

Brief Survey of Current Oral Tobacco and Nicotine Product Use in Sweden and Denmark *

by

Krishna Prasad and Lauren Edward

BAT (Investments) Limited, Regents Park Road, Millbrook, Southampton SO15 8TL, UK

SUMMARY

Exclusive use of Swedish snus is associated with a reduction in associated health risks as compared with cigarette smoking. Similar to Swedish snus but without tobacco, modern oral nicotine pouches are smokeless nicotine products with the potential to offer similar or greater reductions of risks associated with tobacco use. Currently, little is known about the use prevalence of these products in established markets for Swedish snus. In this descriptive study, two market research surveys were conducted in 2019 among 18–64-year-olds in Sweden ($n = 7003$; male, 51.1%) and Denmark ($n = 4402$; male, 50.5%) on use of these oral tobacco and nicotine products in order to explore basic user demographics and average daily consumption (ADC) of oral nicotine products. In Sweden, 18.5% of participants reported currently using oral products (17.1% snus; 1.4% nicotine pouch), while only 11.0% smoked cigarettes. In Denmark, by contrast, 20.5% of participants reported currently using cigarettes, whereas 3.2% used oral products (0.8% snus; 2.4% nicotine pouch). More men than women reported using oral products in both countries, and most oral product users were younger than 45 years. The ADC of all oral products was 11.1 pouches/day in Sweden, but only 5.6 pouches/day in Denmark, where nicotine pouch use was predominant. In summary, Swedish snus continues to account for most oral tobacco or nicotine product use in Sweden, but nicotine pouch use has surpassed snus use (2.4% vs. 0.8%) in Denmark. Tobacco

users who switch to nicotine pouches may reduce their health risks as compared to continuing tobacco product use, and nicotine pouches can contribute to tobacco harm reduction for the population as a whole. [Contrib. Tob. Nicotine Res. 34 (2025) 34–39]

KEYWORDS

Average daily consumption; modern oral nicotine pouches; snus.

ZUSAMMENFASSUNG

Im Vergleich zum Zigarettenrauchen wird der ausschließliche Konsum von schwedischem Snus mit einer Reduzierung der damit assoziierten gesundheitlichen Risiken in Verbindung gebracht. Ähnlich wie bei schwedischem Snus, jedoch ohne Tabak, handelt es sich bei modernen oralen Nikotinbeuteln um rauchlose Nikotinerzeugnisse mit dem Potenzial, die mit dem Tabakkonsum assoziierten Risiken ähnlich oder stärker zu reduzieren. Derzeit ist wenig über die Verbreitung dieser Erzeugnisse in den etablierten Märkten für schwedischen Snus bekannt. Im Rahmen einer deskriptiven Studie wurden im Jahr 2019 zwei Marktforschungsumfragen bei Personen im Alter zwischen 18 und 64 Jahren in Schweden ($n = 7003$; männlich, 51,1%) und Dänemark ($n = 4402$; männlich, 50,5%) zum Gebrauch

*Received: 30th November 2022 – accepted: 6th June 2023

dieser oralen Tabak- und Nikotinprodukte durchgeführt, um grundlegende demographische Daten sowie den durchschnittlichen täglichen Konsum von Nikotinerzeugnissen zum oralen Gebrauch zu erheben. In Schweden gaben 18,5% der Befragten an, dass sie derzeit orale Produkte verwendeten (17,1% Snus; 1,4% Nikotinbeutel), während nur 11,0% Zigaretten rauchten. Im Gegensatz dazu antworteten in Dänemark 20,5% der Befragten, dass sie derzeit Zigaretten konsumierten, während 3,2% orale Produkte verwendeten (0,8% Snus; 2,4% Nikotinbeutel). In beiden Ländern berichteten mehr Männer als Frauen, dass sie orale Erzeugnisse konsumierten, und die Mehrheit der Nutzer oraler Produkte war jünger als 45 Jahre. Der durchschnittliche tägliche Konsum lag für alle oralen Produkte bei 11,1 Beutel pro Tag in Schweden und lediglich 5,6 Beutel pro Tag in Dänemark, obwohl dort der Gebrauch von Nikotinbeuteln generell überwog. Zusammenfassend lässt sich feststellen, dass in Schweden Snus weiterhin den größten Teil des Konsums von Tabak- und Nikotinprodukten zum oralen Gebrauch ausmacht. In Dänemark übertrifft der Konsum von Nikotinbeuteln mittlerweile den von Snus (2,4% gegenüber 0,8%). Tabakkonsumenten könnten durch einen Wechsel zu Nikotinbeuteln ihr gesundheitliches Risiko, im Vergleich zum fortgesetzten Konsum von Tabakerzeugnissen, potenziell reduzieren. Ebenso können Nikotinbeutel insgesamt zu einer Verringerung der schädlichen Wirkung von Tabak in der Bevölkerung beitragen. [Contrib. Tob. Nicotine Res. 34 (2025) 34–39]

RESUME

Comparativement à la cigarette, le snus suédois, consommé de façon exclusive, est assimilé à une réduction des risques associés pour la santé. Présentant des similitudes avec le snus suédois sans toutefois contenir du tabac, les versions modernes des sachets de nicotine à absorber par voie orale sont des produits de nicotine sans combustion qui présentent potentiellement l'avantage d'atténuer, de façon similaire, voire plus importante, les risques liés au tabagisme. Actuellement, peu d'informations sont disponibles quant à la prévalence de l'usage de ces produits sur les marchés où la consommation de snus suédois est établie. La présente étude descriptive s'appuie sur deux relevés d'étude de marché réalisés en 2019 parmi un échantillon de personnes âgées de 18 à 64 ans en Suède ($n = 7003$; hommes, 51,1%) et au Danemark ($n = 4402$, hommes, 50,5%), interrogées sur la consommation de ces produits de tabac et de nicotine par voie orale; le but était d'analyser la démographie de base de ces consommateurs et la consommation quotidienne moyenne des produits de nicotine à absorber par voie orale. En Suède, 18,5% des personnes sondées firent état d'un usage actuel de produits à absorber par voie orale (17,1% prenaient du snus; 1,4% consommaient des sachets de nicotine), tandis que seulement 11,0% déclarèrent fumer des cigarettes. Au Danemark, en revanche, 20,5% des personnes interrogées firent état d'une consommation actuelle de cigarettes, tandis que 3,2% affirmèrent consommer des produits par voie orale (0,8% prenaient du snus; 2,4% prenaient des sachets de nicotine). Dans les deux pays sondés, plus d'hommes que de femmes

reconnurent consommer des produits à absorber par voie orale et la plupart des consommateurs de produits à absorber par voie orale étaient âgés de moins de 45 ans. La consommation quotidienne moyenne de la totalité des produits par voie orale pointait à 11,1 sachets/jour en Suède pour seulement 5,6 sachets/jour au Danemark, où la consommation de sachets de nicotine domine. En résumé, le snus suédois demeure le principal produit de tabac ou de nicotine à absorber par voie orale consommé en Suède tandis que la consommation de sachets de nicotine dépasse celle du snus (2,4% contre 0,8%) au Danemark. Si les consommateurs de tabac optent pour les sachets de nicotine, ils peuvent potentiellement atténuer les risques auxquels ils exposent leur santé en comparaison des risques encourus lors d'un usage prolongé des produits de tabac. Les sachets de nicotine peuvent également contribuer à réduire les effets nocifs du tabac sur l'ensemble de la population. [Contrib. Tob. Nicotine Res. 34 (2025) 34–39]

INTRODUCTION

Most smoking-related diseases are caused by the toxicants inhaled from the combusted tobacco smoke (1, 2), rather than by nicotine, which is generally considered relatively safe at the doses obtained through using tobacco and nicotine products (3, 4). The concept of tobacco harm reduction through switching from smoking cigarettes to using tobacco and/or nicotine products with fewer health risks could play an important role in reducing the health burden of tobacco use (5). Several epidemiological studies have provided evidence supporting the “Swedish experience” in tobacco harm reduction (6–11), whereby Sweden has progressed to one of the lowest rates of tobacco-related mortality in Europe (12), although its overall prevalence of tobacco product use is similar to that in many other European countries (11). This seeming paradox is due to the fact that the majority of tobacco consumers in Sweden use “snus”, a traditional moist oral smokeless tobacco product, rather than conventional cigarettes¹ (11, 13, 14). The reduced health risks from Swedish snus are chiefly due to the reduction in toxicants generated from tobacco combustion and several representative Swedish snus products have been recognized as offering reduced risk as compared to cigarettes by the U.S. Food and Drug Administration (FDA) *via* its Modified Risk Tobacco Product (MRTP) pathway (15).

Despite its reduced health risks, snus still contains tobacco and therefore varying levels of carcinogenic nitrosamines and other toxicants (16, 17). Furthermore, it has not been proven to promote smoking cessation (18). Thus, a cleaner nicotine delivery system that can satiate nicotine craving and promote smoking cessation might lead to improved tobacco harm reduction. Modern oral nicotine pouches are smokeless products that are similar in size and appearance to portion snus, but they contain no tobacco. Again similar to snus, the pouches are placed against the gum and deliver nicotine through the oral mucosa. With no tobacco or combustion, however, nicotine pouches are expected to

¹ Snus is legal in Sweden, whereas it is illegal in Denmark.

have lower levels of toxicants and thus fewer health risks as compared with snus (19).

Modern oral nicotine pouches have been commercially available in some countries since 2015, and awareness of their availability is growing among adult consumers. In particular, they may offer an alternative way to use nicotine for adults seeking alternatives to conventional cigarettes. Although these products have been marketed for five years and are increasing in popularity, few data have been published on levels of consumption among tobacco and nicotine users. The objective of this study was therefore to gather initial data on the use prevalence and average daily consumption of nicotine pouches in relation to traditional tobacco product use in Sweden and Denmark, two countries with an established snus market.

METHOD

This survey was conducted by Kantar, a market research company based in India, using Computer-Assisted Telephone Interviewing (CATI). Consent for participation was obtained from all respondents.

The surveys were designed to collect market information on the use of tobacco and nicotine products, including snus, nicotine pouches and factory-made cigarettes (FMCs). Snus is a traditional product that has been used in Denmark and especially in Sweden since the 1800s, with modifications in product design and manufacture since then. It comprises ground tobacco, either contained in a pouch or used loose, and is placed under the top lip against the gum, where the nicotine released is absorbed through the oral mucosa. Nicotine pouches are modern tobacco-free products that have been commercially available in both countries since 2016. They are similar in use and appearance to snus; for example, Lyft (BAT) comprises a pouch manufactured from permeable viscose fibres that contains a matrix composed of water and microcrystalline cellulose derived from pine fibres. The matrix incorporates food-grade standard ingredients, including a pH buffer, stabilising agent, salt, sweeteners, flavourings and pharmaceutical-grade nicotine derived from tobacco (Figure 1).

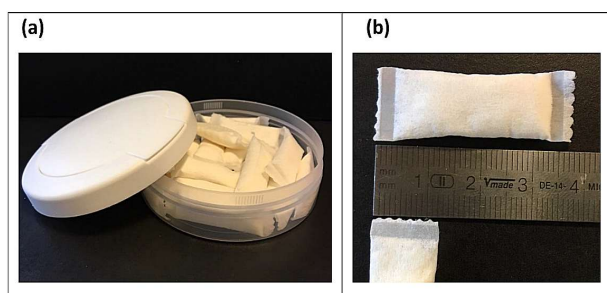


Figure 1. Modern oral products.

For the Swedish survey, a representative sample of 7003 participants aged 18–64 years were surveyed between March 21 and June 15, 2019. For the Danish survey, a representative sample of 4402 participants aged 18–64 years were surveyed between January 1 and March 31,

2019. Fixed line numbers (from a phone book) and mobile numbers (from an R&D Database) were randomly selected. Regional quotas were set to obtain a nationally representative sample. Call back was done for those who did not answer the phone, and for those who requested a call back to complete the survey at a more convenient time.

Via a fixed script, the interviewer collected basic socio-demographic data including age, gender, region, educational level and employment status. The respondents were then asked which of a number of tobacco and nicotine products they had used in the past 30 days (FMC, roll-your-own cigarettes, cigars, shisha, pipe tobacco, chewing tobacco, snus, none of these). If they responded with yes to FMC and/or snus use, they were asked a series of questions on their frequency of using these products, including All-White snus (i.e., nicotine pouches); for each product, the answers were: less than once per month; at least once per month; at least once per week; or at least once per day. Depending on their answer, they were asked then how many times per month/week/day they used the product, and also how many units they used per month/day/week. The computer-based survey prompted for an answer to each question; thus, there were no missing data in the completed surveys. The surveys took 6–15 minutes to complete. The data were reported as simple statistics (e.g., means and frequencies) after weighting for adult population proportion using interlock weights across age, gender and region. The software program used was Explorer, a standard cross-tabulation application used in market research.

RESULTS

The demographic characteristics of the respondents who took part in the Swedish and Danish surveys are summarized by type of nicotine and tobacco product use in Table 1. Because the percentage of nicotine pouch use in the two populations was relatively low (see below), snus and nicotine pouches were grouped together as “oral products”. For both surveys, participants were recruited from all regions of Denmark (Hovedstaden Midtjylland, Nordjylland, Sjælland and Syddanmark) and Sweden (Gotaland, Norrland and Svealand) to obtain a representative sample of the general population (data not shown). Regarding the demographics, approximately 50% of the respondents were female in both countries, most were older than 45 years in both Denmark (43.5%) and Sweden (41.6%), and a majority had higher or university education (52.0% in Denmark; 51.9% in Sweden) (Table 1). In terms of the demographics of product use, in Sweden 77.2% of oral product users were male and 22.8% were female, whereas the male/female ratio among FMC users was relatively even (50.9% vs. 49.1%). The ratio of male to female users of oral products in Denmark (78.6% and 21.4%, respectively) was similar to that in Sweden. In Denmark, slightly more men than women smoked FMCs (56.2% vs. 43.8%, respectively). Overall, oral product users were younger than FMC users: 92.5% of oral product users in Denmark and 69.7% in Sweden were younger than 45 years, while approximately two-thirds of FMC users were in this age category in Denmark (63.3%) and Sweden (66.6%).

Table 1. Demographic characteristics of the Danish and Swedish survey populations.

Denmark					Sweden				
Characteristic	Study pop.	Snus/NP users	FMC users	All users	Characteristic	Study pop.	Snus/NP users	FMC users	All users
Total number	4402	97	834	931	Total number	7003	1219	709	1882
<i>Gender</i>					<i>Gender</i>				
Male	50.5%	78.6%	56.2%	58.53%	Male	51.1%	77.2%	50.9%	67.1%
Female	49.5%	21.4%	43.8%	41.47%	Female	48.9%	22.8%	49.1%	32.9%
<i>Age group, year</i>					<i>Age group, year</i>				
18–29	26.4%	78.3%	37.6%	41.84%	18–29	25.9%	31.9%	40.4%	33.2%
30–44	30.0%	14.2%	25.7%	24.50%	30–44	32.6%	37.8%	26.2%	33.7%
≥ 45	43.5%	7.5%	36.7%	33.66%	≥ 45	41.6%	30.2%	33.4%	33.1%
<i>Education level</i>					<i>Education level</i>				
Primary year 1–7	0.5%	1.8%	1.0%	1.08%	Compulsory school	6.2%	6.7%	9.2%	7.6%
Primary year 8–10	9.1%	18.1%	15.0%	15.32%	Upper secondary school	41.4%	51.5%	54.1%	51.1%
Intermediate	1.7%	4.1%	1.9%	2.13%	College – no degree	7.5%	8.3%	9.0%	8.8%
Upper secondary	15.2%	38.9%	19.6%	21.61%	University – degree	44.4%	32.8%	27.1%	31.8%
Vocational training	20.7%	18.8%	25.3%	24.62%	No answer	0.2%	0.2%	0.3%	0.2%
Higher (< 3 y)	7.9%	2.9%	7.3%	6.84%					
Higher (3–5 y)	27.9%	9.7%	19.0%	18.03%					
Higher (> 5 y)	16.2%	5.8%	9.9%	9.47%					
No answer	0.7%	–	1.0%	0.90%					
<i>Employment</i>					<i>Employment</i>				
Employed full time	58.2%	52.2%	43.6%	44.50%	Employed full time	63.2%	68.3%	58.4%	64.5%
Employed part time	9.0%	9.1%	3.3%	3.90%	Employed part time	10.9%	8.2%	12.3%	9.5%
House-wife/husband	7.5%	7.4%	7.0%	7.04%	House-wife/husband	0.2%	0.1%	–	0.0%
Unemployed	13.5%	16.3%	42.5%	39.77%	Unemployed	4.5%	3.7%	6.4%	4.9%
Retired	0.8%	1.4%	–	0.15%	Retired	3.7%	2.1%	4.4%	3.5%
Self-employed	5.3%	6.9%	1.6%	2.15%	Self-employed	5.6%	5.6%	3.8%	5.1%
Student	4.5%	5.5%	1.0%	1.47%	Student	11.7%	11.9%	14.7%	12.4%
Other	1.1%	1.2%	0.9%	0.93%	Refused to answer	0.3%	0.1%	–	0.1%

NP: nicotine pouch; FMC: factory-made-cigarettes.

Regarding highest educational level attained, 38.9% of oral product users were educated to upper secondary level in Denmark, while a majority of FMC users (25.3%) were vocationally trained. In Sweden, the majority of oral tobacco (51.5%) and FMC (54.1%) users were educated to upper secondary school level. Both in Sweden and in Denmark, most oral product users (68.3% and 43.6%, respectively) and FMC (58.4% and 52.2%, respectively) were employed. Demographics (Table 1) show that unemployment rate in the Danish cohort was significantly higher in comparison to the Swedish cohort. This indicates that there are some differences between the cohorts due to the established relationship between Social Economic Status and smoking. The prevalence of tobacco and nicotine product use for all product categories, including snus, nicotine pouches and FMC, together with the mean ADC reported by users in Sweden and Denmark in 2019, are summarized in Table 2.

In Sweden, 28.5% of respondents reported using at least one of the products. More individuals reported using oral products (18.5%) than FMC (11.0%). Among those using oral products, 17.1% reported using traditional snus and 1.4% reported using nicotine pouches. In Denmark, 26.0% of participants reported using at least one of the products.

In contrast to Sweden, 20.5% of participants reported using FMCs, while only 3.2% reported using oral products. Furthermore, among the oral product users, only 0.8% reported using traditional snus while 2.4% reported using nicotine pouches.

The ADC of product use differed substantially between Sweden and Denmark. The ADC for oral products was almost twice as high in Sweden (11.1 pouches/day) than in Denmark (5.6 pouches/day); by contrast, the ADC for FMCs was higher in Denmark (10.7 cigarettes/day) than in Sweden (7.0 cigarettes/day).

DISCUSSION AND CONCLUSION

Two surveys of the adult population in Sweden and Denmark have been conducted to estimate the prevalence and consumption patterns of nicotine and tobacco use, including nicotine pouches, traditional snus and FMCs. The surveys show that oral products account for most tobacco and nicotine use in Sweden, whereas cigarette smoking is more prevalent than oral product use in Denmark. Among oral product users, nicotine pouch use has surpassed snus use in Denmark (2.4% vs. 0.8% of the survey population),

Table 2. Incidence and average daily consumption (ADC) of tobacco and nicotine product use in Sweden and Denmark in 2019.^a

Product	Sweden (n = 7003)		Denmark (n = 4402)	
	Users (%)	ADC (units/day)	Users (%)	ADC (units/day)
Oral nicotine product use	18.6	11.1	3.2	5.6
Snus	17.1	11.3	0.8	–
Nicotine pouches	1.4	8.3	2.4	–
FMC	11.0	7.0	20.5	10.7
Total nicotine product use	28.5		26.0	

^a Among 18–64-year-olds who completed a telephone survey. FMC: factory-made-cigarettes.

while traditional snus is more popular than nicotine pouches in Sweden (17.1% vs. 1.4% of the survey population). In a recent review funded by Imperial Tobacco, CLARKE *et al.* (11) reported that the prevalence of oral tobacco use was 20% in Sweden and that more men than women use snus, consistent with the current findings. They also reported that the consumption of cigarettes has been declining since the mid-twentieth century in Sweden, while the use of snus has correspondingly increased (11). Alongside the decline in cigarette smoking, Sweden has the lowest incidence of tobacco-related disease in Europe (12), supporting the role of snus in tobacco harm reduction. Indeed, an expert panel estimated that Swedish snus use confers a 90% reduction in health risk relative to cigarette smoking (20). As a result, nicotine pouches, which contain pharmaceutical-grade nicotine and no tobacco, may offer the potential for a further contribution to tobacco harm reduction. In support of this, a recent study has shown that the toxicant content of nicotine pouches is substantially reduced as compared with snus (19). To be successful as a satisfactory alternative to traditional tobacco products, alternative products must deliver nicotine in a timely manner (21). A pharmacokinetic study has shown that nicotine pouches deliver nicotine in a pharmacokinetic profile similar to that of snus (22), while a preliminary survey in the United States found that former smokeless tobacco product (STP) users comprise the highest percentage of nicotine pouch users (23); thus, initial data suggest that nicotine pouches may satisfy tobacco users' desire for nicotine. Our preliminary data on the ADC of oral tobacco and nicotine products suggests that the behaviour of consumers using nicotine pouches may differ from that of traditional snus users. In Sweden, the ADC was reported as 8.3 pouches/day for nicotine pouches as compared with 11.3 pouches/day for snus. In Denmark, where the majority of oral product users were nicotine pouch users, the ADC of all oral products was only 5.6 pouches/day. Because nicotine content varies in different brands of snus and nicotine pouches, it is not clear whether the lower ADC observed among nicotine pouches users in the present study translates into more efficient nicotine delivery and/or lower user exposure; further studies are warranted in this

regard. Due to a range of oral nicotine pouches available on the market, of which they contain an array of constituents and nicotine levels (1.79–47.5 mg/pouch) the products may also contain ranging values of tobacco-specific nitrosamines (TSNAs) levels. TSNAs are recognised by the World Health Organisation as a group of potentially harmful constituents found in traditional cigarettes, that are significantly reduced for oral nicotine pouches.

The study has some limitations. First, the Computer-Assisted Telephone Interviewing (CATI) survey method used for market research is limited by sampling and respondent availability; some populations are less likely to respond to telephone questionnaires. Second, because the survey method follows a fixed script, respondents cannot be probed by an interviewer, which may lead to less reliable data. Last, in this type of survey, the collected data are subject to measurement, processing, non-response and sampling error.

This brief survey of oral product use indicates that traditional snus continues to account for most oral product use in Sweden, but nicotine pouch use is higher than snus use in Denmark, suggesting that nicotine pouches use may be increasing. It will be important to determine whether the nicotine pouch users in Denmark have switched from using snus or FMCs or are new users. Further systematic studies are also required to establish the mouth-hold times, the frequency and pattern of use, and the amount of nicotine transferred from nicotine pouches to users as compared with traditional snus. While the data shows that nicotine pouch use in Denmark is more common than the use of tobacco based oral products, this is likely due to tobacco based oral products (snus) is banned in Denmark, unlike in Sweden.

CONFLICTS OF INTEREST

The authors were full-time employees of BAT (Investments) Ltd at the time of the study.

FUNDING

The study was fully funded by BAT.

AUTHOR CONTRIBUTIONS

Krishna Prasad was responsible for the collation of relevant data, analysing the results and drafting the paper. Lauren Edward was responsible for data checking and drafting and editing the paper.

ACKNOWLEDGMENTS

The authors thank Oleksii Sazonov for compiling the results from the studies in Sweden and Denmark, and Susthita Dhar and Maria Pantina in Kantar for invaluable contributions.

REFERENCES

1. U.S. Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion, and Office on Smoking and Health: The Health Consequences of Smoking – 50 Years of Progress: A Report of the Surgeon General; DHHS, Atlanta, GA, USA, 2014. Available at: <https://pubmed.ncbi.nlm.nih.gov/24455788/> (accessed July, 2023).
2. Gottlieb, S.: Protecting American Families: Comprehensive Approach to Nicotine and Tobacco; Speech by Scott Gottlieb, FDA, White Oak, MD, USA, 28 June 2017. Available at: <https://www.fda.gov/news-events/speeches-fda-officials/protecting-american-families-comprehensive-approach-nicotine-and-tobacco-06282017> (accessed July, 2023)
3. Royal College of Physicians: Nicotine without Smoke: Tobacco Harm Reduction; RCP, London, UK, 2016. Available at: <http://www.rcplondon.ac.uk/projects/outputs/nicotine-without-smoke-tobacco-harm-reduction> (accessed July, 2023)
4. Public Health England: Health Matters: Stopping Smoking – What Works?; Public Health England, London, UK, 2016. Available at: <https://www.gov.uk/government/publications/health-matters-stopping-smoking-what-works/health-matters-stopping-smoking-what-works> (accessed July, 2023)
5. Institute of Medicine (U.S.) Committee to Assess the Science Base for Tobacco Harm Reduction: Clearing the Smoke: Assessing the Science Base for Tobacco Harm Reduction; edited by K. Stratton, P. Shetty, R. Wallace, and S. Bondurant, National Academies Press Washington, DC, USA, 2001. DOI: 10.17226/10029
6. Foulds, J., L. Ramstrom, M. Burke, and K. Fagerström: Effect of Smokeless Tobacco (Snus) on Smoking and Public Health in Sweden; *Tob. Control* 12 (2003) 349–359. DOI: 10.1136/tc.12.4.349
7. Gartner, C.E., W.D. Hall, T. Vos, M.Y. Bertram, A.L. Wallace, and S.S. Lim: Assessment of Swedish Snus for Tobacco Harm Reduction: An Epidemiological Modelling Study; *Lancet* 369 (2007) 2010–2014. DOI: 10.1016/S0140-6736(07)60677-1
8. Environ: Review of the Scientific Literature on Snus; Environ, Arlington, VA, USA, 2010. Available at: <https://www.swedishmatch.com/globalassets/documents/other/environ-review-of-the-scientific-literature-on-snus-3-31-10.pdf> (accessed July, 2023)
9. Lee, P.N.: The Effect on Health of Switching from Cigarettes to Snus – A Review; *Regul. Toxicol. Pharmacol.* 66 (2013) 1–5. DOI: 10.1016/j.yrtph.2013.02.010
10. Ramboll: Systematic Review and Update of the Literature on the Health Effects of Swedish Snus; Ramboll, Arlington, VA, USA, 2019. Available at: http://www.swedishmatch.com/globalassets/documents/other/ramboll-health-effects-update-report_20190513.pdf (accessed July, 2023).
11. Clarke, E., K. Thompson, S. Weaver, J. Thompson, and G. O’Connell: Snus: A Compelling Harm Reduction Alternative to Cigarettes; *Harm Reduct. J.* 16 (2019) 62. DOI: 10.1186/s12954-019-0335-1
12. Ferlay, J., E. Steliarova-Foucher, J. Lortet-Tieulent, S. Rosso, J.W. Coebergh, H. Comber, D. Forman, and F. Bray: Cancer Incidence and Mortality Patterns in Europe: Estimates for 40 Countries in 2012; *Eur. J. Cancer*, 49 (2013) 1374–1403. DOI: 10.1016/j.ejca.2012.12.027
13. European Commission: Special Eurobarometer 458. Attitudes of Europeans Towards Tobacco and Electronic Cigarettes; 2017. Available at: <http://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/2146> (accessed July, 2023)
14. World Health Organization (WHO): European Tobacco Use: Trends Report 2019; WHO, Regional Office for Europe, Copenhagen, DK. Available at: <https://apps.who.int/iris/handle/10665/346817> (accessed July, 2023)
15. U.S. Federal Food and Drug Association (FDA): FDA Grants First-Ever Modified Risk Orders to Eight Smokeless Tobacco Products; FDA, Silver Spring, MD, USA, 2019. Available at: <https://www.fda.gov/news-events/press-announcements/fda-grants-first-ever-modified-risk-orders-eight-smokeless-tobacco-products> (accessed July, 2023)
16. Song, M.A., C. Marian, T.M. Brasky, S. Reisinger, M. Djordjevic, and P.G. Shields: Chemical and Toxicological Characteristics of Conventional and Low-TSNA Moist Snuff Tobacco Products; *Toxicol. Lett.* 245 (2016) 68–77. DOI: 10.1016/j.toxlet.2016.01.012
17. Lawler, T.S., S.B. Stanfill, H.T. Tran, G.E. Lee, P.X. Chen, J.B. Kimbrell, J.G. Lisko, C. Fernandez, S.P. Caudill, B.R. deCastro, and C.H. Watson: Chemical Analysis of Snus Products from the United States and Northern Europe; *PLoS One* 15 (2020) e0227837. DOI: 10.1371/journal.pone.0227837
18. Benowitz, N.L.: Emerging Nicotine Delivery Products. Implications for Public Health; *Ann. Am. Thorac. Soc.* 11 (2014) 231–235. DOI: 10.1513/AnnalsATS.201312-433PS
19. Azzopardi, D., C. Lui, and J. Murphy: Chemical Characterisation of Tobacco-Free “Modern” Oral Nicotine Pouches and their Position on the Toxicant and Risk Continuums; *BMC Chem.* 45 (2021) 2246–2254. DOI: 10.1080/01480545.2021.1925691
20. Levy, D.T., E.A. Mumford, K.M. Cummings, E.A. Gilpin, G. Giovino, A. Hyland, D. Sweanor, and K.E. Warner: The Relative Risks of a Low-Nitrosamine Smokeless Tobacco Product Compared with Smoking Cigarettes: Estimates of a Panel of Experts; *Cancer Epidemiol. Biomarkers Prev.* 13 (2004) 2035–2042.
21. Benowitz, N.L.: Nicotine Addiction; *New Engl. J. Med.* 362 (2010) 2295–2303. DOI: 10.1056/NEJMra0809890
22. Lunell, E., K. Fagerström, J. Hughes, and R. Pendrill: Pharmacokinetic Comparison of a Novel Non-Tobacco-Based Nicotine Pouch (ZYN) with Conventional, Tobacco-Based Swedish Snus and American Moist Snuff; *Nicotine Tob. Res.* 22 (2020) 1757–1763. DOI: 10.1093/ntr/ntaa068
23. Plurphanswat, N., J.R. Hughes, K. Fagerström, and B. Rodu: Initial Information on a Novel Nicotine Product; *Am. J. Addict.* 29 (2020) 279–286. DOI: 10.1111/ajad.13020

Corresponding author:

*Lauren Edward
BAT (Investments) Limited
Regents Park Road
Millbrook, Southampton SO15 8TL, UK
E-mail: Lauren_Edward@bat.com*