

# Snus, svart eller vitt?

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# Jag använder:

1. Ingen nikotinprodukt
2. Nikotinersättningsmedel
3. Vitt nikotinsnus
4. Brunt tobakssnus
5. Cigaretter



# Nicotiana Tabacum



# Nikotin engagerar!

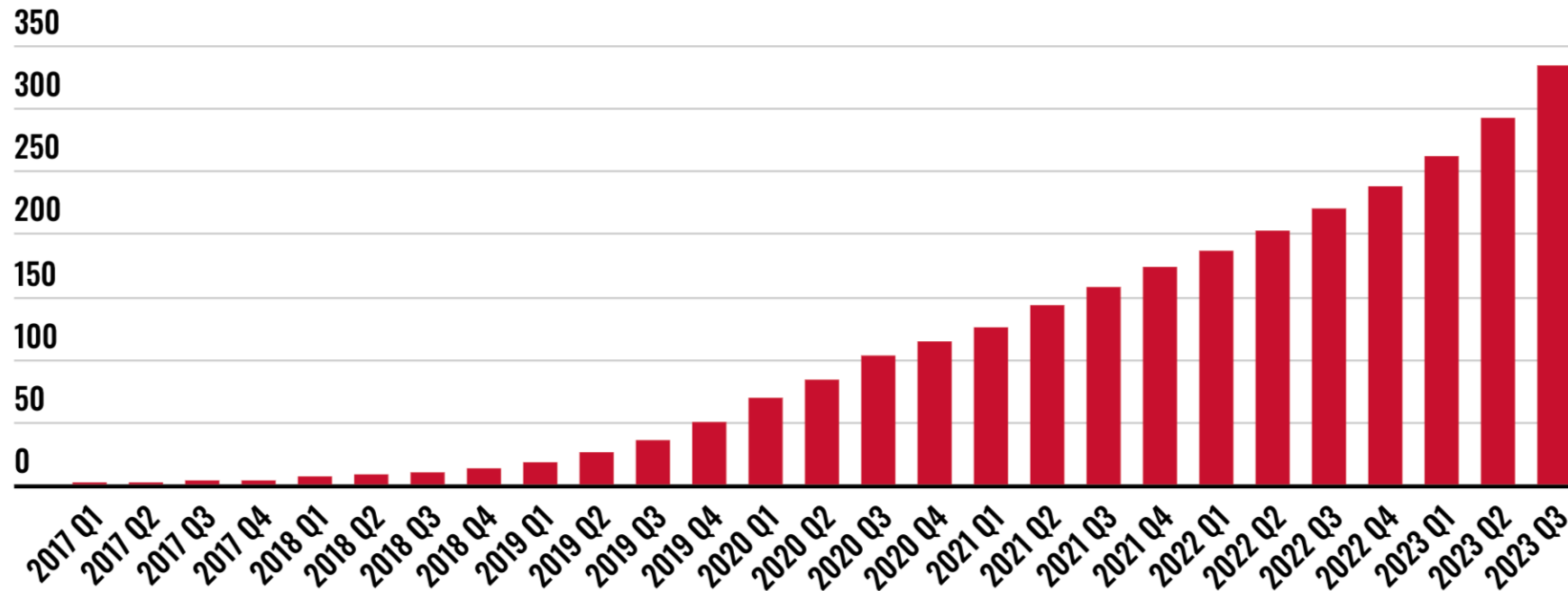
“I don't believe that nicotine or our products are addictive.”



# Nikotinsnus växer i USA

## ZYN-försäljningen i USA har exploderat

Miljoner dosor, på rullande tolv månader



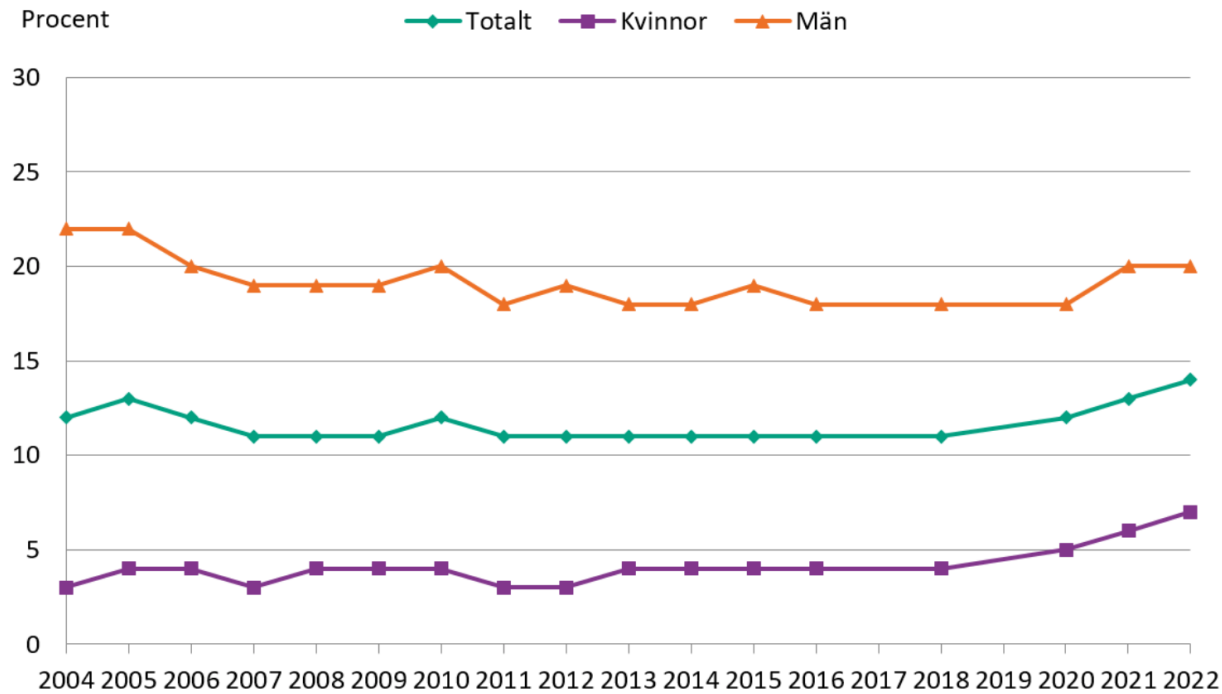
Källa: Philip Morris rapport för Q3 2023.



# Snus – daglig användning



Figur 5. Andel (procent) personer i åldern 16-84 år som uppgav daglig användning av snus under perioden 2004-2022, uppdelat på kön.

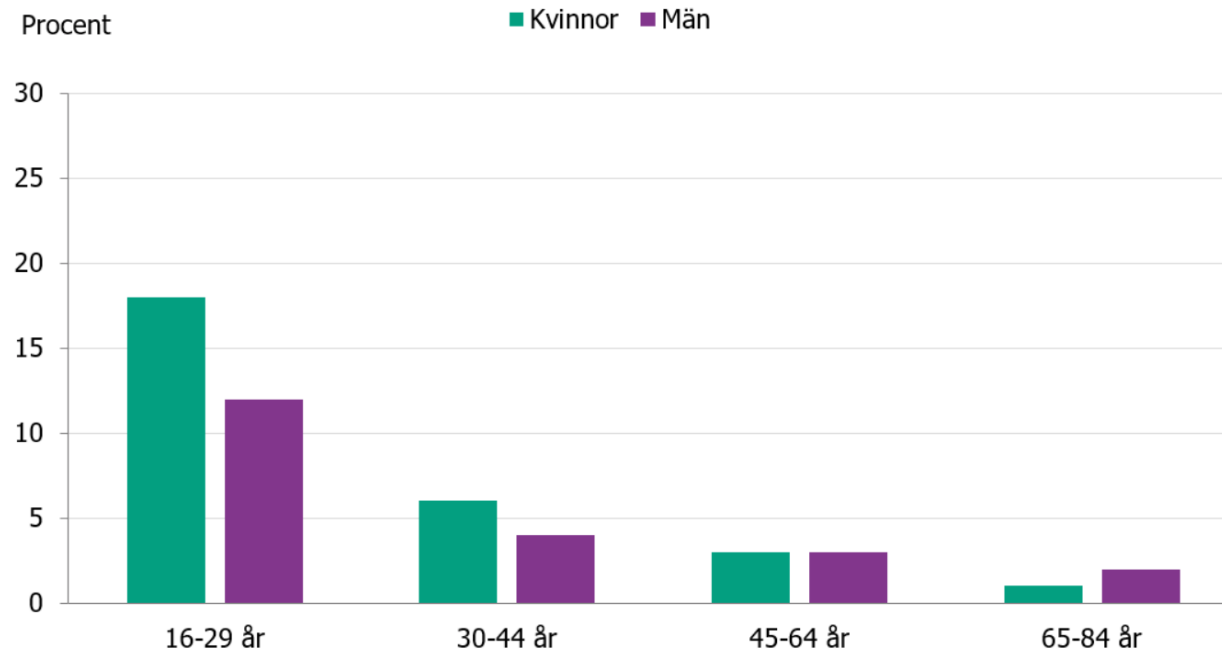


Källa: Nationella folkhälsoenkäten Hälsa på lika villkor, Folkhälsomyndigheten.

# Nikotinsnus vanligast hos unga kvinnor



**Figur 7. Andel (procent) personer i åldern 16-84 år som uppgav användning av nikotinsnus dagligen eller ibland, uppdelat på ålder och kön.**

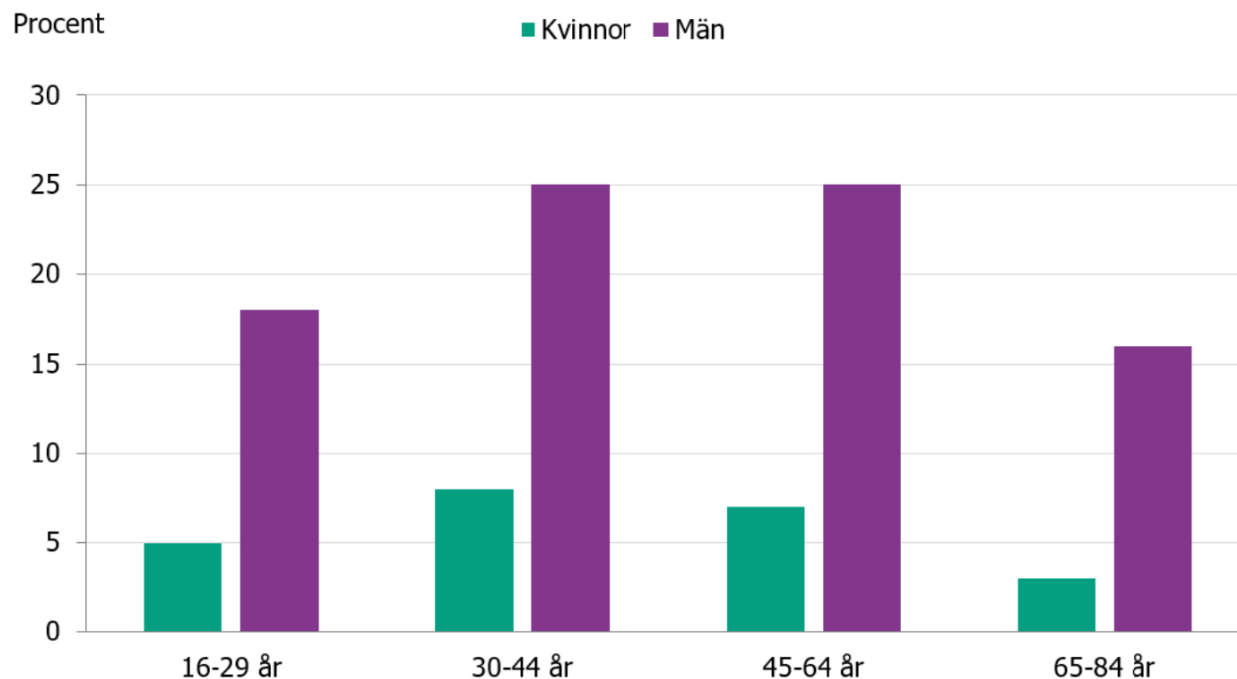


Källa: Nationella folkhälsoenkäten Hälsa på lika villkor, Folkhälsomyndigheten.

# Tobakssnus vanligast hos medelålders män



**Figur 8. Andel (procent) personer i åldern 16-84 år som uppgav användning av tobakssnus dagligen eller ibland, uppdelat på ålder och kön.**



Källa: Nationella folkhälsoenkäten Hälsa på lika villkor, Folkhälsomyndigheten.



# Innehåll varierar

- Vikt per portion
- Nikotinhalt
- pH-värde
- Tungmetaller
- Nitrosaminer
- Smaktillsatser
- Söttningsmedel
- Fyllnadsmedel osv.
















# Innehåll varierar



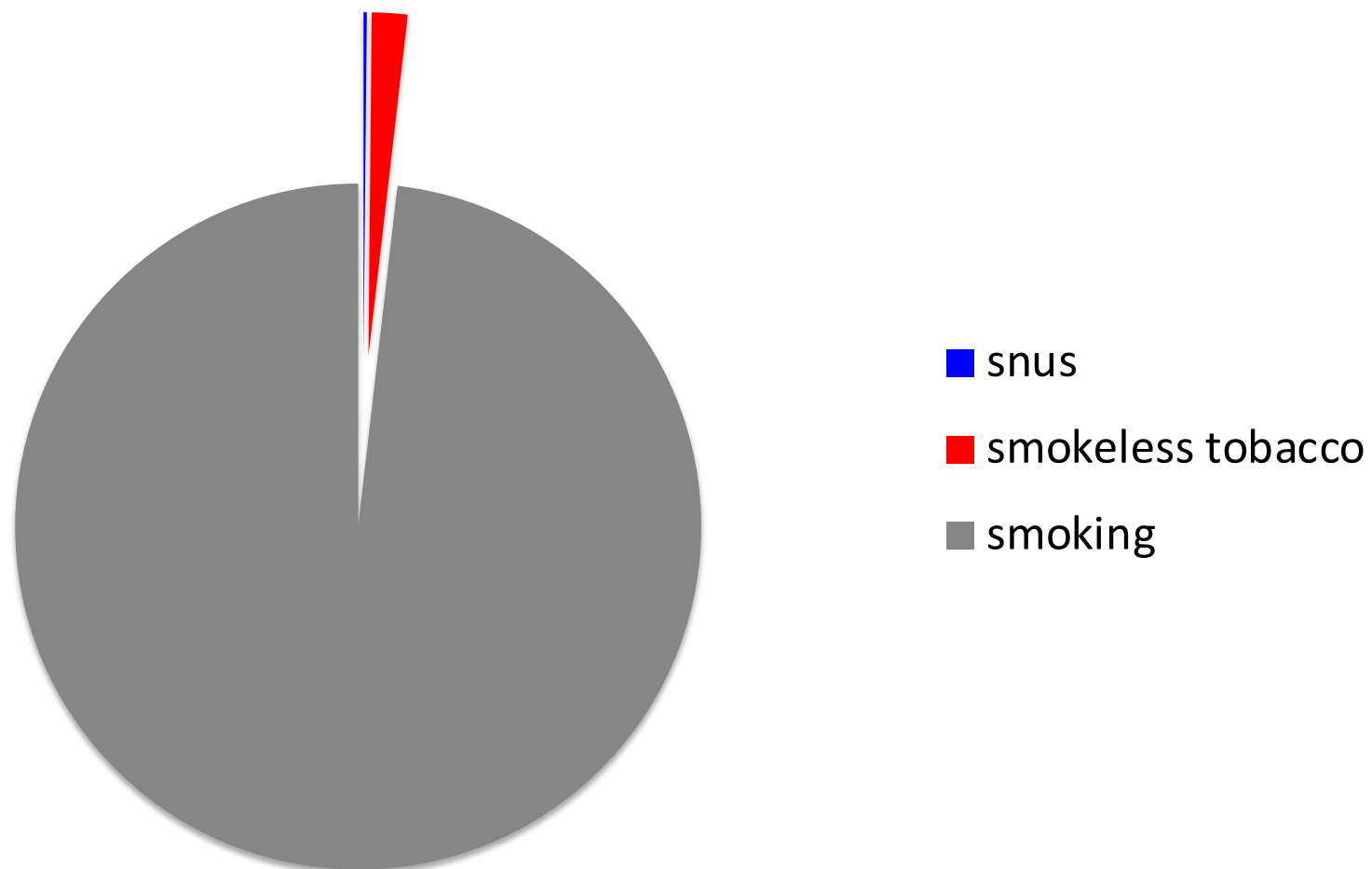
## OBEROENDE LABORORIETEST

### Tobaksfritt snus

														REFERENS
	Helwit Violet	Velo Royal Tea	Zyn Violet Licorice	Après Ice Tea Peach	Zyn Cool Mint Dry	Velo Spicy Pineapple	ZONE Berry Fresh	Gritt Frost Bite	Volt Deep Freeze	Lundgrens Rimfrost	VELO Max Freeze	Skruf Super White Fresh Mint	General Original portion	
Angiven styrka	●●○○	●●○○	●●○○	●●●●	●●●●●	●●●●○	●●●●○	●●●●●	●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	
Tillverkare	helwit.se	bat.com	swedishmatch.se	byapres.com	swedishmatch.se	bat.com	skruf.se	ministryofsus.com	swedishmatch.se	bat.com	bat.com	skruf.se	swedishmatch.se	
Vikt per portion (g)	0,4	0,7	0,8	0,7	0,6	0,7	0,6	0,6	0,8	1,0	0,7	0,9	1,0	
Nikotinhalt (mg/portion)	2,3	5,2	6,9	9,0	9,3	10,3	10,9	11,7	13,5	14,2	16,4	19,9	8,0	
PH-värde	9,2	8,9	8,3	8,4	8,3	9,0	8,7	9,5	8,7	8,6	8,5	8,5	8,8	
Vattenhalt (g/100g)	11,7	44,5	38,2	32,6	2,7	41,6	33,0	33,8	33,5	49,0	48,4	39,4	48,2	
Nitrosaminer (NNK & NNN) (µg/g)	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	0,48	
Arsenik (mg/kg)	< 0,05	< 0,05	< 0,05	< 0,050	< 0,05	< 0,05	< 0,05	< 0,05	< 0,05	< 0,05	< 0,05	< 0,05	0,05	
Bly (mg/kg)	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	< 0,02	0,02	0,045	0,04	< 0,02	< 0,02	0,04	0,12	
Kadmium (mg/kg)	< 0,01	< 0,01	< 0,01	< 0,010	< 0,01	< 0,01	< 0,02	< 0,01	< 0,01	< 0,01	< 0,01	< 0,01	0,24	
Krom (mg/kg)	0,17	< 0,05	0,09	0,11	< 0,05	< 0,05	0,10	0,52	0,07	< 0,05	0,10	0,22	0,40	
Nickel (mg/kg)	0,10	< 0,05	< 0,05	0,11	< 0,05	< 0,05	0,07	0,22	0,06	< 0,05	0,06	0,10	0,65	
Kommentar	Låg nikotinhalt men mycket högt pH-värde ger snabb nikotineffekt.	Lägre nikotinhalt men högt pH-värde ger starkare nikotineffekt.	Något lägre nikotinhalt och lägre pH-värde ger svagare nikotineffekt.	Nikotinhalt i nivå med vanligt snus men lägre pH-värde ger svagare nikotineffekt.	Nikotinhalt i nivå med vanligt snus. Lägre pH-värde och mycket låg vattenhalt ger svagare nikotineffekt.	Relativt hög nikotinhalt och högt pH-värde ger stark nikotineffekt.	Relativt hög nikotinhalt och förhöjt pH-värde ger stark nikotineffekt.	Hög nikotinhalt och mycket högt pH-värde ger väldigt stark nikotineffekt.	Hög nikotinhalt och förhöjt pH-värde ger stark nikotineffekt.	Hög nikotinhalt och förhöjt pH-värde ger stark nikotineffekt.	Mer än dubbelt så mycket nikotin som i tobakssnus och förhöjt pH-värde ger väldigt stark nikotineffekt.	Nära tre gånger så mycket nikotin som i tobakssnus och förhöjt pH-värde ger väldigt stark nikotineffekt.	Högre nivåer av tungmetaller och nitrosaminer jämfört med de tobaksfria snusen.	

# Tobaksvetenskap

Antal vetenskapliga artiklar vid PUBMED-sökning



Vad säger guidelines?



EUROPEAN  
SOCIETY OF  
CARDIOLOGY



## Policy suggestions for population-based approaches to smoking and other tobacco use – Settings (2)

Recommendations	Class	Level
<b>Community setting</b>		
It is recommended that health personnel, caregivers, and school personnel set an example by not smoking or using tobacco products at work.	I	A
It is recommended to advise parents to be tobacco-free when children are present.	I	A
It is recommended to advise pregnant women to be tobacco-free during pregnancy.	I	A
It is recommended to advise parents to never smoke in cars and private homes.	I	A
Residence-specific restrictions on smoking should be considered.	IIa	B

Vad ska man tro?

**SvD** Swedish Daily News

Ansedd medicintidskrift  
uppmanar alla rökare att

**BÖRJA  
SNUSA**

Studie: Mycket mindre  
risk drabbas av cancer

**IDAG Därför kan inte  
tonåringar planera**

© 2007 SvD

**DN.** Dagens Nyheter

Och de nominerade är..  
Läs om kandidaterna till Guldrakon 

**"SNUSARE  
FÅR OFTARE  
CANCER"**

Ny svensk studie pekar på fördubblad risk

**Miss inte krysset och snusaren**

# Snus och mortalitet

Byhamre et al. *International Journal of Epidemiology*, 2020, Vol. 49, No. 6

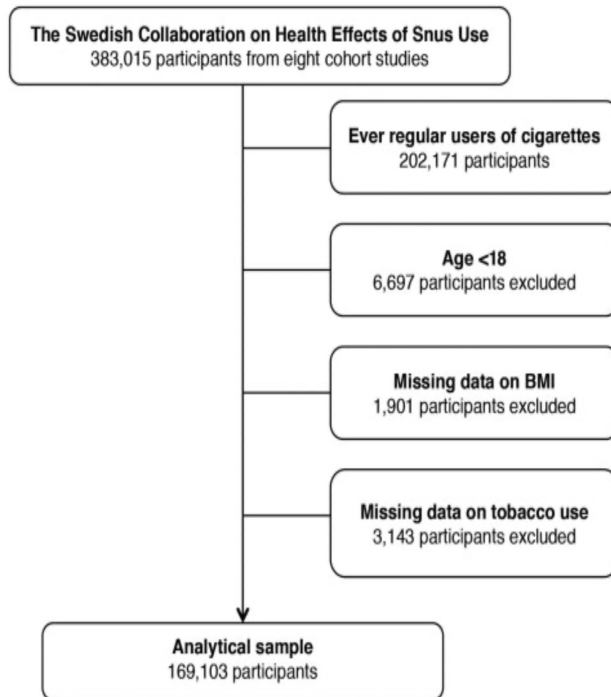
**Table 3** Pooled aHRs and 95% CIs of death according to cause and snus use at baseline

	Cause of death							
	All causes		Cardiovascular diseases		Cancer		Other causes	
	<i>n</i> <sup>a</sup>	aHR (95% CI) <sup>b</sup>	<i>n</i> <sup>a</sup>	aHR (95% CI) <sup>b</sup>	<i>n</i> <sup>a</sup>	aHR (95% CI) <sup>b</sup>	<i>n</i> <sup>a</sup>	aHR (95% CI) <sup>b</sup>
<b>Tobacco use</b>								
Never-users of tobacco	9272	Ref.	3444	Ref.	2660	Ref.	2098	Ref.
Exclusive current snus users	1410	1.28 (1.20–1.35)	443	1.27 (1.15–1.41)	332	1.12 (1.00–1.26)	511	1.37 (1.24–1.52)
Exclusive former snus users	246	1.15 (1.02–1.31)	83	1.13 (0.91–1.41)	82	1.26 (1.01–1.57)	69	1.14 (0.89–1.45)
<b>Amount (cans/week)<sup>c</sup></b>								
<4	415	1.28 (1.16–1.41)	166	1.44 (1.23–1.69)	102	1.13 (0.93–1.38)	109	1.24 (1.02–1.51)
4–6	429	1.17 (1.06–1.29)	141	1.18 (1.00–1.40)	116	1.17 (0.96–1.41)	140	1.18 (0.99–1.40)
≥7	528	1.37 (1.25–1.50)	125	1.17 (0.98–1.41)	98	1.01 (0.82–1.24)	253	1.65 (1.43–1.90)
<i>P</i> for trend		0.09		0.03		0.22		0.001
<b>Duration, years<sup>c</sup></b>								
<5	105	1.08 (0.88–1.32)	13	0.98 (0.56–1.72)	12	0.68 (0.38–1.21)	71	1.13 (0.87–1.45)
5–9	189	1.17 (1.00–1.36)	26	0.99 (0.67–1.48)	32	0.94 (0.65–1.35)	114	1.21 (0.99–1.49)
10–14	176	1.31 (1.12–1.52)	38	1.16 (0.84–1.61)	40	1.08 (0.79–1.49)	82	1.46 (1.16–1.84)
≥15	844	1.29 (1.20–1.38)	340	1.32 (1.18–1.48)	215	1.12 (0.97–1.29)	222	1.49 (1.30–1.72)
<i>P</i> for trend		0.001		0.001		0.11		0.001

<sup>a</sup>The numbers of cause-specific deaths do not add up to the total because of missing information regarding the cause of death.

<sup>b</sup>Adjusted for attained age and BMI.

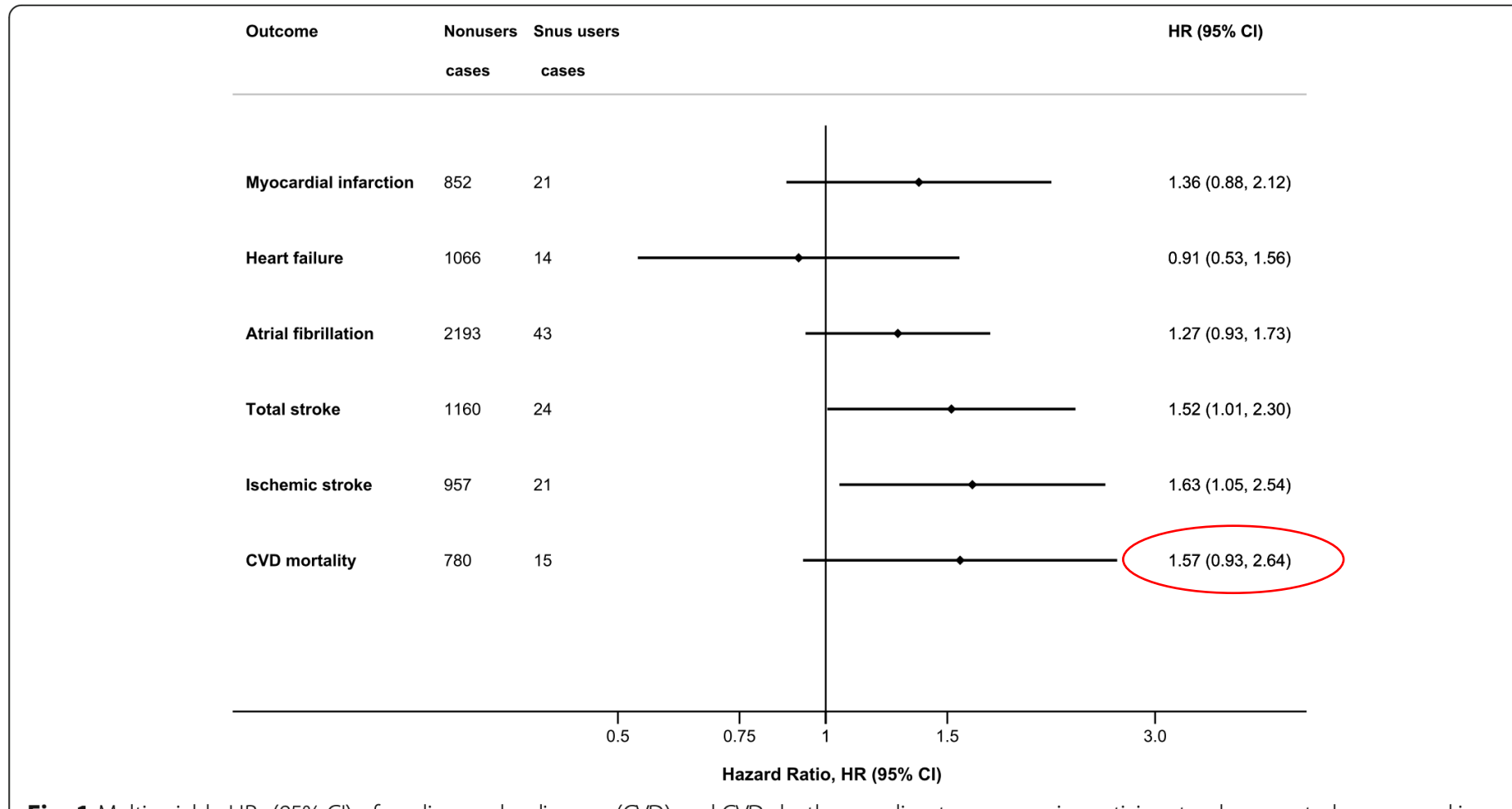
<sup>c</sup>Among exclusive current snus users only. Reference category is never-users of tobacco.



# Snus och mortalitet

Titova et al. *BMC Medicine*

(2021) 19:111



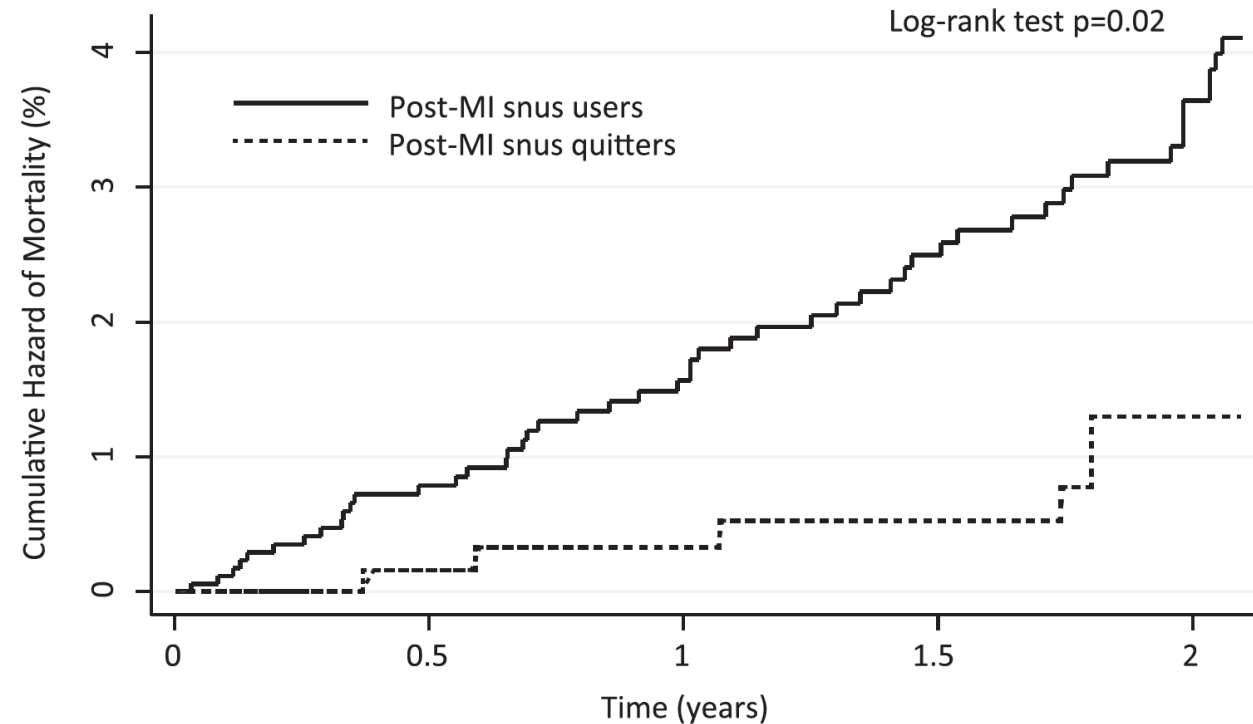
**Fig. 1** Multivariable HRs (95% CI) of cardiovascular diseases (CVD) and CVD death according to snus use in participants who reported never smoking cigarettes regularly. The Cox proportional hazards regression models were adjusted for age (underlying time scale), sex (as a stratification variable), education, alcohol consumption, walking/bicycling, exercise, body mass index, and history of hypertension, hypercholesterolemia, and diabetes. CI, confidence interval; HR, hazard ratio



# Snus och mortalitet (efter hjärtinfarkt)



Arefalk et al. (*Circulation*. 2014;130:325-332.)



Number at risk						
Post-MI snus users	1771	1534	1278	1083	873	
Post-MI snus quitters	672	615	517	445	344	

**Figure.** Cumulative Incidence of Total Mortality by Snus Exposure Categories in SEPHIA, a Cohort of Participants Recently (<2 months) Hospitalized for Myocardial Infarction.

# Snus och mortalitet (efter hjärtinfarkt)



Arefalk et al. (*Circulation*. 2014;130:325-332.)

**Table 2. Mortality Rate by Tobacco Exposure Category in Patients Recently (<2 mo) Hospitalized for MI in Sweden, 2005 to 2009**

Variable	PYAR	Cases, n	Model A	Model B	Model C	Model D
Snus exposure categories						
Post-MI snus users (n=1799)	3694	69	Reference	Reference	Reference	Reference
Post-MI snus quitters (n=675)	1450	14	0.51 (0.29–0.91)	0.55 (0.30–0.97)	0.57 (0.32–1.02)	0.55 (0.31–0.99)
Smoking exposure categories						
Post-MI smokers (n=2675)	5253	149	Reference	Reference	Reference	Reference
Post-MI smoke quitters (n=4259)	8864	120	0.50 (0.39–0.63)	0.50 (0.39–0.63)	0.54 (0.42–0.69)	0.54 (0.43–0.71)

Estimates presented in models A through D are hazard ratio (95% CI). Separate models are presented for snus and smoking exposure categories. MI indicates myocardial infarction; and PYAR, person-years-at-risk.

Model A: Adjusted for age and sex.

Model B: As model A but further adjusted for past and present smoking and snus exposure, respectively, by using 4-category tobacco exposure covariates (post-MI use, post-MI cessation, pre-MI cessation, and never-use).

Model C: Model similar to B but further adjusted for occupation status and participation in cardiac rehabilitation program. To minimize potential bias, the directed acyclic graph approach was used to identify the main model C.

Model D: Adjusted for age and a propensity score derived from the variables sex, smoking exposure (covariate similar to the one used in previous models), diabetes mellitus, hypertension, systolic and diastolic blood pressures, body mass index, waist circumference, low-density lipoprotein/high-density lipoprotein ratio, type of MI, occupation status, physical activity (4 levels), participation in cardiac rehabilitation program, treatment with aspirin, treatment with any other platelet inhibitor (primarily clopidogrel),  $\beta$ -blockers, statins, and renin-angiotensin-aldosterone system inhibitors (angiotensin-converting enzyme inhibitor or angiotensin 2 receptor blocker). These models were designed to account for long-term risk factors, as well as for differences in post-MI lifestyle changes and treatments, but were not identified by use of directed acyclic graphs and are therefore considered secondary, mechanistic models.

# Snus och hjärtkärleffekter

Ingen påvisad association till:

- Ultraljudsmätt gradering av åderförkalkning (Bolinder et al. 1997, Wallenfeldt et al. 2001)
- Incident hjärtinfarkt (Hansson et al. 2012, Titova et al. 2021)
- Incident stroke (Hansson et al. 2014, Titova et al. 2021)
  
- Däremot koppling till:
  - Fatal hjärtinfarkt och stroke (Boffetta et al. 2009, Hansson et al. 2012)
  - Katekolaminpåslag (Wolk et al. 2005)
  - Diastolisk dysfunktion (Sundström et al. 2012)
  - Endoteldysfunktion, artärstyvhet (Rohani et al. 2004, Antoniewicz et al. 2022)

# Snus och blodtryck

- Akut ökning i medelblodtryck med 10 mmHg, hjärtfrekvens med 16 slag/min.

Wolk R, et al. Hemodynamic and autonomic effects of smokeless tobacco in healthy young men. *J Am Coll Cardiol* 2005;45:910-4.

- En 43 % ökad risk för utveckling av högt blodtryck hos snusare (med normalt blodtryck vid baseline).

Hergens et al, *J Intern Med* 2008; 264: 187-194.

# Snus och hjärtsvikt

*Arefalk et al. Eur J Prev Cardiol. 2012;19:1120-1127.*

**Table 2.** Risk of heart failure in snus users relative to snus non-users in the Uppsala Longitudinal Study of Adult Men ( $n = 1076$ )

Variable	Cases	Age-adjusted model (A)	Main model (B)	Mechanistic model (C)
Snus non-use	81	Ref	Ref	Ref
Snus use	14	2.42 (1.37–4.27)	2.08 (1.03–4.22)	2.09 (1.00–4.39)

Values are hazard ratio (95% confidence interval). Model A: age-adjusted. Model B: as model A and further adjusted for current smoking dose, pack-years of smoking, diabetes, body mass index, occupational classification, alcohol use, and myocardial infarction before baseline. Model C: as model B and further adjusted for office systolic blood pressure, antihypertensive medication use, electrocardiogram-left ventricular hypertrophy and replacing myocardial infarction before baseline with myocardial infarction during follow up (as a time-dependent covariate).

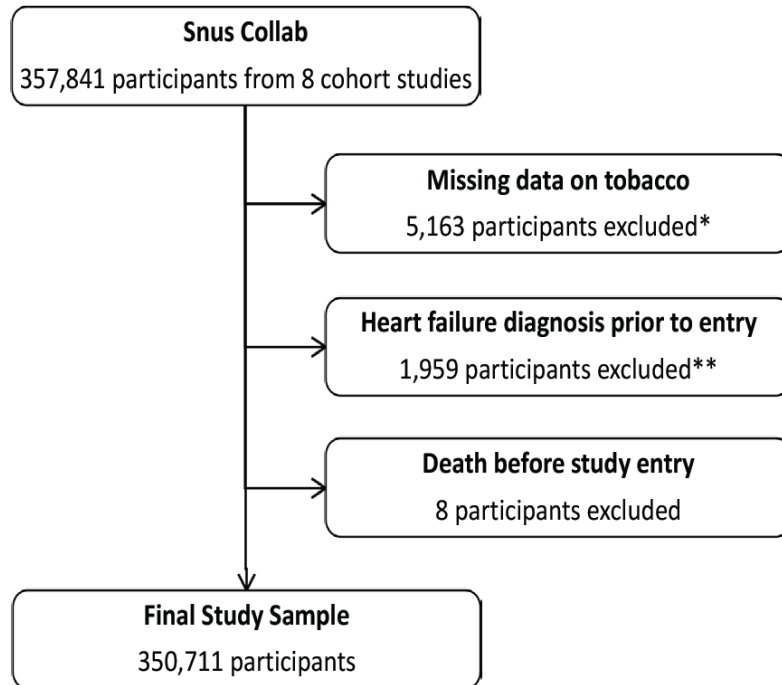
**Table 4.** Risk of heart failure by snus exposure categories among never-smoking male construction workers ( $n = 118,425$ )

Variable	Cases	Age-adjusted models (A)	Main model (B)	Mechanistic model (C)
Never tobacco use	464	Ref	Ref	Ref
Current snus use	75	1.35 (1.05–1.72)	1.28 (1.00–1.64)	1.24 (0.97–1.59)
< 12.5 g/day	28	1.19 (0.81–1.74)	1.18 (0.80–1.73)	1.15 (0.78–1.68)
12.5–24.9 g/day	35	1.57 (1.11–2.21)	1.46 (1.03–2.06)	1.40 (0.99–1.98)
25–49.9 g/day	8	1.13 (0.56–2.27)	1.03 (0.51–2.08)	1.02 (0.50–2.06)
≥ 50 g/day	4	1.48 (0.55–3.98)	1.25 (0.47–3.84)	1.24 (0.46–3.34)
<i>p</i> trend		0.9	0.9	0.9
Former snus use	6	1.02 (0.46–2.29)	1.00 (0.45–2.23)	0.99 (0.44–2.22)

Values are hazard ratio (95% confidence interval). Models A: age-adjusted. Model B: as model A and further adjusted for body mass index, region of residence and myocardial infarction before baseline. Model C: as model B and further adjusted for systolic and diastolic blood pressures and replacing myocardial infarction before baseline with myocardial infarction during follow up (as a time-dependent covariate).

# Snus och hjärtsvikt

Arefalk et al. Unpublished data.



**Table 8.** Risk of heart failure by tobacco exposure categories in Snus Collab

Exposure	PYAR	Cases	Hazard ratio (95 % CI)
Snus use			
Non-current use	4,268,604	4,644	Ref
Current use	1,384,156	760	1.27 (1.07-1.50)
Smoking			
Never	2,578,326	1,489	Ref
Former	1,241,434	1,735	1.23 (1.14-1.32)
Current	1,833,000	2,180	1.95 (1.82-2.11)
Snus use (current vs. non-current)			
Among never-smokers	2,578,326	1,489	1.25 (1.06-1.48)
Among previous smokers	1,241,434	1,735	1.00 (0.88-1.13)
Among smokers	1,833,000	2,180	0.87 (0.77-0.99)
Snus dose response analyses			
1 can/week	426,426	359	Ref
2-4 cans/week	673,952	293	1.51 (1.05-2.20)
5-6 cans/week	138,696	43	1.16 (0.60-2.24)
7 or more cans/week	106,460	34	2.23 (1.18-4.24)
Hazard ratio/higher category			1.25 (1.04-1.51)

Models include variables age (as timeline), smoking (never, former or current), snus use (current vs. non-current snus use in top panel; snus intensity in bottom panel), myocardial infarction before baseline, educational level and an interaction term for snus use × smoking status. Accordingly, estimates are marginal effects.

# Snus och hjärtsvikt

Arefalk et al. Unpublished data.

**Table 9.** Risk of subtypes of heart failure (ischemic and non-ischemic) by tobacco exposure categories in Snus Collab

Exposure	Outcome	
	IHF (1,835 cases / 350,711 at risk)	Non-IHF (3,569 cases / 347,745 at risk)
Snus use		
Non-current	Ref	Ref
Current	1.01 (0.72-1.42)	1.34 (1.11-1.63)
Smoking		
Never	Ref	Ref
Former	1.48 (1.30-1.69)	1.19 (1.08-1.30)
Current	2.43 (2.14-2.76)	1.81 (1.66-1.98)
Snus use (current vs. non-current) stratified on smoking status		
Among never-smokers	1.07 (0.76-1.51)	1.29 (1.06-1.57)
Among previous smokers	0.79 (0.63-1.00)	1.10 (0.94-1.27)
Among smokers	0.75 (0.61-0.93)	0.93 (0.80-1.10)

Data are hazard ratios with 95% CI. Models include variables age (as timeline), smoking (never, former or current), snus use (current vs. non-current), educational level and an interaction term for snus use × smoking status. Accordingly, estimates are marginal effects.

Är snus farligt?

1. Nej

2. Nja

3. Ja





# Sammanfattning

- Snusanvändningen ökar (drivs av unga kvinnor som använder nikotinsnus).
- Snus är associerat med ökad kardiovaskulär död och sämre prognos efter hjärtinfarkt.
- Snus förefaller ej öka risken för atherosklerotiska utfall.
- Snus (nikotin) har potenta hemodynamiska och kärlrelaterade effekter som skulle kunna förklara ökad risk för hjärtsvikt och kardiovaskulär död.

Tack!

