



# Use of alcohol, tobacco and illicit drugs: a cause or an effect of mental ill health in adolescence?

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# Introduction

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- Adolescents as a group are particularly vulnerable to mental health problems. In particular, the occurrence of mental health problems among Swedish adolescents has increased since the 1980s, particularly among girls.
- Mental health and behavioral disorders account for 30% of the total burden of disease in adolescents and young adults from 15 to 29 years of age in the World Health Organization European Region.

# Introduction

- Unhealthy behaviors such as alcohol drinking, tobacco smoking, and drug use start more commonly during adolescence than at other developmental stages.
- The drug-use disorders account for 12% of the psychological disease burden in adolescents.

The cause-effect relationship between substance use and mental health is still unresolved:

- substance use and mental health problems may be the consequences of shared risk factors;
- adolescents may use substances to cope with anxiety or depression;
- substance use may determine subsequent mental health problems.

# Introduction

Which came first, the egg or the chicken?  
tobacco smoking or depression?



## Aims

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# Aims

The aims were to assess:

- the percentage of students using **drugs, tobacco** and **alcohol** at baseline;
- the percentage of students with **mental health problems** at baseline;
- the association between **mental health at baseline** and **substance use at 1-year** of follow-up;
- the association between **substance use at baseline** and **mental health at 1-year** of follow-up.



# Methods

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In the first part of the analysis we calculated the proportion of students in the 7th grade cohort using **drugs**, **tobacco** and **alcohol**, and the proportion of students with **mental health problems** at baseline.

The longitudinal analysis encompassed two different analyses, based on a sub-sample of the cohort with complete 1-year follow-up.

- The associations between students' **substance use** at baseline (*exposure*) and students' **mental health** at follow-up (*outcome*) excluding students with prevalent mental problems at baseline [part-1].
- The associations between students' **mental health** at baseline (*exposure*) and students' **substance use** at the end of the follow-up (*outcome*) excluding students with substance use at baseline [part-2].

# Methods - Study design

## Data used in the analysis

	Year 1	Year 2	Year 3	Year 4	Year 5
Academic year	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Sample 1	Baseline 7th grade	Follow up 1 8th grade	Follow up 2 9th grade	Follow up 3 Post-secondary school: year 1	
Sample 2		Baseline 7th grade	Follow up 1 8th grade	Follow up 2 9th grade	Follow up 3 Post-secondary school: year 1

## Students' substance use

- Lifetime substances use (cigarette smoking, alcohol consumption, snus use, illicit drugs use)
- Lifetime cigarette smoking
- Alcohol consumption in the past 12 months

## Alkohol, narkotika och tobak

6. Hur många cigaretter har du rökt sammanlagt i ditt liv?

0 (aldrig rökt, gå till fråga 9)  
 1-10  
 11-20  
 mer än 20

7. Hur många av de senaste 30 dagarna har du rökt cigaretter?

Om du inte rökt alls skriv "0"

8. Hur många cigaretter har du i genomsnitt rökt per dag de dagar du rökte under de senaste 30 dagarna?

Om du inte rökt alls eller bara tagit några bloss, skriv "0"

9. Hur många gånger har du snusat sammanlagt i ditt liv?

0 (aldrig snusat, gå till fråga 12)  
 1-10  
 11-20  
 mer än 20

10. Hur många av de senaste 30 dagarna har du snusat?

Om du inte har snusat alls skriv "0"

11. Hur många snusprillor har du i genomsnitt använt per dag de dagar du snusade under de senaste 30 dagarna?

Om du inte har snusat alls skriv "0"

12. Har du någonsin känt att du är/var beroende av cigaretter eller snus?

Nej  
 Ja

13. Hur många gånger har du använt hasch (marijuana, cannabis) sammanlagt i ditt liv?

0 (aldrig använt, gå till fråga 15)

1-2  
 3-5  
 6-10  
 mer än 10

14. Har du använt hasch (marijuana, cannabis) de senaste 30 dagarna?

Nej  
 Ja

15. Har du någonsin använt andra illegala droger (t.ex. kokain, ecstasy, amfetamin)?

Nej  
 Ja

16. Hur ofta under de senaste 12 månaderna har du druckit alkohol (öl, alkohölsk, starkider, vin eller sprit)?

Aldrig  
 En gång om året  
 2-10 gånger om året  
 En gång i månaden  
 2-3 gånger i månaden  
 En gång i veckan  
 Två gånger i veckan  
 Varannan dag  
 Varje dag

17. Hur ofta under de senaste 12 månaderna har du druckit så mycket alkohol att du känt dig berusad?

Har inte druckit alkohol/Har inte varit berusad  
 Några gånger under året, men inte varje månad  
 1-3 gånger i månaden  
 Någon gång i veckan

18. Hur ofta under de senaste 12 månaderna har det hänt att du drack alkohol motsvarande minst 18 cl sprit (en halv kvartel) eller en helflaska vin eller fyra stora flaskor starkider/alkohölsk eller 4 burkar starkölsk eller sex burkar folköl vid samma tillfälle?

Har inte druckit alkohol/Har inte druckit så mycket  
 Några gånger under året, men inte varje månad  
 1-3 gånger i månaden  
 Någon gång i veckan

### Students' mental health

- Strengths and Difficulties Questionnaire (SDQ)
- Center for Epidemiologic Studies **Depression Scale** for Children (CES-DC)

- We carried out a descriptive analysis of the baseline characteristics of the cohort.
- The causal relationship between the students' mental health and substance use was evaluated through logistic regression models.
- The models were adjusted for parental employment, education level and parental substance use.

## Statistical program

STATA



# Results

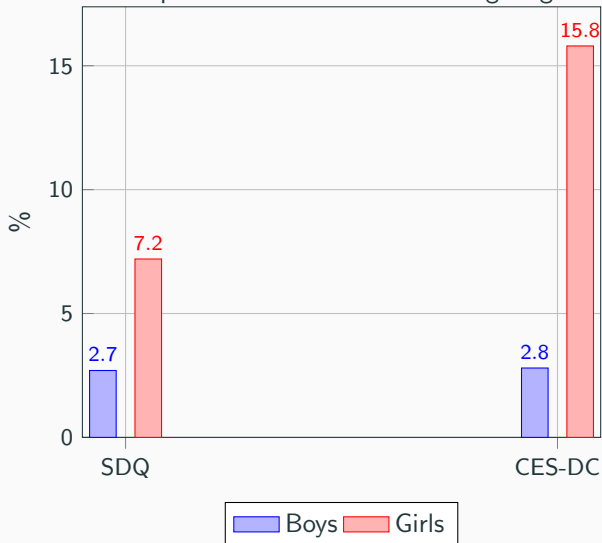
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## Results - Cross-sectional analysis

- **3671** school children were included (48.2% boys)
- Scale scores indicating mental health problems were found among **5%** of the participants using the SDQ and among **9.6%** using the CES-DC.

## Results - Cross-sectional analysis

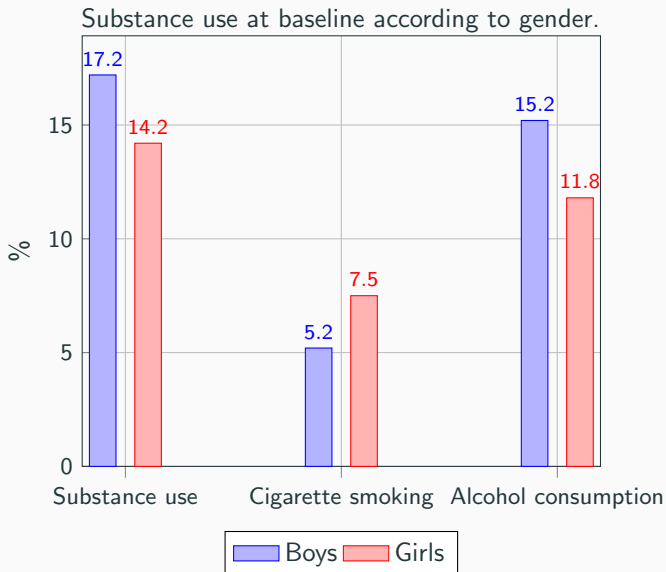
Mental health problems at baseline according to gender.



## Results - Cross-sectional analysis

- The prevalence was:
  - **15.6%** for lifetime substance use
  - **6.4%** for cigarette smoking
  - **13.4%** for alcohol consumption in the past 12 months
  
- Among ever smokers, **75.5%** smoked 10 or less cigarettes.
  
- Among students with alcohol consumption in past 12 months, **56.2%** used alcoholic beverage only once in a year, and **2.7%** got drunk at least once in a year.

## Results - Cross-sectional analysis



## Results - Longitudinal analysis (part 1)

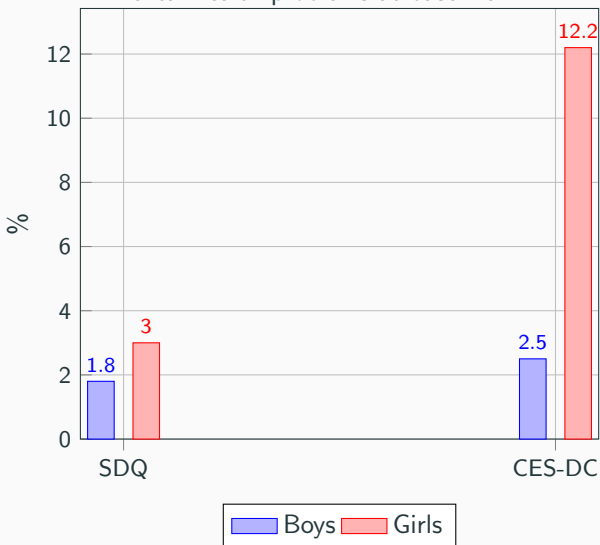
Substance use at baseline  Mental health at 1-year

## Results - Longitudinal analysis (part 1)

A total of **1431** school children (52.1% boys) of the first sub-cohort without self-reported mental health problems at baseline according to SDQ and CES-DC scale were included in this analysis.

## Results - Longitudinal analysis (part 1)

Mental health problems at 1-year of follow-up in adolescents without mental health problems at baseline.





**Relative risk** provides information about the risk of developing an outcome in those who have a certain condition (**exposure**) compare to those without it.

$$RR = \frac{R_{with\ exposure}}{R_{without\ exposure}}$$

## Results - Longitudinal analysis (part 1)

**Table 1:** Relative risks (RRs) for SDQ and CES-DC indicative of mental health problems scale at 1-year of follow-up adjusted social-economic status.

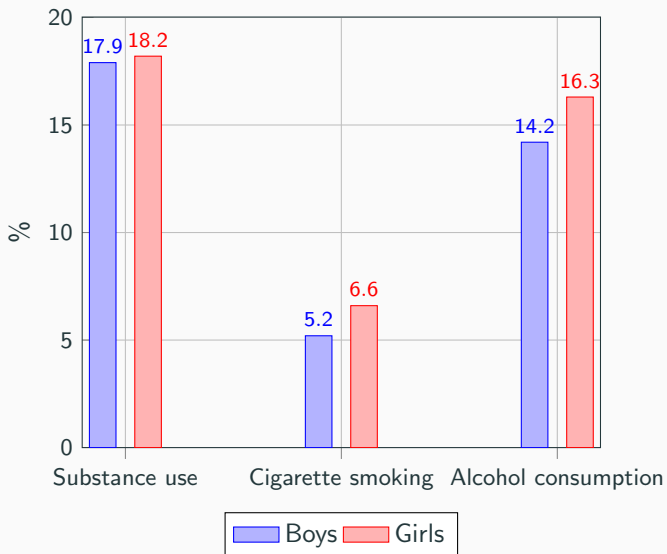
	SDQ	CES-DC
<b>All</b>		
Substance use (yes vs no)	<b>3.28</b>	<b>2.53</b>
Cigarette smoking (yes vs no)	<b>4.84</b>	<b>3.21</b>
Alcohol consumption(yes vs no)	1.75	<b>2.20</b>
<b>Girls</b>		
Substance use (yes vs no)	<b>3.50</b>	<b>3.06</b>
Cigarette smoking (yes vs no)	<b>4.09</b>	<b>3.54</b>
Alcohol consumption(yes vs no)	1.28	<b>2.43</b>
<b>Boys</b>		
Substance use (yes vs no)	3.26	1.33
Cigarette smoking (yes vs no)	<b>6.26</b>	1.95
Alcohol consumption(yes vs no)	2.57	1.61

## Results - Longitudinal analysis (part 2)

Mental health at baseline  Substance use at 1-year

## Results - Longitudinal analysis (part 2)

Substance use at 1-year of follow-up in adolescents without lifetime substance use at baseline.



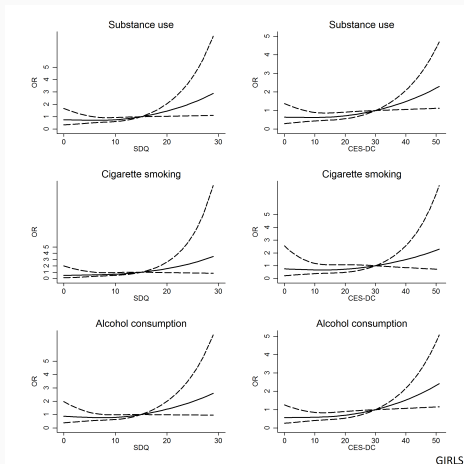
## Results - Longitudinal analysis (part 2)

**Table 2:** Relative risks (RRs) for substance use, cigarette smoking and alcohol consumption at 1-year of follow-up adjusted for social-economic status and parents' substance use.

	Substance use	Cigarette smoking	Alcohol consumption
<b>All</b>			
SDQ normal	1	1	1
SDQ borderline	1.41	1.11	1.21
SDQ abnormal	<b>2.34</b>	<b>3.42</b>	<b>2.36</b>
CES-DC (abnormal vs normal)	<b>1.77</b>	2.03	<b>1.95</b>
<b>Girls</b>			
SDQ normal	1	1	1
SDQ borderline	1.27	0.78	1.33
SDQ abnormal	<b>2.52</b>	<b>3.85</b>	2.14
CES-DC (abnormal vs normal)	<b>1.91</b>	1.83	<b>2.03</b>
<b>Boys</b>			
SDQ normal	1	1	1
SDQ borderline	1.64	1.85	0.88
SDQ abnormal	1.92	1.83	2.64
CES-DC (abnormal vs normal)	1.27	2.78	1.21

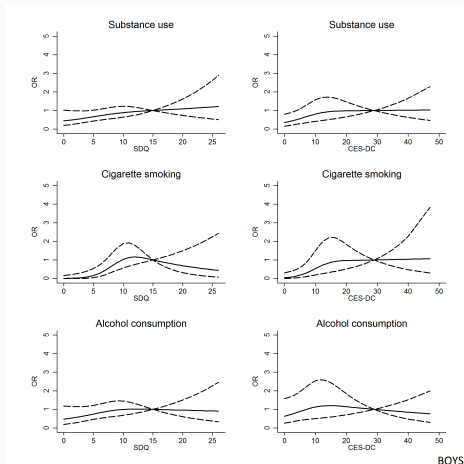
## Results - Longitudinal analysis (part 2)

Associations of SDQ and CES-DC at baseline with substance use at 1-year of follow-up in girls.



## Results - Longitudinal analysis (part 2)

Associations of SDQ and CES-DC at baseline with substance use at 1-year of follow-up in boys.



## Conclusion

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# Conclusion

- We found bidirectional associations between mental health problems and substance use in adolescents
- These associations differ across males and females according to the outcome considered.
- The psychological and/or biological mechanisms underlying these associations should be the focus of additional research.

**TACK!**