

# **SNUS KOMMISSIONEN**

A close-up photograph of a hand holding a black tin filled with numerous snus pouches. The pouches are light brown and rectangular, some showing a perforated texture. A white text box is overlaid on the center of the tin.

## **The health effects of snus**

## Summary

This report reviews the relevant research concerning snus and any links it may have with major and commonly occurring diseases. The report summarises the state of the research on snus and its health effects, with a focus on meta-analyses and major research studies. In other words, this report does not constitute a complete review of all available research reports.

The report concludes that there is an absence of reliable corroboration for any link between snus and cancer. The report also finds that any link between tooth loss and other oral ill health and the consumption of snus cannot be substantiated. Nor does the consumption of snus affect the risk of cardiovascular disease.

The report also discusses snus' potential as a smoking cessation tool. We conclude that e.g. the US FDA recommends introducing Swedish snus in the US, since Swedish snus has the potential to mitigate the adverse health effects of other types of tobacco use. Ill health is reduced when an individual transitions from being a smoker to using snus.

The potential of snus to minimise harm can also be regarded from a European perspective. There is no other country that consumes as much snus as Sweden – nor is there any other country where there percentage of tobacco-related ill health is as low as it is here.

*The Snus Commission*

*Stockholm 10 May 2016*



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# Foreword

## **Why publish a report on the health effects of snus?**

The health effects of Swedish snus is a controversial subject. It is controversial primarily because there are so many preconceived notions about it and there is such a clear political agenda. In this report, we hope to address some misunderstandings and thereby add to a more fact-based and reasoned debate. This will thus also serve as input for the political system and the decision-making processes that are under way regarding tobacco.

## **About the Snus Commission**

The Snus Commission is an independent commission that will produce reports on matters related to Swedish snus. The Commission is financed by the Swedish Association of Snus Manufacturers – a coalition of companies in Sweden that manufacture, market and sell snus. However, since the Commission's conclusions are independent of its financiers, said financiers were not able to attend meetings or provide feedback on the contents of the report either.

## The Snus Commission comprises:

Photo: P-O Rosen, Strängnäs



**Anders Milton**, Chairman of The Snus Commission. Milton is a physician whose former roles include being President and Chairman of the Swedish Medical Association, Chairman of the World Medical Association 1995 to 2001, President of the Swedish Confederation of Professional Associations from 1993 to 2001, and President of the Swedish Red Cross from 2002 to 2005. Milton has also served as the government's psychiatry coordinator, and was a member of the Catastrophe Commission following the 2004 tsunami.

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**Kinna Bellander** is a journalist and has worked at the Swedish daily *Aftonbladet*. Bellander has also held roles including CEO of the publication *Moderna Tider*, Executive Vice President of TV4 and Executive Vice President of MTG.

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**Göran Johnsson's** positions include Chairman of the IF Metall labour union from 1993 to 2005, as well as being a former member of the Social Democratic Party's Executive Committee and a board member of Volvo AB. He was the Chairman of Swedish national television broadcaster SVT from 2011 to 2014.

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**Karl Olov Fagerström**, Associate Professor and researcher on tobacco and nicotine. Fagerström was decorated by the WHO for his initiatives against tobacco. He also founded a company that sells smoking cessation products and has held positions at Pharmacia.

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## Background and framing of the issue

The government is proposing the implementation of comprehensive regulations governing snus. The far-reaching proposals from such parties as the government's own investigator include a visual display ban, a ban on advertising flavours and scents on the packages and detailed regulations governing how many portion pouches each can must contain. These regulations are being justified by invoking sweeping public health reasons including a need to reduce the general consumption of tobacco. At the same time as health claims are being used as reasons for reducing the consumption of snus, extensive requirements are being imposed on the reporting of additives and ingredients with the justification that not enough is known about the health effects of snus.

Sweden's government is working against itself. These regulations are being driven by ideology, with no clear factual basis. The think tank, Tobaksfakta, has also introduced a number of proposals to regulate and limit snus – while also itself acknowledging the lack of a sufficient factual basis. Tobaksfakta is calling for facts to support the conclusions that the think tank itself has delivered. Managing to prove that snus has similar health effects to cigarettes is “a key research task”<sup>1</sup> according to Tobaksfakta. If the research fails to provide the answers that you're looking for, you simply order more research.

Instead of blindly implementing regulations, the debate should be focused on the

facts. What effects does snus have? What do we know and what are the myths in the debate? The Commission behind this report wants to put the facts on the table. Research and greater enlightenment are positive features. Yet we must also operate within the framework of the factual data that is already available – both when it demonstrates health effects related to snus and when it doesn't. There are several hundred research reports and studies on snus. There is no shortage of facts. What is missing is a public health lobby and a government that reads and assimilates the facts that are on the table.

In this report, we will review the existing research and discuss cases of claims of adverse health links to snus – while also highlighting a few cases where snus has proven to have distinct positive health effects.

This report compiles and refers to research reports with an emphasis on results from Swedish research teams. Since snus is a predominantly Swedish phenomenon, research on the health effects of snus has also often been conducted with the support of public funding, particularly from the Public Health Agency of Sweden. Yet this report also refers to research from countries including Australia, the US, Serbia and India, mainly in the cases in which research based on a Swedish context was lacking, or when the findings were of particular interest for other reasons. We have also placed our emphasis on topical research that was recently conducted. In certain cases, older reports were also included, particularly in the absence of more recent research in the same field, or in the absence of studies of the same or similar positions.

<sup>1</sup> Tobaksfakta (23 January 2014) <http://tobaksfakta.se/wp-content/uploads/2014/01/Om-snusset.jan20141.pdf>

From among these materials, we have not seen a need to conduct a complete review of the hundreds of studies that are available on snus. Instead, the Snus Commission has elected to use relevant studies – preferably of a general nature – that above all highlight potential links with major and commonly occurring diseases. The report addresses some of the most commonly claimed health issues linked to snus. For instance, both cancer and diabetes are addressed. The link between oral health and snus is also described within the framework of this report, since this is an area that is especially prone to misunderstandings or even myths. This demarcation captures a substantial number of the studies that have been conducted on snus and health effects, without claiming to serve as a complete compilation that covers all existing research.

## How do we research snus?

The first question to discuss is what has actually been studied and how this research has been referenced in the general debate. Upon closer examination, it often turns out that the research pertained to something other than Swedish snus, that underlying factors were omitted or that the research pertained to something other than normal consumption.

### **Swedish snus is a unique product that distinguishes itself from other forms of smokeless tobacco**

In international studies, snus is often classified in the same group as other forms of smokeless tobacco. This results in studies not taking into account the specific



properties of Swedish snus. Just because two products have been assigned a similar designation and been placed in the same category doesn't mean that they have the same or even similar properties. Smokeless tobacco – a category under which Swedish snus is one of several available products – can differ drastically both in terms of how it is consumed and what it contains. In the next phase, this has a clear impact on which health effects each product has. This is also the conclusion of the FDA – the US food and drug administration – which believes that Swedish snus is clearly distinct from other smokeless tobacco products<sup>2</sup>.

The most important distinction between Swedish snus and other types of smokeless tobacco is that the Swedish snus is pasteurised during the manufacturing process, meaning that it is heated. The snus is subsequently cooled. The fact that the snus is heated drastically reduces the quantity of nitrosamines, which is a substantial factor behind the fact the Swedish snus does not at all have the same types of health effects as other smokeless tobacco products that are used orally. Here, the manufacturing process differs sharply from how many other types of smokeless tobacco are manufactured. In terms of smokeless tobacco from other regions of the world, fermentation is not uncommon, yet this process is not in fact used on Swedish snus. The quantity of nitrosamines is also affected by which cultivation methods are used. Nitrosamines are compounds that are also found in, for example, potatoes and many other crops. From a health perspective, it is

the handling process that is decisive.

In countries like India, where at least 150 million people use smokeless tobacco orally, cancer of the oral cavity is a common form of cancer. Drawing conclusions from research on this type of tobacco and how it is consumed in India is interesting and important in gaining an understanding of the situation in India, but it says nothing at all about the effects of Swedish snus since it is a completely different product. When Indian researchers – based on a study of the Indian population – claim that there is a correlation between smokeless tobacco and oral cavity and oropharyngeal cancer<sup>3</sup>, this could therefore potentially be saying something about the situation in India and about the type of smokeless tobacco that is consumed there, depending on the quality of the study. However, it is very difficult to draw conclusions from the same study about snus in Sweden.

Another example is American chewing tobacco, which is not uncommon in the US. Chewing tobacco is a completely different type of tobacco product than Swedish snus, and is thus not comparable. Versions of snus other than Swedish snus are available and have been available in, for example, the US and Norway. Swedish snus has now been introduced in Norway, yet a substantial share of the research on snus that has been conducted there has been conducted on their particular version, known as Skrå, which differs from Swedish snus both in terms of ingredients and the manufacturing process. Accordingly, it

<sup>2</sup>Presentation by Li-Lun Chen, M.D. Director of Individual Health Science at FDA (US Food and Drug Administration), March 2, 2016, Chicago, ILL. Society for research on nicotine and tobacco.

<sup>3</sup>Dhirendra N. Sinha, Rizwan Suliankatchi Abdulkader, and Prakash C. Gupta (2016): Smokeless tobacco-associated cancers: A systematic review and meta-analysis of Indian studies. *International Journal of Cancer*. 2016 Mar 15;138(6):1368-79



is not appropriate to draw conclusions about Swedish snus based on the research conducted on any of these versions.

### **No consideration of socioeconomic effects and other underlying factors**

When an activity like consuming snus is studied, other potential characteristics of the group of snus users being studied must be examined prior to drawing any conclusions about the snus. Individuals with unhealthy dietary habits and who do not engage in any physical activity run a higher risk in general than others of experiencing various forms of ill health. Accordingly, it is not certain that the correlation lies between the snus per se and ill health.

Despite this, research is occasionally conducted on snus usage without taking these types of underlying factors into account. There are several examples of this from a Swedish research team that has conducted several studies on tobacco and cancer, where they have also compared the differences in effects between snus users and smokers. However, the problem is that several of the studies – including one on the risk of cancer-related mortality among both smokers and snus users, and one on the risk of rectal and colon cancer – are based on a sample group that exclusively comprises construction workers who have actively signed up for health examinations<sup>4,5</sup>. It is likely that those who actively sought a health examination have in various ways experienced ill health that they would like to examine.



“These products are produced with a voluntary, proprietary manufacturing process that distinguishes Swedish snus from other types of Smokeless Tobacco, including snus-like products sold in the US market. The proprietary standard for Swedish snus products was developed to ensure product quality.”

**Presentation by Li-Lun Chen, M.D.**  
Director of Individual Health Science at FDA (US Food and Drug Administration), march 2, 2016, Chicago, ILL. Society for research on nicotine and tobacco.

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### **“Normal” consumption**

A Swedish daily user of snus consumes an average of a third of a can per day<sup>6</sup>. Yet a strikingly limited number of studies address whether or not the sample group studied consumes snus normally. Many foods can be hazardous if overconsumed. An excessive intake is not recommended whether it pertains to salt, sugar or fatty foods. Despite this, the snus in the study is often analysed without taking into consideration whether the sample group studied comprises heavy users, normal users or limited users.

<sup>4</sup> Nordvall C, Nilsson PJ, Ye W, Andersson TM, Nyrén O (2013): Tobacco use and cancer survival: A cohort study of 40,230 Swedish male construction workers with incident cancer. *International Journal of Cancer*: 132, 155-161

<sup>5</sup> Nordvall C, Nilsson PJ, Ye W, Nyrén O (2011): Smoking, snus use and risk of right- and left-sided colon, rectal and anal cancer: a 37 year follow up study. *International Journal of Cancer*. 2011 Jan 1;128(1):157-65

<sup>6</sup> Bolinder G (2012), *Läkartidningen* No 11 2012 <http://www.lakartidningen.se/Functions/OldArticleView.aspx?articleId=17936>

# The health effects of snus

In the following section, we will review snus and examine any potential links with commonly occurring diseases.

## Snus and oral health

It would be easy to presume that snus users, who place a portion pouch under their upper lip on a daily basis, would run an increased risk of various forms of afflictions in the oral cavity, where the concentration of snus is the strongest. This does not appear to be the case. A major research overview on snus and its various health effects found that using snus has no impact whatsoever on periodontitis or caries<sup>7</sup>. An epidemiological study that followed a group over the course of 20 years found that snus does not appear to be a risk factor in periodon-

titis – inflammatory diseases of the tissue surrounding and in proximity of the teeth – often referred to as the loosening of teeth. The study indicates that cigarette smokers have a statistically significantly higher risk of severe periodontitis than do individuals who use snus or who don't use tobacco at all. According to the study, using snus is not a risk factor in developing periodontitis<sup>8</sup>.

## Snus and strokes, arteriosclerosis and other cardiovascular diseases

The potential impact of snus on cardiac capacity and on cardiovascular diseases has long been studied. A study as early as in 1997 examined the link between tobacco and atherosclerosis (a form of arteriosclerosis)<sup>9</sup>. The study was limited to middle-aged men and was unable to find any statistical significance between atherosclerosis and the use of smokeless tobacco, like Swedish snus.

A few years later, a study was conducted that, among other matters, examined the link between cardiac capacity and the use of tobacco. The study found that cardiac capacity during physical exertion was unaffected by smokeless tobacco (snus and



“Smokeless tobacco users did not show any significant increase in intima media thickness as compared to never-users in spite of exposure to smokeless tobacco for more than 20 years”

**Bolinder G, Norén A, de Faire U, Wahren J (1997): Smokeless tobacco use and atherosclerosis: an ultrasonographic investigation of carotid intima media thickness in healthy middle-aged men.**

<sup>7</sup> Lee, Peter N. (2013): Epidemiological evidence relating snus to health – an updated review based on recent publications. *Harm Reduct J.* 2013; 10: 36.

<sup>8</sup> Hugosson A, Rolandsson M (2011): Periodontal disease in relation to smoking and the use of Swedish snus: Epidemiological studies covering 20 years (1983-2003). *Journal of Clinical Periodontology.* 2011 Sep;38(9):809-16

<sup>9</sup> Bolinder G, Norén A, de Faire U, Wahren J (1997): Smokeless tobacco use and atherosclerosis: an ultrasonographic investigation of carotid intima media thickness in healthy middle-aged men. *Atherosclerosis* 132 (1997) 95-103

chewing tobacco)<sup>10</sup>. An overview article summarising studies in the field also found that users of smokeless tobacco generally do not experience the biochemical effect that regular smokers experience<sup>11</sup>.

One affliction that snus could possibly have a certain link with is metabolic syndrome (MetSy). Metabolic syndrome is not a disease per se, but rather a collective term for a variety of types of cardiovascular risks. A study that examined environmental factors that may be an underlying factor in metabolic syndrome found a link between snus and certain components of metabolic syndrome (e.g. triglycerides and obesity), yet at the same time, any link with other components (e.g. high blood pressure) appeared to be missing. The study was conducted so as to invite all residents aged 30, 40, 50 and 60 in Västerbotten County to participate in a survey-based health examination. The analysis was adjusted for age, gender, alcohol consumption and family history of diabetes and cardiovascular diseases. However, this study also concluded that “more research is needed to better understand the mechanisms underlying this effect”, and it is naturally possible that there are other underlying environmental factors that were overlooked in the study<sup>12</sup>.

A recently published study examined a potential link between snus and the risk of atrial fibrillation (AF). Some 274,882



“Two studies have found that snuff users, as opposed to smokers, do not have increased intima-media thickness or atherosclerotic lesions when investigated by ultrasound.”

- Asplund, K (2003): *Smokeless Tobacco and Cardiovascular Disease*

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Swedish men were monitored for AF via the national patient registry. The primary analysis was limited to 127,907 men who had never smoked, to eliminate that background factor. The study concluded that it is unlikely that snus has any material impact on the risk of suffering from AF<sup>13</sup>.

The link between snus and myocardial infarctions has also been examined in several different reports and studies. A major study by Maria-Pia Hergens et al. examined 1,760 men in two different Swedish municipalities between the ages of 45 and 70, who had experienced myocardial infarctions between 1992 and 1994. Background information and environmental factors including BMI were gathered through questionnaires and medicinal examinations. The study was unable to support the hypothesis that snus increases the risk of myocardial infarctions<sup>14</sup>.

<sup>10</sup> Bolinder G, Norén A, Wåhnen J, De Faire U. (1997): Long-term use of smokeless tobacco and physical performance in middle-aged men. *Eur J Clin Invest.* 1997 May;27(5):427-33.

<sup>11</sup> Asplund, K (2003): *Smokeless Tobacco and Cardiovascular Disease.* Progress in Cardiovascular Diseases. Vol. 45, No. 5, (Mars/April 2003): pp 384-394

<sup>12</sup> Norberg M, Stenlund H, Lindahl B, Boman K, Weinehall L (2006): Contribution of Swedish moist snuff to the metabolic syndrome: A wolf in sheep clothing? *Scandinavian Journal of Public Health* 2006, 1-8

<sup>13</sup> Hergens MP, Galanti R, Hansson J, Fredlund P, Ahlbom A, Alfredsson L, Bellocco R, Eriksson M, Fransson EL, Hallqvist J, Jansson JH, Knutsson A, Pedersen N, Trolle Lagerros Y, Östergren PO och Magnusson C (2014): Use of Scandinavian Moist Smokeless tobacco (Snus) and the Risk of Atrial Fibrillation. *Epidemiology.* 2014 Nov;25(6):872-6

<sup>14</sup> Hergens MP, Ahlbom A, Andersson T, Pershagen G (2005): Swedish Moist Snuff and Myocardial Infarction Among Men. *Epidemiology.* 2005, Volume 16, Number 1

A similar study conducted at Umeå University by Fritz Huhtasaari et al. found the same results and concluded that the risk of myocardial infarctions did not increase by consuming snus. The study compared 687 cases of myocardial infarctions among men aged 25–64<sup>15</sup>.

Yet another study examined the risk of both myocardial infarctions (MI) and the risk of sudden cardiac arrest (SCD) among men who consume snus<sup>16</sup>. This study compared 525 men who had experienced myocardial infarctions (including 93 who had experienced sudden cardiac arrest) with 1,798 matching reference individuals in a control group. The study indicates that there is no increased risk of myocardial infarctions among people who consume snus and who do not have a history of having smoked, compared with people who have never either consumed snus or smoked. The results were adjusted to take into account factors including BMI, physical activity and cholesterol values. Furthermore, the study did not support the hypothesis that there is an increased risk of sudden cardiac arrest among people who consume snus. A pooled analysis<sup>17</sup> of eight different observations conducted by a considerable number of researchers also failed to find a link between the consump-



“Findings from this large national pooling project indicate that snus use is unlikely to confer any important increase in risk of atrial fibrillation.”

- Hergens MP, Galanti R, Hansson J, Fredlund P, Ahlborn A m.fl. (2014): Use of Scandinavian Moist Smokeless tobacco (Snus) and the Risk of Atrial Fibrillation

tion of snus and myocardial infarctions<sup>18</sup>. Accordingly, said study also concludes that nicotine cannot be the factor contributing to the risk of myocardial infarctions for smokers, since there is no corresponding effect for snus. In addition to these studies, which unanimously indicated that there is no link between snus and an increased risk of myocardial infarctions, we can, however, add studies that indicate that the effect of a myocardial infarctions may be somewhat worse for those who are regular consumers of snus. Following a myocardial infarction, however, the outlook is better if you stop consuming snus<sup>19</sup>.

The only study that deviates from the results indicating the absence of a link

<sup>15</sup> Huhtasaari F, Lundberg V, Eliasson M, Janlert U, Asplund K (1999): Smokeless Tobacco as a Possible Risk Factor for Myocardial Infarction: A Population-Based Study in Middle-Aged Men. *Journal of the American College of Cardiology*. Vol. 34, No. 6, 1999

<sup>16</sup> Wennberg P, Eliasson M, Hallmans G, Johansson L, Boman K och Jansson L-H (2007): The risk of myocardial infarction and sudden cardiac death amongst snuff users with or without a previous history of smoking. *Journal of Internal Medicine*.

<sup>17</sup> The term “pooled analysis” is defined as a weighted analysis based on several different existing studies

<sup>18</sup> Hansson J, Galanti MR, Hergens MP, Fredlund P, Ahlborn A, Alfredsson L, Bellocco R, Eriksson M, Hallqvist J, Hedblad B, Jansson JH, Nilsson P, Pedersen N, Trolle Lagerros Y, Östergren PO, Magnusson C (2012): Use of snus and acute myocardial infarction: pooled analysis of eight prospective observational studies. *European Journal of epidemiology*. 2012 Oct;27(10):771–9. doi: 10.1007/s10654-012-9704-8. Epub 2012 Jun 22.

<sup>19</sup> Arefalk G, Hambraeus K, Lind L, Michaëlsson K, Lindahl B, Sundström J (2014): Discontinuation of Smokeless Tobacco and Mortality Risk After Myocardial Infarction (2014). *Circulation*. 2014; 130:325–332

between myocardial infarctions and snus was conducted on construction workers. Although this study took BMI and age into account, there may be other underlying factors as to why construction workers who consume snus have a higher risk of myocardial infarctions that are not related to snus per se<sup>20</sup>. Among other things, we know that the health studies among construction workers lack a control for alcohol consumption. Furthermore, this study involved a certain subpopulation within the category of construction workers – those who actively sought a health examination.

Another study compiles the results from two different studies, one of which is based on the same fundamentals that we described above, meaning construction workers who independently and proactively sought out a health examination. This study found that there may be a link between snus and the risk of heart failure, though based on the shortcomings that we established regarding the study on construction workers, one should be cautious about drawing conclusions from this<sup>21</sup>.

As for the potential link between consuming snus and the risk of stroke, a research overview is available, including a pooled analysis, which is based on eight Swedish cohort studies<sup>22</sup>. Overall, the analysis is based on 130,485 men (none of whom had ever smoked, since smokers were removed so as to eliminate this as an

underlying factor), distributed among the eight different studies. The key conclusion is that the risk of stroke does not increase when consuming snus. Accordingly, it is unlikely that nicotine has any material pathophysiological effect in the event of a stroke<sup>23</sup>.

Generally, the alleged links between snus and cardiovascular diseases appear to be weak and unsubstantiated. The risk of myocardial infarctions is not greater for users of snus than for other individuals, and the same applies for the risk of atherosclerosis. Nor can any impact on cardiac capacity during physical exertion linked to snus be established. There may be a possible link to metabolic syndrome, though this must be



“None of the publications adjusted for job type. One would imagine that for some jobs using snus is more convenient than is smoking, and associations may reflect the risk of the job rather than of snus use.”

- Lee, Peter N. (2010): Summary of the epidemiological evidence relating snus to health. *Regulatory Toxicology and Pharmacology* 59, 197-214

<sup>20</sup> Hergens MP, Alfredsson L, Bolinder G, Lambe M, Pershagen G, Ye W (2007): Long-term use of Swedish moist snuff and the risk of myocardial infarction amongst men. *Journal of Internal Medicine* 262; 351-359.

<sup>21</sup> Arefalk G, Hergens MP, Ingelsson E, Arnlöv J, Michaëlsson K, Lind L, Ye W, Nyren O, Lambe M, Sundström J (2012): Smokeless Tobacco (snus) and risk of heart failure: results from two Swedish cohorts. *European Journal of Preventive Cardiology*. 2012 Oct;19(5):1120-7

<sup>22</sup> The term “cohort study” refers to a study on a group of individuals with a predetermined common experience within a given timeframe.

<sup>23</sup> Hansson J, Galanti MR, Hergens MP et al. (2014): Snus use and risk of stroke: pooled analyses of incidence and survival. *Journal of Internal Medicine*. Volume 276, Issue 1, pages 87–95, July 2014

further researched before any conclusions can be drawn. However, it does appear to be the case that the impact of a stroke or a myocardial infarction is somewhat greater if you in fact consume snus.

## Snus and the risk of diabetes

The widespread disease diabetes has a clear and proven link to environmental factors such as an unhealthy diet, but is there any link with snus as well? Several different studies have looked into this. The research findings seem to vary somewhat.

One study contended that a high consumption of snus increases the risk of developing type 2 diabetes<sup>24</sup>. However, this study did not find any link in the case of normal consumption either. Another study, conducted among 1,895 men who are 60 years old and live in Stockholm municipality, did not find any significant link between an increased risk of diabetes and the use of any form of tobacco, although a link cannot be entirely precluded either<sup>25</sup>. A third study examined 3,384 men aged 25 to 74 and was unable to prove any increased risk of diabetes for snus users<sup>26</sup>.

There is no reliable corroboration for any potential link between snus and diabetes, at least not in the case of a somewhat normal consumption of snus, though a link cannot be completely precluded either.

<sup>24</sup> Östensson CG, Hilding A, Grill V, Efendic S (2012): High consumption of smokeless tobacco ("snus") predicts increased risk of type 2 diabetes in a 10-year prospective study of middle-aged Swedish men. *Scandinavian Journal of Public Health*. 2012 Dec;40(8):730-7.

<sup>25</sup> Wändell PE, Bolinder G, de Faire U, Hellénus ML (2008): Association between metabolic effects and tobacco use in 60-year-old Swedish men. *European Journal of Epidemiology*. Vol. 23, No. 6 (2008), pp. 431-434

<sup>26</sup> Eliasson M, Asplund K, Nasic S, Rodu B (2004): Influence of smoking and snus on the prevalence and incidence of type 2 diabetes amongst men: the northern Sweden MONICA study. *Journal of Internal Medicine*; 256: 101-110.

<sup>27</sup> Nordenvall C, Nilsson PJ, Ye W, Andersson TM, Nyrén O (2013): Tobacco use and cancer survival: A cohort study of 40,230 Swedish male construction workers with incident cancer. *International Journal of Cancer*: 132, 155-161



"Snus use was not significantly associated with an increased risk of colorectal or anal cancer."

- Nordenvall C, Nilsson PJ, Ye W, Nyrén O (2011): Smoking, snus use and risk of right- and left-sided colon, rectal and anal cancer: a 37 year follow up study

## Snus and cancer

Several studies have been conducted on the link between snus and cancer. The results differ depending on which form of cancer was studied – but also depending on the choice of method.

Certain studies are marred by having been limited to a certain profession, without, as would have been preferable, taking into account underlying factors that may be specific to that group. Among other studies, we have previously referred to the example of a Swedish research team (Nordvall C, Nyrén O et al.) who studied male construction workers in two different studies over an extended period of time. One of these studies indicates a link between cancer-related mortality and both smoking and consuming snus, although it is significantly higher among the former group<sup>27</sup>.

The second of these studies concluded that smoking causes an increased risk of rectal cancer, but indicates that consuming snus does not significantly increase the risk of either rectal or colon cancer<sup>28</sup>. The same shortcomings in uncontrolled underlying factors were found in another study that indicated a link between consuming snus and gastroesophageal cancer<sup>29</sup> as well as in a study from 2007 that called attention to a link between snus and pancreatic cancer<sup>30</sup>. The latter study, whose research team included some of the same members, was also marred by the same shortcomings.

In a review conducted by Peter N. Lee of how the studies on the construction workers were used, he noted that these studies found links between snus and cancer that were never reported anywhere else from any other studies. This concerns e.g. oesophageal cancer and gastric cancer. Lee believes that there are methodology issues since the data collected in 1977 and earlier included a questionnaire that had been limited to snus in a questionable manner and that was dubiously coded regarding smokers. Several of these studies only used the older data and subsequently excluded results in which these methodology issues had been adjusted. Nor did any of these publications adjust the results for the type of profession<sup>31</sup>. He believes that the general behavioural patterns of the profession (such as e.g. alcohol consumption in a



“None of the publications adjusted for job type. One would imagine that for some jobs using snus is more convenient than is smoking, and associations may reflect the risk of the job rather than of snus use.”

- Lee, Peter N. (2010): Summary of the epidemiological evidence relating snus to health. *Regulatory Toxicology and Pharmacology* 59, 197-214

certain profession) may be an explanatory factor behind the health risk in each profession, rather than the use of snus<sup>32</sup>.

Another study – this one from 2004 – examined 10,136 Norwegian men who had been followed since 1966. The relative risk for users of snus compared with those who do not use tobacco was higher for pancreatic cancer than for oral cancer, oesophageal cancer or gastric cancer. The study concluded that snus entails a clear risk of pancreatic cancer, but does not entail any significant differences for oral cancer, for example<sup>33</sup>. However, in this context, we should remember that the study relates to another type of snus than Swedish snus. This was before Swedish snus had been introduced in the Norwegian market, which

<sup>28</sup> Nordenvall C, Nilsson PJ, Ye W, Nyrén O (2011): Smoking, snus use and risk of right- and left-sided colon, rectal and anal cancer: a 37 year follow up study. *International Journal of Cancer*. 2011 Jan 1;128(1):157-65

<sup>29</sup> Zendehelel K, Nyrén O, Luo J, Dickman PW, Boffetta P, Englund A, Ye W (2008): Risk of gastroesophageal cancer among smokers and users of Scandinavian moist snuff. *International Journal of Cancer*. 2008 Mar 1;122(5):1095-9.

<sup>30</sup> Luo J, Ye W, Zendehelel K, Adami J, Adami H-O, Boffetta O, Nyrén O (2007): Oral use of Swedish moist snuff (snus) and risk for cancer of the mouth, lung and pancreas in male construction workers: a retrospective cohort study. *Lancet*. 2007 Jun 16;369(9578):2015-20

<sup>31</sup> Lee, Peter N. (2010): Summary of the epidemiological evidence relating snus to health. *Regulatory Toxicology and Pharmacology* 59, 197-214

<sup>32</sup> Dito, s. 210

<sup>33</sup> Boffetta P, Aagnes B, Weiderpass E and Anderssen A (2004): Smokeless tobacco use and risk of cancer of the pancreas and other organs. *International Journal of Cancer*. 2005 May 10;114(6):992-5.

means that the results do not say anything about any link between Swedish snus and pancreatic cancer. Furthermore, this study also lacked background controls or adjustments for alcohol drinking habits among the participants. The link between pancreatic cancer and alcohol has been concluded in other studies and it is not unlikely to believe that users of snus may consume more alcohol than the population in general.

A major meta-analysis of pancreatic cancer and tobacco was recently conducted<sup>34</sup>. This study by an international research team dismisses any link whatsoever between pancreatic cancer and tobacco. The meta-analysis is mainly based on studies of other types of European and American smokeless tobacco than Swedish snus. However, if there is no link between cancer and these forms of smokeless tobacco, it is not likely that there would be a link when it comes to Swedish snus. The levels of potential carcinogens is and historically has been generally lower in Swedish snus than in, for example, American moist snuff.

The possible link between gastric cancer and the use of tobacco and alcohol has also been studied. In our review, we found a study from 1999 that focused on this. Of the three forms of gastric cancer, 90, 260 and 164 cases, respectively, were studied, which were compared with a control group of 1,164 individuals. All of the individuals were interviewed regarding their tobacco

and alcohol habits. Individuals who smoked were found to have a higher risks of all three types of gastric cancer. No link was observed for either former smokers, users of snus or individuals with a high alcohol intake<sup>35</sup>. Another study – this one from 1999 but published in 2000 – examined the link between snus, cigarettes and alcohol, and both gastric and oesophageal cancer. In terms of snus, no link could be concluded for any of the three types of gastric cancer or for oesophageal cancer<sup>36</sup>.

Yet another study examined the link between smoking tobacco, snus and alcohol, and squamous cell carcinoma in the otorhinolaryngological (ear, nose and throat) area. In this study, 605 cases were examined in two different geographical regions in Sweden, and a group of 756 individuals was selected as a control group. Smoking tobacco and drinking alcohol were concluded to have a strong effect on the risk of squamous cell carcinoma in the otorhinolaryngological area. However, there was no increased risk of this when consuming Swedish snus, according to the study<sup>37</sup>.

At the same time as these more specific studies point in opposite directions, there are research overviews related to the link between snus and cancer that completely question any link between the two<sup>38</sup>. In other words, there are isolated studies that indicate a link, but these either do not pertain to Swedish snus or they are marred

<sup>34</sup> Bertuccio P et.al. (2011): Cigar and pipe smoking, smokeless tobacco use and pancreatic cancer: an analysis from the International Pancreatic Cancer Case-Control Consortium, *Annals of Oncology*, Volume 22, Issue 6Pp. 1420-1426, 2011.

<sup>35</sup> Ye W, Ekström AM, Hansson LE, Bergström R och Nyrén O (1999): Tobacco, alcohol and the risk of gastric cancer by sub-site and histologic type. *International Journal of Cancer*. 1999 Oct 8;83(2):223-9.

<sup>36</sup> Lagergren J, Bergström R, Lindgren A, Nyrén O (1999/2000): The role of tobacco, snuff and alcohol use in the aetiology of cancer of the oesophagus and gastric cardia. *International Journal of Cancer*: 85, 340-346.

<sup>37</sup> Lewin F, Norell SE, Johansson H, Gustavsson P, Wennerberg J, Björklund A, Rutqvist LE (1998): Smoking tobacco, oral snuff, and alcohol in the Etiology of Squamous Cell Carcinoma of the Head and Neck. *Cancer*. 1998 Apr 1;82(7):1367-75.

<sup>38</sup> Lee PN, Hamling J. (2009): Systematic review of the relation between smokeless tobacco and cancer in Europe and North America. *BMC Medicine*20097:36



by methodology issues. Yet when assessing the overall scenario, there is no proven link between snus and cancer, as indicated by meta-analyses that have been conducted in recent years<sup>39,40,41</sup>.

Alleged links between using snus and oral and oesophageal cancer are also unsubstantiated by the meta-analyses. Any link between using snus and lung cancer has also been dismissed. And hypotheses about a link between using snus and gastric cancer have also been dismissed. The studies that pointed to a link between snus and pancreatic cancer were not substantiated by the meta-analyses. On the contrary, they indicate the absence of a link between this form of cancer and various forms of smokeless tobacco.

Finally, we want to add one aspect. When discussing a potential link between cancer and snus in particular, product development ought to be taken into account. Comparisons over time indicate that the presence of nitrosamines declined significantly in snus in the years between the 1980s and 2001/2002 alone<sup>42</sup>. The more refined the product becomes, the lower the levels of hazardous elements. This ought to be taken into account in the discussion henceforth – instead of making it harder for consumers of snus and for the consumption of snus, consideration must be given to the fact that the product as such continues to improve from a

health perspective over time. This appears to particularly apply to any potential link between snus and cancer.

## Snus, MS, Parkinson's and Alzheimer's

The state of research on snus and MS has changed over time. A Swedish research team first released a report that focused on tobacco in general, but that concluded that smoking led to an increased risk of multiple sclerosis (MS), while Swedish snus did not lead to any increased risk of MS<sup>43</sup>. A year or so later, the same research team conducted an in-depth study on the effects of snus itself on the risk of MS



“Snuff-takers have a decreased risk of developing MS compared with those who have never used moist snuff [...], and we found clear evidence of an inverse dose-response correlation between cumulative dose of snuff use and the risk of developing the disease.”

- Hedström A, Hillert J, Olsson T, Alfredsson L. (2013): Nicotine might have a protective effect in the etiology of multiple sclerosis.

<sup>39</sup>Bertuccio P et.al. (2011): Cigar and pipe smoking, smokeless tobacco use and pancreatic cancer: an analysis from the International Pancreatic Cancer Case-Control Consortium, *Annals of Oncology*, Volume 22, Issue 6Pp. 1420-1426, 2011.

<sup>40</sup> Lee, Peter N, Summary of the epidemiological evidence relating snus to health, *Regul. Toxicol. Pharmacol.*, 59(2), 197-214, 2011.

<sup>41</sup> Lee, Peter N. (2013): Epidemiological evidence relating snus to health – an updated review based on recent publications. *Harm Reduct J.* 2013; 10: 36.

<sup>42</sup> Österdahl BG, Jansson C, Paccou A (2004): Decreased Levels of Tobacco-Specific N-Nitrosamines in Moist Snuff on the Swedish Market. *Journal of Agricultural and Food Chemistry*

<sup>43</sup> Hedström AK, Bäärnhielm M, Olsson T, Alfredsson L (2009): Tobacco Smoking, but not Swedish Snuff Usage, Increases the Risk of Multiple Sclerosis. *Neurology.* 2009 Sep 1;73(9):696-701

and found an inverse link – users of snus had less risk of developing MS than those who had never used snus. The researchers deemed these findings to be “clear evidence” of a link between snus consumption and a reduced risk of MS. The research report even indicated that the greater the consumption of snus, the lower the risk of developing MS<sup>44</sup>. The study was conducted as two cohort population studies in Sweden, which collectively made the study based on 7,833 snus users and a control group of 9,437 non-snus users.

No studies on Parkinson’s and smokeless tobacco have been conducted on Swedish snus, but a study on any potential link between snus and Parkinson’s indicates a very strong protective effect. In other words, that snus mitigates the risk of developing Parkinson’s. Some 95,981 men were included in the analysis, which was conducted by an American research team<sup>45</sup>. The protective effect is linked to the nicotine, which makes it probable that Swedish snus would have a similar effect.

Regarding the link between snus and Alzheimer’s and dementia, there largely seems to be a lack of studies. However, there are studies on the link between Alzheimer’s and nicotine, with some pointing in the direction that nicotine inhibits Alzheimer’s, including an article in the

publication *Läkemedelsvärlden* (a journal on pharmaceuticals) which refers to a US study<sup>46</sup>, though this has been disputed and claims to the contrary have been made.

## The consumption of snus during pregnancy

We have shown that many common claims about the potential health effects of using snus are inaccurate and unsubstantiated by research. However, we still want to advise pregnant women against using snus. About one percent of all pregnant women use snus on a regular basis in the early phase of pregnancy. Nicotine affects the brain’s development in the foetus during pregnancy<sup>47</sup>. The fact that the foetus is exposed to nicotine during pregnancy may also increase the risk of a lower weight at birth and premature birth<sup>48</sup>. Certain studies also indicate an increased risk of a cleft palate<sup>49</sup>. However, these foetal risks were not found in studies examining the effect of quitting smoking immediately prior to or at a very early stage of pregnancy. Another risk that has been called attention to is that the foetus of mothers who use snus may develop a positive association with nicotine that may affect its risk of developing a nicotine dependency at a young age.

<sup>44</sup> Hedström AK, Hillert J, Olsson T, Alfredsson L. (2013): Nicotine might have a protective effect in the etiology of multiple sclerosis. *Multiple Sclerosis*. 2013 Jul;19(8):1009-13.

<sup>45</sup> Eilis J, O’Reilly, Marji L, McCullough, Ann Chao, S. Jane Henley, Eugenia E. Calle, Michael J. Thun, A. Ascherio (2005): Smokeless tobacco use and the risk of Parkinson’s disease mortality.

<sup>46</sup> Article in the journal *Läkemedelsvärlden* (18 June 2003) <http://www.lakemedelsvarlden.se/nyheter/biprodukt-till-nikotin-hejdar-alzheimers-sjukdom-2863>

<sup>47</sup> Pauly, J. R., & Slotkin, T. A. (2008):. Maternal tobacco smoking, nicotine replacement and neurobehavioural development. *Acta Paediatrica*, 97(10), 1331–1337. doi: 10.1111/j.1651-2227.2008.00852.x. Epub 2008 Jun 12.

<sup>48</sup> Baba S, Wikström A-K, Stephansson O och Cnattingius S (2012): Changes in snuff and smoking habits in Swedish pregnant women and risk for small for gestational age births. *An International Journal of Obstetrics and Gynaecology*

<sup>49</sup> Gunnerbeck A, Edstedt Bonamy AK, Wikström AK, Granath F, Wickström R, Cnattingius S. (2014): Maternal snuff use and smoking and the risk of oral cleft malformations—a population-based cohort study. *PLoS One*. 2014 Jan 15;9(1):e84715. doi: 10.1371/journal.pone.0084715. eCollection 2014.

# Snus as a minimiser of harm

## Background

Kjell Asplund, whose later positions included being Director-General of the National Board of Health and Welfare, stated in the medical journal *Läkartidningen* in 2003 that snus was a suitable substitute for smoking<sup>50</sup>. In the Swedish political debate, this marked one of many statements in a contaminated discussion on the potential role of snus as in harm reduction. The idea is that snus is so much less hazardous than cigarettes that many lives would be saved if more smokers switched to snus instead. It may also be the case that snus becomes an alternative to other types of tobacco for young people, meaning that they never transition into using other forms of tobacco than snus. Organisations like Tobaksfakta object to this line of reasoning. They claim that, if anything, the harm reduction argument contributes to increased tobacco consumption since certain consumers otherwise would have quit completely. They also believe that snus contributes to a greater number of tobacco users through the very existence of snus itself – if snus had not existed, many people would not have consumed tobacco. All current tobacco consumers would hardly have become smokers<sup>51</sup>. However, we object to this – even if the existence of snus were to cause more people to consume tobacco overall, this must be seen in proportion to the decrease in ill

health that comes from more people consuming snus as opposed to some other form of tobacco. Also, both of these claims from Tobaksfakta were made without referencing any studies. Let us instead take a closer look at the evidence that is actually available!

Two Australian researchers have provided an explanation as to why harm reduction/harm minimisation<sup>52</sup> is controversial. They believe that this is caused by the experiences of misguided attempts during the 1950s with the concepts of “safe” cigarettes with filters, and “light” cigarettes, as well as concerns that the tobacco industry uses harm-reduction products to undermine strategies aimed at controlling tobacco and taking preventative measures. They conclude that the most promising harm reduction products are drugs – meaning pharmaceutical nicotine products – and smokeless tobacco that contains low doses of nitrosamines, like Swedish snus. Accordingly, they advocate taking measures to research the advantages of encouraging smokers to switch to less harmful nicotine agents<sup>53</sup>.

## The health effects of using snus as a harm reduction tool

It is highly probable that there is a link between the number of smokers and the number of people who use snus in a country – Sweden has the highest percentage of snus users in Europe, while also having the lowest percentage of smokers. In Sweden, one form of tobacco has been replaced by another, more harmless version. This link must be deemed substantiated<sup>54</sup>. The percentage of people who use both snus and cigarettes on a daily basis is very

<sup>50</sup> Asplund K (2003): Snusning innebär mindre risk för kardiovaskulär sjukdom. *Läkartidningen* nr 25 2003. Volym 100.

<sup>51</sup> Tobaksfakta's Fact sheet on snus, January 2014 [http://tobaksfakta.se/wp-content/uploads/2014/01/Om-snusset\\_jan20141.pdf](http://tobaksfakta.se/wp-content/uploads/2014/01/Om-snusset_jan20141.pdf)

<sup>52</sup> The use of the terms harm minimization or harm reduction in this text are based on their use in the source text. In this case, the researchers are specifically discussing harm reduction.

<sup>53</sup> Gartner C, Hall W (2009): Harm reduction policies for tobacco users. *Int J Drug Policy*. 2010 Mar;21(2):129-30

<sup>54</sup> Royal College of Physicians (2016): Nicotine without smoke: Tobacco harm reduction

low – only about 1 per cent of Sweden’s population uses both<sup>55</sup>. A researcher at the FDA’s Center for Tobacco Products also concluded that in “Sweden, where the use of snus is more common, the percentage of smokers among men and the percentage of tobacco-related ill health and death is lower than in other developed nations”<sup>56</sup>. When examining the example of Swedish snus, Australian researchers have also concluded that there is a correlation between the increased use of snus and the decreased use of cigarettes – and thus a reduction in mortality caused by tobacco-related ill health<sup>57</sup>. The same researchers also concluded that the health benefits when cigarette smokers switch to smokeless tobacco with a low level of nitrosamines (like Swedish snus) are almost as great as when these smokers completely abstain from tobacco consumption.

The US FDA has concluded that Swedish snus, when used exclusively instead of cigarettes, entails a lower risk of developing COPD, emphysema and chronic bronchitis (an inflammation of the bronchi in the lungs), as well as certain types of cancer, including lung cancer<sup>58</sup>.

Smoking cessation requires the product to actually work, and that the smoker does not quickly return to smoking cigarettes. One study shows that snus is more successful as a means for smoking cessation than other researched methods, and that there are statistically significant differences



“Increased snus use was associated with decreased cigarette smoking and mortality from tobacco-related disease [...] Epidemiological modelling suggests that the health gains from switching to low nitrosamine smokeless tobacco (LNSLT) are nearly as large as those from quitting all tobacco use.”

- Gartner C, Hall W (2009): Harm reduction policies for tobacco users

among men in particular<sup>59</sup>. Another study held a similar position and identified two groups of smoking men who wanted to stop smoking. One group was given snus as a replacement, but not the other group. The group that used snus was significantly more inclined to succeed in completely ending their use of cigarettes. The study using Swedish snus was conducted in Serbia. The study reached the conclusion that Swedish snus should be used as a method for smoking cessation in Serbia<sup>60</sup>. Another study that supports these conclusions was conducted on 6,752 Swedish adults by Lars Ramström and J Foulds in 2006. They concluded that for both men and women, it was significantly more probable that they would completely quit smoking if they

<sup>55</sup> Tobaksvanor 2015 – regionala resultat. Folkhälsomyndigheten januari 2016.

<sup>56</sup> Presentation by Conrad J. Choiniere, PhD at the Office of Science, Center for Tobacco Products at FDA (US Food and Drug Administration), march 2, 2016, Chicago, ILL. Society for research on nicotine and tobacco.

<sup>57</sup> Gartner C, Hall W (2009): Harm reduction policies for tobacco users. *Int J Drug Policy*. 2010 Mar;21(2):129-30

<sup>58</sup> Presentation by Li-Lun Chen, M.D. Director of Individual Health Science at FDA (US Food and Drug Administration), march 2, 2016

<sup>59</sup> Rutqvist LE (2012): Population-based survey of cessation aids used by Swedish smokers. *Harm Reduction Journal*. 2012 Dec 4;9:38

<sup>60</sup> Joksic G, Spasojevic-Tisma V, Antic R, Nilsson R, Rutqvist LE (2011): Randomized, placebo-controlled, double-blind trial of Swedish snus for smoking reduction and cessation. *Harm Reduct J*. 2011 Sep 13

switched to using snus instead<sup>61</sup>.

A number of researchers made estimates concerning how many lives would be saved if more people switched from cigarettes to snus. If the entire EU were to have the same levels in terms of the number of smokers as Sweden does – where the population instead uses snus – then 200,000 fewer men and 1,100 fewer women would die of tobacco-related diseases every year<sup>62</sup>. The substantially lower figure for women is due to the fact that it is common for men to switch from cigarettes to snus in Sweden. This happens to a significantly lower extent when it comes to women. Similar estimates regarding how many lives would be saved if more people switched from cigarettes to snus have been made by US researchers<sup>63</sup>.

Modelling conducted by several US and Canadian researchers showed how much smoking could be estimated to be reduced in the US if smokeless tobacco with a low level of nitrosamines – like Swedish snus – was introduced in the US market. They believe that a new policy under which smokeless tobacco with a low level of nitrosamines were permitted would result in an accelerating trend toward ever fewer smokers in the US. The current decline in the number of smokers, 1.3 per cent over a five-year period, would then instead be 3.1

per cent over a five-year period<sup>64</sup>.

Swedish snus can also be compared with other forms of smokeless tobacco from a harm reduction perspective. According to a study conducted by the US FDA (food and drug administration), Swedish snus has a significantly lower level of the two nitrosamines, NNN<sup>65</sup> and NNK<sup>66</sup>, than the smokeless tobacco products that are currently available in the US market<sup>67</sup>.

The effects of using Swedish snus as a smoking cessation method for consumers in Australia was estimated using risk modelling. The life span of former smokers who had completely stopped using tobacco was compared with former smokers who had switched to snus. No significant difference in life spans was measured between these two groups. The study concluded that current smokers who switch to snus instead of continuing to smoke may experience substantial health improvements. Accordingly, they also believe that removing Australia's current restrictions on the sale of snus would probably be beneficial for public health<sup>68</sup>.

We must also ask ourselves what is most important: the lowest possible use of tobacco, or the least amount of harm. If, for example, the use of snus has 5 per cent

<sup>61</sup> Ramström LM, J Foulds (2006): Role of snus in initiation and cessation of tobacco smoking in Sweden. *Tobacco Control* 2006;15:210-214

<sup>62</sup> Rodu B., Cole P. (2004): The burden of mortality from smoking: comparing Sweden with other countries in the European Union. *Eur J Epidemiol.* 2004;19(2):129-31.

<sup>63</sup> Vigneswaran N, Tilashalski K, Rodu B, Cole P (1995): Tobacco use and cancer. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.*

<sup>64</sup> Levy D, Mumford E, Cummings KM, Gilpin EA, Giovino GA, Hyland A, Sweaner D, Warner KE, Compton C (2005): The potential impact of a low-nitrosamine smokeless tobacco product on cigarette smoking in the United States: Estimates of a panel of experts. *Addict Behav.* 2006 Jul;31(7):1190-200. Epub 2005 Oct 26.

<sup>65</sup> The tobacco-specific nitrosamine N-Nitrosornicotine (NNN)

<sup>66</sup> The tobacco-specific nitrosamine Nicotine-derived nitrosamine ketone (NNK)

<sup>67</sup> Presentation by Li-Lun Chen, M.D. Director of Individual Health Science at FDA (US Food and Drug Administration), march 2, 2016, Chicago, ILL. Society for research on nicotine and tobacco.

<sup>68</sup> Gartner CE, Hall WD, Vos T, Bertram MY, Wallace AL, Lim SS (2007): Assessment of Swedish snus for tobacco harm reduction: an epidemiological modelling study. *PLoS Medicine*, July 2007, Volume 4, Issue 7

of the harmful effects of smoking, then the state of health would improve if the entire population used snus and no one smoked, compared with a scenario in which 10 per cent of the population smoked.

Finally, we can note that Li-Lun Chen, Director at the Center for Tobacco Products at the US FDA, recommends that Swedish snus should be introduced in the US. This recommendation is based on the fact that Swedish snus has the potential to reduce the negative health effects of other types of tobacco use<sup>69</sup>.

It is our overall assessment that there are good reasons to use snus for smoking cessation purposes, since snus has an evident harm reducing effect.

### **Consumer perspective on smoking cessation and harm reduction**

An argument that has been used from both a political perspective and by Tobaksfakta against regarding snus as a smoking cessation product or harm reducer, is that doing so would prevent consumers from learning about any potentially negative health effects of snus. However, this claim has been tested by two researchers. In 2010, a survey was conducted among smokers regarding what health risks they see with both snus and other nicotine products for smoking cessation. The study indicated that there were misconceptions regarding snus and other nicotine products that discouraged smokers from beginning to use these with the aim of smoking cessation. Accordingly, the study proposed public and objective information featuring comparisons between the health impact of smoking and other nicotine products, including snus<sup>70</sup>.



“Public information about smoking and health should be expanded to include objective and unambiguous information regarding nicotine’s part in the harmfulness of smoking and the harmfulness of different nicotine-containing products compared to smoking. This is essential in order to preclude that misperceptions regarding these matters could discourage smokers from adopting effective cessation practices with use of nicotine-containing aids.”

- Wikmans T, Ramström L (2010): Harm perception among Swedish daily smokers regarding nicotine, NRT-products and Swedish Snus

In order for consumers to be able to make well-informed choices, both knowledge and information are required. The exact same logic applies whether you are buying pasta or purchasing nicotine products. Yet instead of providing more information on the contents of the products, legislation is proceeding in the opposite direction – it is proposed that the packages be neutral, and that information on flavours and nicotine content be banned. All of this in order to not risk luring more people to use tobacco. This contradicts the study from 2010 – when consumers have vague or inaccurate perceptions regarding the effects of smoking cessation products, then it is reasonable to assert that more information is needed, not less.

<sup>69</sup> Presentation by Li-Lun Chen, M.D. Director of Individual Health Science at FDA (US Food and Drug Administration), march 2, 2016, Chicago, ILL. Society for research on nicotine and tobacco.

<sup>70</sup> Wikmans T, Ramström L (2010): Harm perception among Swedish daily smokers regarding nicotine, NRT-products and Swedish Snus. Tobacco Induced Diseases 2010. 8:9

# The Snus Commission's conclusions and recommendations

Based on the research that has been compiled regarding the health effects of snus, the Snus Commission has agreed on a number of conclusions and recommendations.



## Do not classify Swedish snus in the same category as cigarettes

We do not believe that it is credible to refer to snus and cigarettes in general terms using the same description of the problem. These are two products with very different health effects and that are used in different ways. As we have been able to demonstrate in this report, Swedish snus, unlike several other types of tobacco, has a very limited negative health impact. Accordingly, legislation should not then categorise snus

as the same type of product as cigarettes and other types of tobacco either, which is what is now being done in the legislative proposals that have been presented by the government's investigator. If one wants to categorise snus along with other products, then we believe it is more reasonable for it to belong to the same category as e-cigarettes, nicotine gum, nicotine patches and similar nicotine products that have relatively limited demonstrable adverse health effects. After all, it is not the nicotine per se that poses a health hazard, but smoking tobacco with all of the hazardous compounds that are created in the cigarette's burning process<sup>71</sup>.

<sup>71</sup> Chief Physician Stefan Willers in Dagens Medicin, published 24 March 2016: <http://www.dagensmedicin.se/artiklar/2016/03/24/nikotin-i-sig-sjalv-utgor-ingen-storre-halsofara/>

## Its potential as a smoking cessation tool has not been fully harnessed

As we reported in the chapter on snus as a harm reduction tool, research indicates certain misunderstandings among consumers regarding the effects of snus. Comprehensive information on the limited health effects – instead of plain packs and visual display bans – could result in more people switching from cigarettes to snus. Consequently, the current political course will result in negative health effects since more people would probably have switched from cigarettes to snus if they had understood how substantial the health benefits are that this entails.

Those who equate snus with smoking tobacco bear a significant responsibility for health developments in Sweden, since they are not acknowledging the major differences in health effects that we have summarised in this report. In this respect, the government's investigator, Göran Lundahl, is among those worthy of blame. He recently introduced a spate of proposals calling for a very strict regulation of snus: A ban on listing scents and flavours on the packaging, a visual display ban and detailed regulations governing the number of portion pouches in each can of snus. All of these actions claim to be for public health reasons, despite a lack of any established health arguments.

The investigator has even expressly stated that

the actual facts of the matter are uninteresting: “Regardless of the relationship between the assessments of snus as a smoking cessation tool or of snus’s lower level of hazard compared with cigarettes, we have concluded that as the basis for our tobacco policy, no distinction shall be made between different types of tobacco. This has also served as the basis for our considerations and proposals”<sup>72</sup>. Meanwhile, different types of tobacco products are being distinguished in other ways. The fact is that the nicotine in nicotine patches or nicotine gum, for example, also comes from the tobacco plant.

Instead of basing this legislation on research and science, snus is being categorised along with other forms of tobacco and being very strictly regulated – regardless of the consequences.

## The politicians are not applying the same logic for snus as for other products

As we have demonstrated in this report, snus has not been proven to be harmful, although it is an addictive product that pregnant women should avoid in consideration of the foetus. Many common claims about the links between snus and ill-health have not been proven in study after study. Over-regulating a product that has long been available in the Swedish market due to alleged health risks that have not been proven is an unreasonable approach.

<sup>72</sup> Government investigation SOU 2016:14, “A review of the Tobacco Act – new steps toward decreased tobacco use”, p. 123



## More information beneficial

In conclusion, we would like to point out that all research in this field is welcome. In this report, we have compiled and commented on research regarding snus and its health effects. Certain types of health effects have been heavily researched, while other health effects have only been the subject of isolated studies.

In other words, continued research in the area should be considered. The most important aspect here is to put all of the cards on the table – all of the facts must be presented.

It is also important to consider the existing research in the proper manner. If the political objectives run contrary to the existing research results, this should be noted. Particularly when such a course may entail a health hazard for segments of the population.



## What does the research say about the link between snus and...

MS	Link: Reduced risk of MS when consuming Swedish snus	Probably less risk of developing MS for individuals who use snus.
Stroke	No link	Snus has no effect on the risk of stroke.
Cardiac capacity	No link	Cardiac capacity remains unchanged when consuming snus.
Atrial fibrillation	No link	Snus has no material effect on the risk of atrial fibrillation.
Caries	No link	Snus has no effect on the risk of caries.
Periodontitis	No link	Snus has no effect on the risk of periodontitis.
Arteriosclerosis	No link	Snus has no effect on the risk of arteriosclerosis.
Myocardial infarction	No link with risk of being afflicted.	No link between the risk of having a myocardial infarction and the consumption of snus, although the effect may be worse for snus users.
Lung cancer	No link	Snus has no effect on the risk of lung cancer.
Skin cancer	No link/more research needed	No link between Swedish snus and squamous cell carcinoma (a form of skin cancer).

Heart failure	Unclear/more research needed	There may be some link; more research needed.
Metabolic syndrome	Unclear/more research needed	There may be some link, though more research is needed.
Diabetes	Unclear/more research needed	No link has been substantiated between the consumption of snus and the risk of diabetes during the normal consumption of snus, though it cannot be precluded either.
Gastric cancer	No link/more research needed	Swedish snus does not have any effect on the risk of gastric cancer, though more research may be needed.
Oral and oesophageal cancer	No link/more research needed	The meta-analyses that have been conducted indicate that there is no link. More research needed.
Pancreatic cancer	No link/more research needed	The research that is available and that indicates a potential link was conducted without controlling for other underlying factors or on products other than Swedish snus. The meta-analysis that were recently conducted concluded the absence of a link between tobacco and pancreatic cancer.
Alzheimer's	Unclear/reduced risk	Some research suggests that the risk of Alzheimer's decreases when consuming nicotine. No specific research on the health effects of Swedish snus on Alzheimer's have been identified. A new research project in the area has been initiated.
Pregnancy	Certain risks, including premature birth	Nicotine affects the brain's development in the foetus. There is also some risk of premature birth and of cleft palate.

# **SNUS** **KOMMISSIONEN**

The Snus Commission's first report, May 2016  
Read more on [snuskommissionen.se](http://snuskommissionen.se)

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