



# Waterpipe Use Among Young Adults is Predicted by Early Onset of Other Substance Use - Results from a Population-Based Cohort in Sweden

Seventh EUSPR Conference  
Berlin, Germany

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# Outline



- Waterpipe – global tobacco epidemic
- Rationale and objective of the study
- Study design, population
- Results
- Discussion
- Conclusion

# Waterpipe use and the global tobacco epidemic

- Rising popularity among youth globally
  - High prevalence of lifetime WP use (15-25 years old): Latvia (39%), Lithuania (34%), Denmark (34%), Sweden (33%)
  - Sweden (16-29 years old): 53% lifetime WP use, decreasing trend 2009-2013
- Attitudes, beliefs, attractiveness
  - Social interaction & acceptance
  - Less harmful compared with cigarettes
  - Less regulations: the device & tobacco itself



# Waterpipe use and the global tobacco epidemic

- Evidence on harms
  - One session of WP vs. one cigarette: larger volumes of smoke and toxicants inhaled
  - Transition to regular use of other tobacco products?
  - Marker of poly-substance use?
- Early predictors of WP use in young adulthood
  - Early age of smoking initiation
  - Tried smoking, marijuana or alcohol
  - Non-smoker or experimenter trajectory in high-school



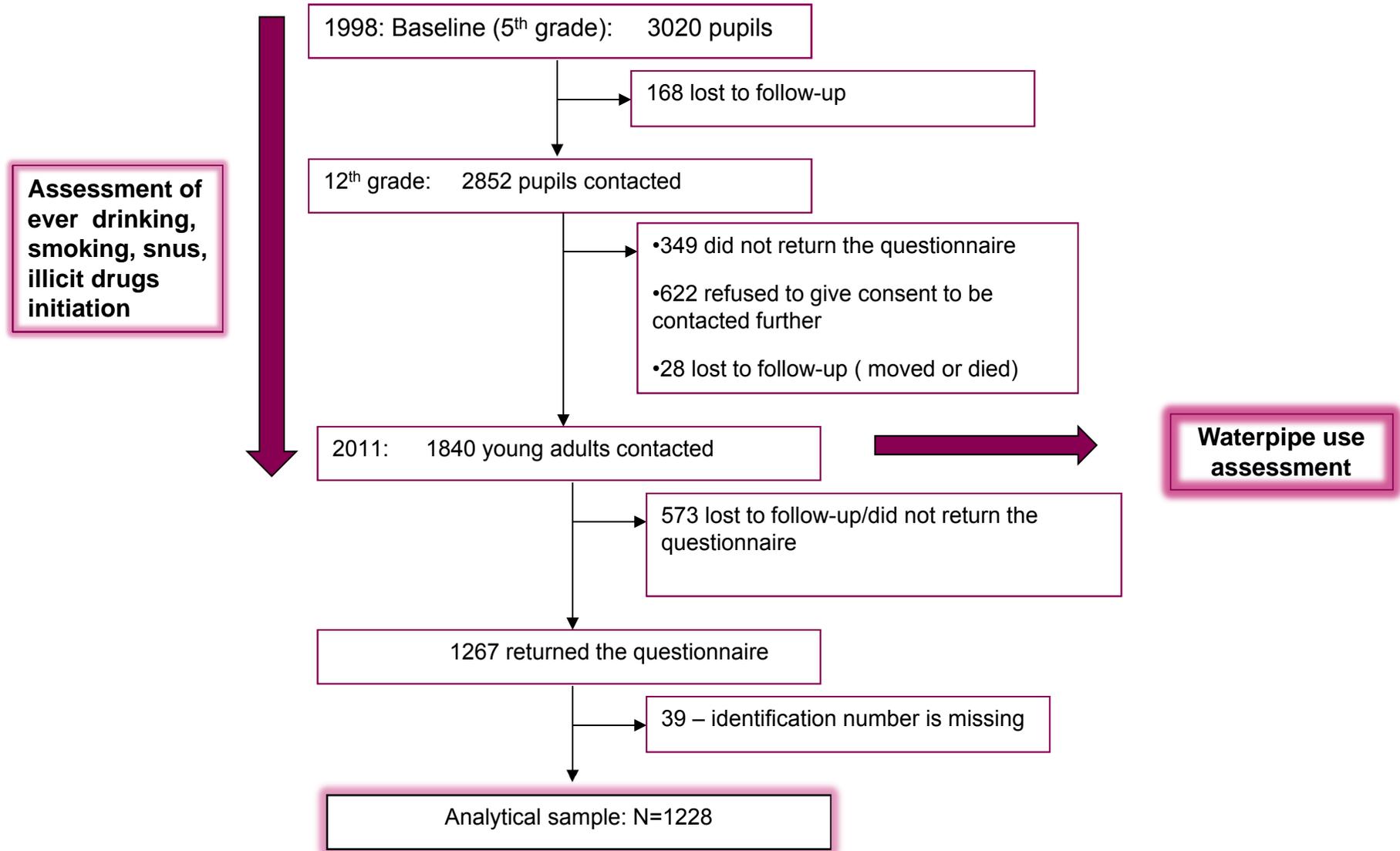
You inhale the equivalent of 200 cigarettes from just one hour of smoking shisha. Quit now.  
A public service message brought to you by GULF NEWS & GMASCO.

Khalid Radwan, Cesar Bautista, Cherry Koshy, Murali KT, Jagadish Arcot (2012), *Gulf News / GMASCO - Shisha kills*. Retrieved from [www.iqads.ro/creatie/25431/gulf-news-gmasco-shisha-kills](http://www.iqads.ro/creatie/25431/gulf-news-gmasco-shisha-kills)

# Aim

- To determine whether onset of alcohol drinking, tobacco and illicit drugs use is associated with waterpipe smoking in young adulthood.
- To determine whether early age at onset is a common feature of all these behaviours.

# BROMS Cohort Study (1998-2011)



# Methods



- Young adult sample
  - Average age 24 years old, 62% females, 50% had tertiary education, 6% daily smokers, 12% daily snus users
  - Compared with baseline sample:
    - Higher proportion of women, Swedish-born, at least one parent with university education, both parents employed and non-users of tobacco, never smokers by the 5<sup>th</sup> grade
  
- Outcomes – self-reported:
  - Primary: past-month WP use, recurrent past-year WP use
  - Secondary: lifetime WP use, early age at WP initiation
  
- Age at onset of other substances
  - Positive answer was given for the first time: smoked whole cigarette, tried snus, drunkenness episode, illicit drug use

# RESULTS



## Waterpipe Use Characteristics and Age at Onset of Substance Use Among Study Participants, the BROMS Cohort Study, 1998-2011



Variable <sup>a</sup>	No. (%)
Ever tried WP	879 (71.6)
Age at onset among those who <b>initiated WP</b>	
≤13	14 (1.6)
14-15	107 (12.2)
16-17	263 (30.0)
≥18	493 (56.2)
Past 30 days	
Once	39 (3.2)
≥ 2 times	15 (1.3)
Past 12 months	
Once	173 (14.1)
2-6 times	119 (9.7)
≥ 7 times	34 (2.8)
Age at onset among those who <b>initiated cigarette smoking, y</b>	
≤13	279 (30.1)
14-15	246 (26.6)
16-17	171 (18.5)
≥18	230 (24.8)
Age at onset among those who <b>initiated snus use, y</b>	
≤13	173 (21.3)
14-15	222 (27.3)
16-17	165 (20.3)
≥18	253 (31.1)
Age at onset among those who <b>had a drunkenness episode, y</b>	
≤13	155 (12.6)
14-15	468 (38.1)
16-17	334 (27.2)
≥18	133 (10.8)

# Association of early onset of cigarette smoking with WP smoking in young adulthood



	Waterpipe Past-Month Use	Waterpipe Recurrent Past-Year Use
	Crude OR (95% CI)	Crude OR (95% CI)
Yes	2.68 (1.14, 6.34)	5.95 (3.00, 11.83)
No	1	1
Age of onset, y		
≤13	1.50 (0.65, 3.47)	1.40 (0.88, 2.22)
14-15	1.71 (0.74, 3.95)	0.89 (0.54, 1.49)
16-17	1.05 (0.38, 2.87)	0.70 (0.38, 1.27)
≥18	1	1

# Association of early onset of snus use with WP smoking in young adulthood



	Waterpipe Past-Month Use	Waterpipe Recurrent Past-Year Use
	Crude OR (95% CI)	Crude OR (95% CI)
Yes	2.05 (1.04, 4.01)	2.08 (1.38, 3.13)
No	1	1
Age of onset, y		
≤13	0.39 (0.14, 1.07)	0.90 (0.53, 1.53)
14-15	1.01 (0.50, 2.03)	0.73 (0.44, 1.22)
16-17	0.32 (0.11, 0.97)	0.75 (0.43, 1.31)
≥18	1	1

# Association of early onset of drunkenness with WP smoking in young adulthood

	Waterpipe Past-Month Use	Waterpipe Recurrent Past-Year Use
	Crude OR (95% CI)	Crude OR (95% CI)
Yes	1.61 (0.57, 4.54)	2.89 (1.33, 6.31)
No	1	1
Age of onset, y		
≤13	1.55 (0.44, 5.40)	<b>2.44 (1.17, 5.13)</b>
14-15	2.13 (0.73, 6.17)	<b>1.98 (1.02, 3.86)</b>
16-17	0.99 (0.31, 3.23)	1.34 (0.66, 2.72)
18	1	1

# Early waterpipe use according to age at initiation of other substances

Age of onset, y	Crude OR (95% CI)
<b>Lifetime Cigarette Smoking by Age 24</b>	
≤13	2.42 (1.61, 3.63)
14-15	1.97 (1.30, 2.98)
16-17	1.49 (0.94, 2.35)
≥18	1
<b>Lifetime Snus Use by Age 24</b>	
≤13	2.43 (1.58, 3.75)
14-15	2.08 (1.39, 3.11)
16-17	2.10 (1.36, 3.27)
≥18	1
<b>Lifetime First Drunkenness Episode by Age 18</b>	
≤13	1.96 (1.10, 3.49)
14-15	1.83 (1.11, 3.04)
16-17	1.00 (0.58, 1.70)
18	1

# Discussion

- Early episodes of drunkenness and WP use (association)
  - Common liability to substance use/of commonalities of social settings and environments
  - Both socially acceptable behaviours in Sweden (contrast with cigarettes)
  - Social and enhancement motives → pattern of alcohol use (drunkenness to foster fellowship); socializing as a reason for waterpipe smoking;
- Early snus use and WP use (inverse association)
  - route of administration (sensibility of the upper respiratory tract to smoke)
- Early episodes of substance use cluster
  - Sensation seeking → increased levels 13-17 years old

# Discussion

- **Limitations**
  - 60% lost to follow-up, attrition differential, probably not related with the outcomes under study
  - Sample not representative of Swedish young adults regarding the behaviours studied (daily cigarettes smokers → under-represented)
  - Recent use of WP – rare → no power to detect weak associations as statistically significant
  
- **Strengths**
  - Prospective assessment of age at initiation of substance use (except WP)
  - Validation of self-reported tobacco use with bio-markers
  - Drunkenness better than drinking initiation to predict adolescent problematic behaviour; compatible with the drinking pattern in Sweden

# Conclusions

- Waterpipe use among Swedish young adults
  - General pattern of early poly-substance use behavior (psychobiological predisposition or shared environmental factors)
  - Preventive and educational programs should address this behavior as part of a global developmental phenotype

# Acknowledgements



- Rosaria Galanti, Karolinska Institutet, Stockholm, Sweden
- Zangin Zeebari, Karolinska Institutet, Stockholm, Sweden
- Stockholm County Council

# Thank you!



**Questions  
Comments  
Suggestions**



**Table 1.** Baseline Characteristics of Study Participants Compared to Non-participants, the BROMS Cohort Study (1998-2011)

Characteristics <sup>a</sup>	Participants (n=1228)	Non-participants (n = 1792)	P Value
Gender, No. (%)			
Female	765 (62.3)	718 (40.1)	< .001
Male	463 (37.7)	1074 (59.9)	
Age, mean (SD)	11.58 (0.33)	11.58 (0.34)	.748
Student ever smoked, No. (%)			
Yes	59 (4.8)	121 (6.9)	.024
No	1158 (95.2)	1645 (93.1)	
Student ever used <i>snus</i> , No. (%)			
Yes	58 (4.8)	105 (6.0)	.159
No	1155 (95.2)	1651 (94.0)	
Student ever used tobacco, No. (%)			
Yes	96 (8.0)	185 (10.6)	.015
No	1110 (92.0)	1555 (89.4)	
Parents' birth place, No. (%)			
Sweden	918 (75.4)	1252 (71.1)	.008
Other	299 (24.6)	510 (28.9)	
Parent's highest education, No. (%)			
Compulsory	48 (4.0)	120 (6.8)	< .001
Senior High School	374 (30.9)	606 (34.5)	
University	788 (65.1)	1031 (58.7)	
Parents' employment, No. (%)			
Neither	1 (0.1)	2 (0.1)	< .001
One	241 (20.9)	441 (27.0)	
Both	913 (79.0)	1188 (72.8)	
Parents' tobacco use, No. (%)			
Neither	625 (52.8)	791 (46.2)	< .001
One	391 (33.0)	619 (36.2)	
Both	168 (14.2)	301 (17.6)	