slight, or some possibility, (c) fair, fairly good, or good possibility, (d) probable, very probable, or almost sure, and (e) certain/practically certain.

In addition, we created a binary variable: unlikely (from groups 1 and 2, no chance to some possibility) and likely to buy (from groups 3 to 5, fair possibility to practically certain).

### Reasons for Starting to Use ZYN

ZYN users were asked two sets of questions about why they started using ZYN (Table 2). The first set, based on tobacco

TABLE 2. ZYN users: reasons (%) for using ZYN

	All	Never users	Current smokers	Current ST users	Dual cigarette + ST	Current others	Former users
N	1262	47	106	332	90	147	540
To help ...							
Reduce cigarette smoking	50.0	n/a	65.1	18.8	43.3	44.4	n/a
Quit cigarette smoking	47.4	n/a	62.3	18.8	40.0	44.4	n/a
Reduce other tobacco use	45.6	25.5	41.5	51.2	47.8	42.9	45.0
Quit other tobacco use	51.5	23.4	33.0	49.7	53.3	46.9	59.6
Other reasons							
Less harmful to my health than other tobacco products	61.8	51.1	47.2	64.8	52.2	70.7	63.0
Ease of use	52.5	46.8	56.6	56.9	53.3	64.6	46.1
No one can tell when use	50.4	44.7	50.9	58.7	47.8	57.8	44.1
Less harmful to my health than cigarettes	49.0	36.2	72.6	36.4	60.0	56.5	49.4
Does not cause me to smell like smoke/tobacco	48.3	36.2	65.1	41.0	47.8	59.2	47.8
To avoid spitting	47.8	40.4	47.2	56.6	47.8	52.4	41.9
Comes in flavors I like	44.5	46.8	56.6	43.4	46.7	57.1	38.7
To use when other tobacco products are not allowed	44.1	40.4	57.5	45.8	48.9	51.0	38.0
To use when other tobacco products are not appropriate	43.9	29.8	48.1	47.3	51.1	55.1	38.0
More acceptable to non-tobacco users	36.0	38.3	38.7	36.4	37.8	40.8	33.3
Curious to see what it was like	34.5	40.4	36.8	38.9	38.9	39.5	28.9
Less harmful for those around me than cigarettes	32.6	19.1	52.8	22.9	38.9	43.5	31.7
Two different levels of nicotine strength	18.2	12.8	18.9	19.3	16.7	23.8	16.7
Recommended by person who works at the store	10.7	8.5	10.4	13.3	12.2	8.8	9.6
To add variety to the products I use	5.2	2.1	5.7	9.0	8.9	9.5	1.1
None of above	1.0	0.0	0.0	0.3	1.1	2.0	1.5

Abbreviation: ST = smokeless tobacco.

status, included help to reduce or quit cigarette smoking and/or other tobacco products. The second set related to various characteristics of ZYN (eg, flavors, nicotine strength, and no spitting) and their impact on users and bystanders (eg, less harmful and no smell). Participants could select multiple reasons.

### Descriptive Characteristics of ZYN Users

The flavor and nicotine strength of ZYN were recorded from the stickers of users who were enrolled. In addition, they were asked when they first started use, whether they used 6 mg strength in the past 30 days and other characteristics of past 7-day use.

### Analysis

The main data analyses in this study were based on its cross-sectional design. Means and standard deviations for continuous variables, frequencies and percentage values for categorical variables were calculated and stratified by tobacco use status. Because this was a descriptive study, we undertook only a few instances of hypothesis testing.

For the consumer panel sample, we excluded participants who had missing demographic characteristics and tobacco use status (less than 1%). The final sample was 5159. Logistic regression was employed to estimate the association between tobacco use status and the likelihood to buy ZYN, expressed as odds ratios (ORs). Instead of using never tobacco users as a reference, we used current smokers. In addition, we also calculated the estimated distribution of 1000 potential ZYN buyers by using the ORs of tobacco users obtained from the logistic model. Specifically, we estimated the following:

$$1000 \text{ potential ZYN buyers} = X \left( \sum OR_s \right),$$

where  $X$  is the number of current smokers who would buy ZYN per 1000 potential ZYN buyers and

$$\begin{aligned} \sum OR_s = & OR_{\text{current smoker}} + OR_{\text{never user}} + OR_{\text{current ST}} \\ & + OR_{\text{current dual}} + OR_{\text{current others}} + OR_{\text{former user}}. \end{aligned}$$

The number of potential buyers from other tobacco categories was calculated by multiplying its OR with the number of current smokers who would buy ZYN ( $X$ ).

For the ZYN user sample, our main analyses were based on 1266 participants. After excluding those with missing information on tobacco use status, the final sample was 1262. Similar to the consumer sample, frequencies and percentage values were calculated and stratified by tobacco use status.

## RESULTS

### Participant Characteristics

Table 1 contains the numbers and percentages of consumer panel and ZYN user surveys, according to

tobacco status. While the majority of consumer panel members were never tobacco users (32%) or current smokers (31%), the majority of ZYN users were former tobacco users (43%) or current ST users (26%). In addition, among all current ST users who used ZYN (current ST and current ST who were also current cigarette smokers,  $n = 422$ ), about 31% were also exclusive moist snuff users ( $n = 130$ ), 19% were exclusive snus users ( $n = 82$ ), 6% were exclusive chewing tobacco users ( $n = 27$ ); the rest (44%) used at least two of these products ( $n = 183$ ) (results not shown).

The consumer panel was younger and about half were men, whereas the majority of ZYN users in the ZYN sampling protocol were men (88%-89%). The majority of participants in both samples were non-Hispanic white (76%-90%) high-school graduates (53%-58%), and nearly half were married (42%-48%). About half of the consumer panel participants had income lower than \$50 000 while about 60% of ZYN users earned \$50 000 or more.

### Consumer Panel

ZYN appealed to only a minority of never and former tobacco users (11%-12%). In contrast, the product was moderately-extremely appealing to 36% of current smokers, 52% of current ST users, and 75% of dual cigarette-ST users. The appeal of ZYN among these groups was also reflected in their likelihood to buy the product, which is illustrated in Figure 1. Only 2% to 3% of never and former users were likely to buy ZYN (fair-good possibility and higher), compared with 64% of dual users, 44% of current ST users, and 27% of current smokers.

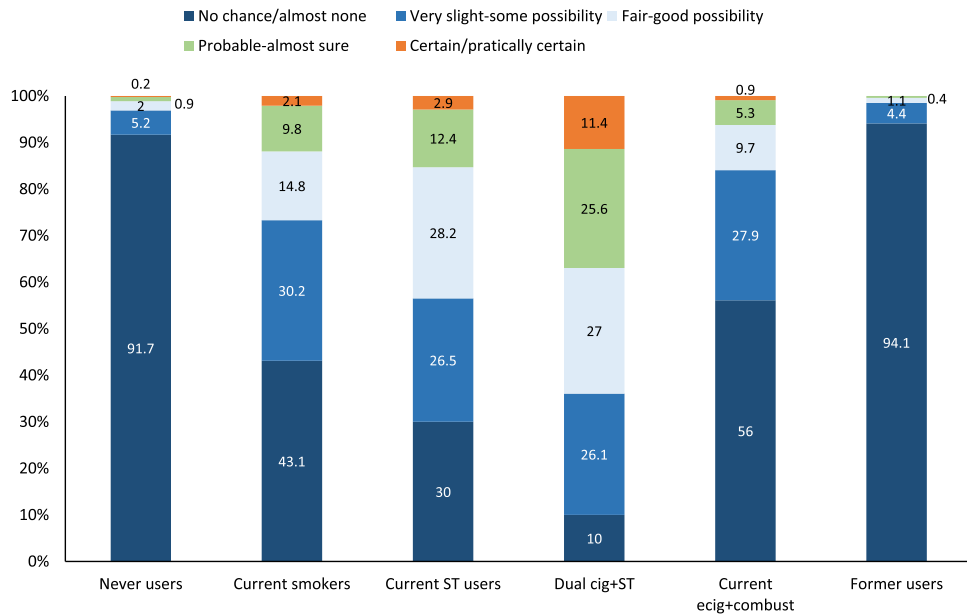
Figure 2 shows the percentage of exclusive current smokers, e-cigarette users and ST users who were likely to buy ZYN and other tobacco or nicotine products. NRT was the most popular among smokers (24%), followed by ZYN and e-cigarettes, while e-cigarette users were less likely to use the alternate products. Exclusive ST users were the most likely to buy ZYN (41%) and had little to no interest in e-cigarettes (2%), NRT (8%), or cigarettes (2%).

With current smokers as the referent group, the odds of buying ZYN were 1.75 times higher among current ST users and almost four times higher among dual users while the odds of never and former tobacco users were much lower ( $OR = 0.09$ , confidence interval  $[CI] = 0.06-0.12$  and  $OR = 0.05$ ,  $CI = 0.03-0.09$ , respectively) (results are not shown).

Using these ORs, we calculated the distribution of 1000 prospective ZYN buyers. Current ST and current dual users made up over three-quarters of the prospective buyers (242 and 536, respectively); former tobacco users and never users made up for much lower numbers (7 and 12, respectively).

### ZYN Users

From Table 1, 43% of ZYN users were former tobacco users (540 of 1262), which consisted of 71 former cigarette smokers, 170 former ST users, 288 former cigarette and ST users, and 11 former e-cigarette and other combustible users (results not shown). About a quarter of ZYN users (26%)



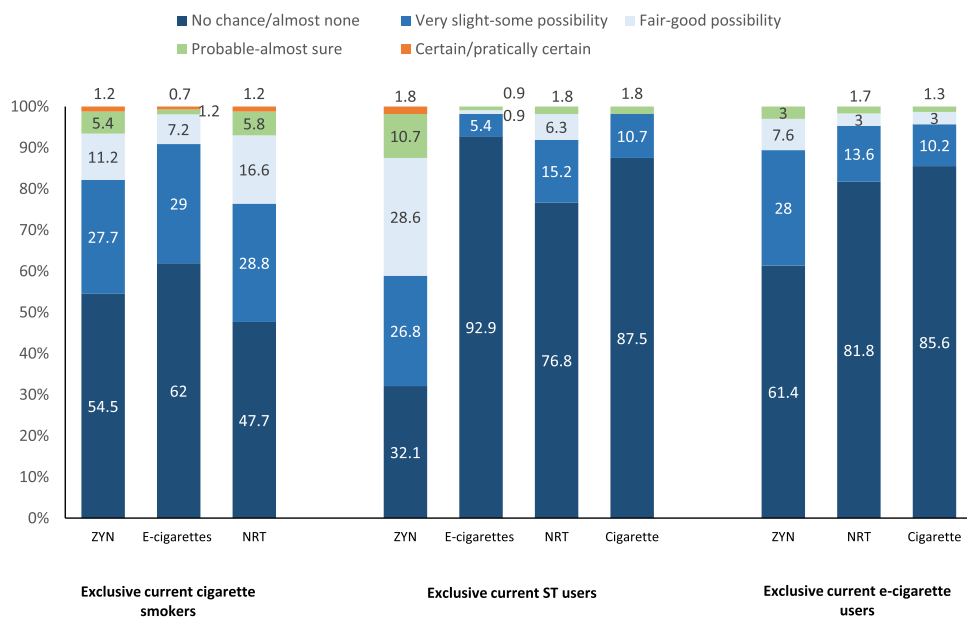
**FIGURE 1.** The consumer panel: likelihood to buy ZYN.

were current ST users and only 8% were current smokers. Approximately 4% of ZYN users were never tobacco users because they had not smoked at least 100 cigarettes or regularly used other tobacco products. However, all of them were currently using one or more tobacco products.

Most ZYN users were everyday users. Wintergreen and cool mint were the most popular flavors; coffee was the least popular. The majority (72%) used the 6 mg. version and over

80% had been using the product more than 3 months. Just over half of users always placed the pouch between the gum and upper lip, and most used only one pouch, sometimes for over 60 minutes.

Table 2 lists the reasons why ZYN users started using the product, according to tobacco use status. Over 60% of current smokers stated that they used ZYN to help reduce and/or quit cigarettes, and 60% of former users reported that they used



**FIGURE 2.** The consumer panel: likelihood of buying ZYN, e-cigarettes, and NRT among exclusive current tobacco users. NRT = nicotine replacement therapy; ST = smokeless tobacco.

ZYN to help quit other tobacco use. The most popular other reason was that ZYN “is less harmful to my health than other tobacco products, excluding cigarettes” (62%). Other common reasons were ease of use (53%), no one can tell when using it (50%), less harmful to my health than cigarettes (49%), no smell like smoke/tobacco and to avoid spitting (48%).

Notably, within the same reasons, there were variations among tobacco use status. For example, 47% of current smokers chose the less harmful to my health than other tobacco products while 71% of current other tobacco users selected this reason.

## DISCUSSION

This paper is the first assessment of a new consumer tobacco product, ZYN nicotine pouches. The first aim of this study was to assess the overall appeal of and future intention to buy ZYN among tobacco users and nonusers after they were shown a description of ZYN and its packaging. Almost 90% of never and former users did not find ZYN to be appealing, while one-third of current smokers, more than half of current ST users and two-thirds of dual cigarette-ST users did. More importantly, only 3% and 2% of never and former users were interested in buying the product.

In addition, we found that the likelihood of buying ZYN compared with other tobacco products was highest among exclusive ST users, while the likelihood of buying NRT was highest among exclusive current smokers. ST users may be more inclined to buy ZYN because its use is similar to other ST products, that is, placing the product between the lip and gum. Another factor may be that ZYN was located in the ST section at retail by the manufacturer. Our results are similar to a recent analysis of an online panel, which found that smokers had interest in snus after receipt of modified-risk information about snus, while there was little interest among former and never tobacco users.<sup>6</sup>

The second aim was to describe the demographics of ZYN users and patterns of ZYN use after purchase. The average age of ZYN users was about 33 years, and the vast majority were men, white and completed at least high school diploma with income more than \$50 000. Consistent with the appeal and likelihood to buy results, the majority of ZYN users were current ST users and former tobacco users; most of the latter group were former dual cigarette-ST users. About 90% of ZYN users used them every day and most used ZYN with 6 mg of nicotine. More than one-third have used ZYN about 3 to 6 months, although survey enrollment was based on regular use.

The third aim was to explore the main reasons for using ZYN. The most among current ST users were “less harmful...,” “no one can tell when using,” and “to avoid spitting.” Among current other tobacco users, the most popular reason was “less harmful to my health than other tobacco products.” “Less harmful for my health than cigarettes” and “do not cause me to smell like smoke/tobacco” were the top answers among current smokers. For former users, “less harmful than other tobacco and

cigarettes” and “no smell like smoke/tobacco” were the common reasons.

While this study provides important insights about a new nicotine product, there are several limitations. First, our findings are not nationally representative of the US population. The disproportionate larger percentages of never users and current smokers from the consumer panel are due to the recruitment criteria as previously discussed. Second, the ZYN user sample is self-selected due to the recruitment process through invitation stickers on cans. Third, we do not have information on consumers who bought ZYN and did not respond to the survey. These users may be different from those who completed the survey.

Fourth, there was no information about tobacco cessation due to ZYN and time since quitting tobacco. Hence, we do not know whether former tobacco users who currently use ZYN were recent quitters. It is possible that the tobacco users who are willing to quit and the recent quitters may be inclined to use ZYN as in the case of e-cigarettes.<sup>7-10</sup> Finally, we have no data on the frequency and quantity of ZYN pouches and other tobacco products.

Despite these limitations, this study has an important strength. It is the first to assess the appeal and likelihood to buy, and the actual usage of a new tobacco product, ZYN. In conclusion, nonusers of tobacco had very little interest in ZYN. ST users were not only more interested and likely to buy ZYN than other tobacco users in ZYN, they constituted the majority of ZYN regular users.

## Declaration of Interests

Drs Plurphanswat and Rodu were supported by unrestricted grants from tobacco manufacturers to the University of Louisville and by the Kentucky Research Challenge Trust Fund. Neither author has any financial or other personal relationship with the sponsors. Dr Hughes has received consulting and speaking fees from several companies that develop or market pharmacological and behavioral treatments for smoking cessation or harm reduction and from several non-profit organizations that promote tobacco control. He has recently received consulting fees from Swedish Match, Altria, and Philip Morris International to assist their efforts to develop less-risky tobacco products. Dr Fagerström has received consulting and speaking fees from many companies that develop or market pharmacological and behavioral treatments for smoking cessation. He currently receives consulting fees from Swedish Match and has received fees in the past from Philip Morris International and BAT to assist their efforts to develop less-risky tobacco products.

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