Tobacco use: studies of onset and cessation

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PETTER DASS (1647-1707) OM TOBAKKEN

Kvindernes Næsebors Porte
Er derfor deilige sorte,
Ligesom Skorstene
Saa rene,
Hjertens vakker Snud,
O, du lede Krud!
Er din Tobaks-Stud
Ei snart tømmet ud?
Bruger du det længe,
For Penge
Kommer du nok vist til at trenge.

Slutningen denne skal blive:
Herre Gud Kornet os give!
Snus og Tobaks-Studen
Foruden
Vi vel være kan.
Gud velsigne Land,
Hav og Fjord og Strand!
Oplad milden Hand,
At den fattig Bunde
Han kunde
Nyde din' Velsignelser runde!

Kilde: Fra "Den nordske Dale –Vise", København 1683.

Summary

Background: The smoking prevalence in Norway has been declining since the 1960s among men and since the 1990s among women. Influencing premises may have been, among others, the advertising ban for tobacco products introduced in Norway in 1975 and a smoking ban in Norwegian restaurants and bars from 2004. Today less than one in five are daily smokers with very similar rates for men and women. However, with 17% daily smokers and 8% daily snus users in 2011 (age 16-74), effective tobacco prevention, including cessation strategies are still required. Today, daily smoking is known to be negatively associated with social class, and the gap between the social groups is widening rather than narrowing. Less is known about the social distribution of snus use. Young Norwegians often use both cigarettes and snus, or alternate between both types of tobacco. Snus use is steadily increasing among adolescents and young adults, and may act as a facilitator for smoking. On the other hand, snus use may contribute to smoking cessation in adults. The use of snus is known to be less harmful than cigarette smoking, but the evidence of health risks is not consistent. Knowledge about factors contributing to changes in tobacco use is important for preventive strategies, including the design of tobacco cessation programs.

Aim: To increase the knowledge about factors contributing to initiation and cessation of the use of tobacco products during the life course.

Material and methods: The papers are based on questionnaires from three health surveys. Firstly, in the Akershus Health Survey from 1998, 11,919 persons aged 16-80 were invited per mail (Paper I). The response rate was 65%. Self-reported reasons for smoking cessation in 1,715 ex-smokers were collected. Secondly, the 2000-2004 school based Youth Study invited 10th graders in six counties and 15,931 pupils (87%) participated (Paper II). Thirdly, in the longitudinal Youth Study 5,750 (89%) 10th graders in Oslo and Hedmark counties participated in the school-based baseline survey in 2001 and 3317 (58%) participated both in the school-based and the postal follow-up survey in 2004 (Paper III). Table analysis was used on all data to find differences between categories, additionally; multivariate logistic regression was applied in paper I, as well as linear binomial regression in paper II and multinomial logistic regression in paper III.

Results:

Concern for own health was the main reason for smoking cessation for both men and women, and a high proportion reported disliking addiction as a reason to quit smoking. Men were more likely to have stopped smoking to improve physical fitness while women rather stopped smoking out of consideration for their children. High age, short education, and physical health problems were associated with smoking cessation because of own disease, while high income and good physical health were associated with smoking cessation because of disliking addiction. In young women, high education was associated with cessation because of own pregnancy. In both sexes young age and living alone was associated with smoking cessation for financial reasons. Young men with low fat intake, who frequently exercised, had stopped smoking to improve physical fitness. Those who had stopped smoking in order to become fit and healthy seemed largely to have succeeded in their objective of smoking cessation.

In 16 year old 10^{th} graders daily smoking was positively associated with planned vocational rather than academic education, and also with living in a single parent family, and poor self-reported family economy. Occasional smoking showed similar, but weaker, associations with these factors. For snus use (daily or occasionally), the associations with educational ambitions resembled those of occasional smoking. Boys with parents from countries with a majority of Muslims had increased risk of daily smoking compared to Norwegian boys. Girls with the corresponding immigrant background had lower risk of smoking than girls with non-Muslim background.

In the follow-up study, using snus and not smoking at baseline (age 16) was not associated with increased risk of smoking only at follow-up (age 19). However, using snus at age 16 was associated with increased risk of dual use of both smoking and snus at age 19, adjusted for known risk factors.

Conclusions:

Among adults, ex-smokers most often reported concern for own health and disliking addiction as reasons for quitting smoking. Other frequently reported reasons were the wish to improve physical fitness among men, and consideration for their children among women. Most reasons for smoking cessation were positively associated with long education, high income or good self-reported physical health status.

Tobacco use at age 16 was mainly associated with low educational ambitions, less affluent self-reported family economy and living in a single parent family.

Snus use at age 16 may act as a facilitator to initiating smoking, as 16 years old male snus users had an increased risk of using both snus and cigarettes at age 19.

Acknowledgements

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However, the work started at The Norwegian Health Services Research Centre (HELTEF) in 1998 under the leadership of the Director Bjørn Guldvog, as I performed the health survey in Akershus and thereby collected the data for the first article. I will also thank Else Karin Kogstad, Leader of Centre for Health Promotion at the Akershus University Hospital and Frode Gallefoss, Professor dr. med. at Hospital Sørlandet/ University of Bergen for valuable advice regarding the questions on reasons for smoking cessation. Saga Høgheim and Tomislav Dimoski were, each in their own area, important key persons in the data collection and were both very helpful and hard working. Without the many fruitful discussions at HELTEF, and especially the enthusiasm and initiative of Knut Stavem to write the first article, I would never have started this work later on.

Sidsel Graff-Iversen has been my boss at the next working place, the National Health Screening Service, and a very inspiring and always encouraging colleague for many years. Later, at the NIPH, it was an easy choice to ask her to become my chief supervisor for this work. I am also very thankful for the contribution from my two co-supervisors, Lisa Forsén and Knut Stavem. Lisa has been invaluable when I needed her for methodological questions and discussions and Knut ensured continuity through his substantial contributions to both the first and the third article. I will also like to thank the other co-authors, Hein Stigum and Ragnhild Hovengen, for help and support. We have been solving a lot of problems and we had many and interesting discussions during the research period.

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I would also like to thank my family, not least my adult children Halldis and Matthias, and supportive and interested friends both private and at work that have patiently followed the progression of my work.

List of papers

Paper I:
Association between age, gender and reasons for smoking cessation
Grøtvedt L, Stavem K
Scandinavian Journal of Public Health, 2005; 33:72-76

Paper II:

Social differences in smoking and snuff use among Norwegian adolescents: a population based survey

Grøtvedt L, Stigum H, Hovengen R, Graff-Iversen S

BMC Public Health, 2008; 8:322

Paper III:

Patterns of snus and cigarette use: a study of Norwegian boys followed from age 16 to 19

Grøtvedt L, Forsén L, Stavem K, Graff-Iversen S

Accepted by Tobacco Control 06.03.12

Abbreviations and explanations

CI	Confidence Interval (95% level)
COPD	Chronic Obstructive Pulmonary Disease
GP	General Practitioner
HELTEF	The Norwegian Health Services Research Centre, today a part of the Norwegian Knowledge Centre for the Health Services
MCS	Mental Component Summary scale of the Short Form 36
NIPH	The Norwegian Institute of Public Health
OR	Odds Ratio
PCS	Physical Component Summary scale of the Short Form 36
RBUP	The Centre for Child and Adolescents Mental Health
RD	Risk Difference
RRR	Relative Risk Ratio
SES	Socioeconomic Status
SF-36	The 36-Item Short Form Survey of health related quality of life
SDQ	Strength and Difficulties Questionnaire
Snus	A non-fermented, moist and smokeless tobacco product marketed in Norway and Sweden, also called Swedish snus
ST	Smokeless Tobacco. Snus is one of several ST products marketed
UNGHUBRO	The Oslo Health Study (2000-2001) among 10th grade pupils in Oslo (HUBRO=eagle owl, acronym for the Norwegian title of the Oslo Health Study)

UNGOPPHED The Health Study (2000-2002) among 10th grade pupils in Oppland and Hedmark

1. Introduction

Calculations for 2003 showed that smoking was responsible for 6700 deaths yearly, 16 % of all deaths in Norway, mainly due to lung cancer and cardiovascular diseases.[1] New calculations for the year 2009 showed a decrease in the number of yearly deaths to 5100 deaths and 13% of all deaths (personal communication from SE Vollset and R Selmer, January 2012). This reduction has to do with the declining smoking prevalence during the last decades in Norway, as in most other Nordic and Western countries.[2;3] An advertising ban for tobacco products was introduced in Norway in 1975, and a ban on cigarette smoking in restaurants and bars in 2004. Norway and Scandinavia now have marked socio-economic differences in smoking and in mortality from COPD and lung cancer.[2;4-6]

The use of snus and other kinds of smokeless tobacco (ST) is considered to be less harmful than cigarette smoking, but the evidence of health risks is not consistent. ST has a carcinogenetic effect and has been associated with a substantial risk of oral cancers in India.[7;8] High consumption of Swedish snus has been associated with metabolic syndrome, independent of smoking status.[9] On the other hand no excess risk of ischemic heart disease and stroke was found among snus users.[10] One review has concluded that there is limited epidemiological evidence about the health effects of snus; another review indicated increased risk of myocardial infarction and cancer, assessing experimental evidence from animal studies in addition to research in humans. Both reports concluded, however, that snus use causes nicotine dependence.[11;12] The latest report about the health effects of ST was published by the Scientific Committee in the European Union, and concluded that ST products are addictive and hazardous to health. ST products contain various levels of toxic substances. The relative trends in progression from ST products into and from smoking were found to differ between countries. They also concluded that it is not possible to extrapolate the patterns of tobacco use from one country where oral tobacco is available to other countries due to societal and cultural differences.[13]

On this background, in spite of the in general positive trends of daily smoking, research on tobacco cessation and research on risk factors for tobacco use is needed. The reasons are several:

- The social inequalities in daily smoking are considerable and increasing. [2;14;15]

- The prevalence of occasional smoking is not declining and was about 10% among all adults and 15% among 16-24 years olds in the last decade.[16]
- Use of snus is increasing, especially among young people. Among men below 35 years the prevalence of snus use is higher than the prevalence of smoking.[16]

1.1 National strategy for tobacco control

In Norway's National Strategy for Tobacco Control 2006-2010,[17] the main goal is described as the promotion of health in all parts of the population and ensuring more years of healthy life by reducing the use of tobacco. Eight strategic areas are pointed out, with special emphasis to high-risk groups:

1. Tobacco prevention among young people
2. Smoking cessation
3. Protection from exposure to tobacco smoke
4. Reversing the increasing consumption trends for smokeless tobacco
5. Research, monitoring and evaluation
6. Information strategies and general communication
7. Tobacco control as a part of local public health activities
8. Tobacco control in an international perspective

A new strategy will be implemented in 2012, after evaluating the National Strategy 2006-2010.[18]

1.2 The tobacco epidemiology in Norway

Smoking began to decrease among Norwegian men in the beginning of the 1960s, and among women not before the end of the 1990s.[16] Alan D. Lopez was the first to describe the diffusion of smoking in populations in four distinctive stages or tobacco consumption patterns[15;19]:

- Stage one: steep rise of smoking prevalence in the male population
- Stage two: increase of female smokers, and 50% or more increase of male smokers
- Stage three: a plateau and a slow decrease in smoking among males, plateau in females

- Stage four: a plateau and decrease of prevalence among females, further decrease among males, but large and often increasing SES differences.

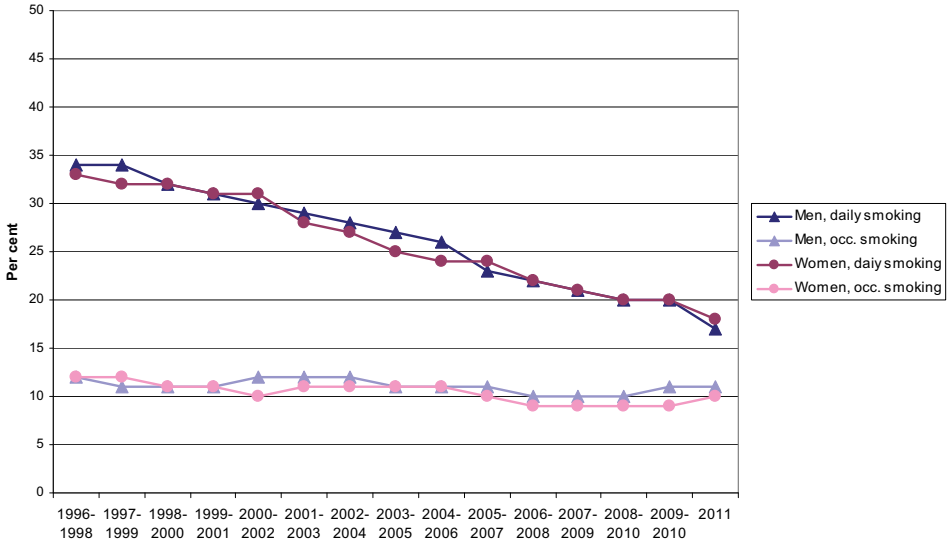
These trends are followed by similar patterns in smoking attributable mortality two to three decades later. Two well established aspects of the diffusion of smoking in western countries are 1) the lag in the adoption of smoking habits between men and women, and 2) the diffusion lag between higher and lower socioeconomic groups.[14]

The prevalence of snus use first increased among young men, then it started to increase also among young women, but the further stages of the consumption pattern are not yet clear. Perhaps it will be possible to describe stages similar to smoking in the diffusion of snus use in the Scandinavian countries in the future.[20]

The prevalence of daily smoking is still declining, and was in 2011 17% for men and 16% for women in the age group 16-74. In the youngest age group, 16-24, the prevalence of daily smoking was 9% for men and 13% for women (fig.1-2). The prevalence of daily snus use is increasing, and was in 2011 13% for men and 3% for women in the age group 16-74, and 25% for men and 11% for women in the youngest age group (fig. 3-4).

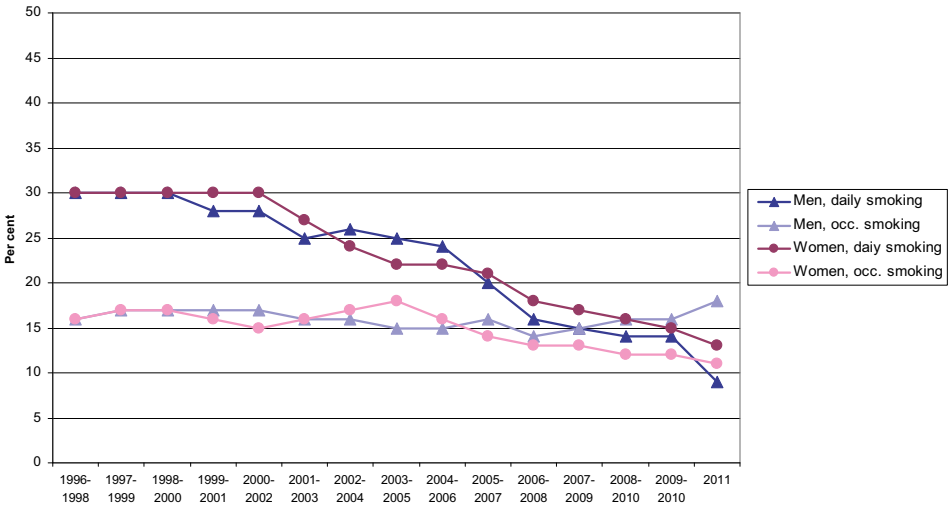
Four surveys per year are collecting data on tobacco use in the adult population up to 75 years of age, and the results are pooled together to make the yearly tobacco rates (Directorate of Health /Statistics Norway). The data on tobacco use in the population above age 74 may be obtained for the Level of living surveys every 3-4 years, but this is not a part of the official Norwegian statistics on tobacco (Statistics Norway).

Figure 1. Daily and occasional smoking in adults 16-74 years in Norway 1996-2011.



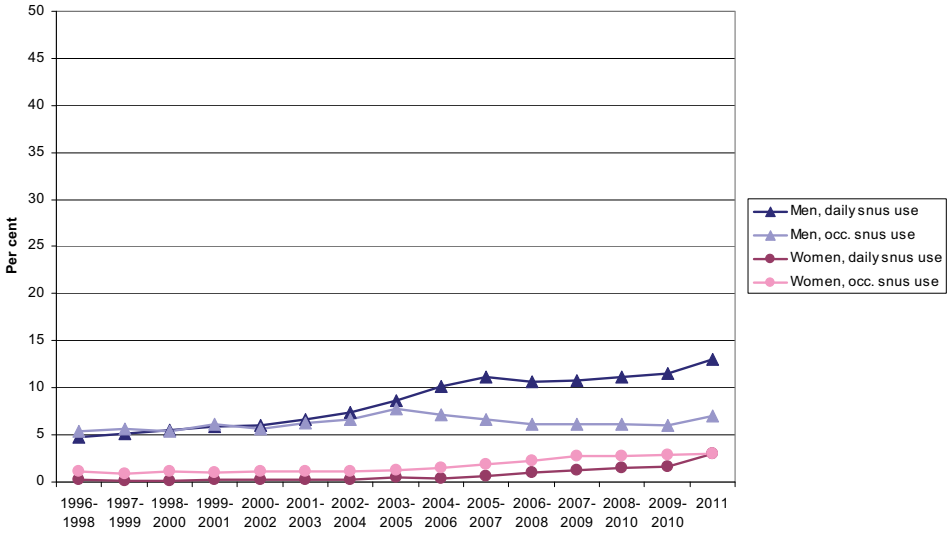
Source: Statistics Norway and The Norwegian Directorate of Health

Figure 2. Daily and occasional smoking in young adults 16-24 years in Norway 1996-2011.



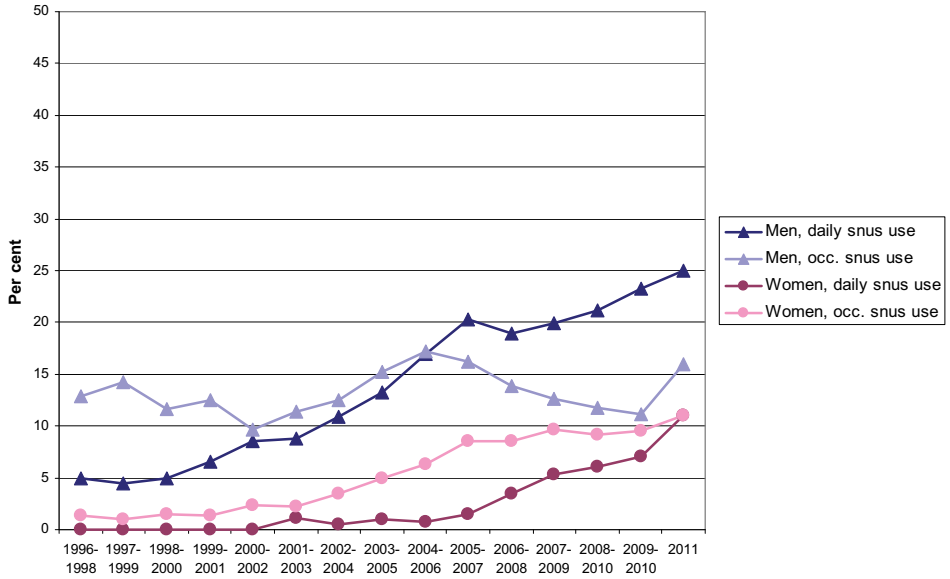
Source: Statistics Norway and The Norwegian Directorate of Health

Figure 3. Daily and occasional snus use in adults 16-74 years in Norway 1996-2011.



Source: Statistics Norway and The Norwegian Directorate of Health

Figure 4. Daily and occasional snus use in young adults 16-24 years in Norway 1996-2011.



Source: Statistics Norway and The Norwegian Directorate of Health

1.3 The socio-demography of tobacco

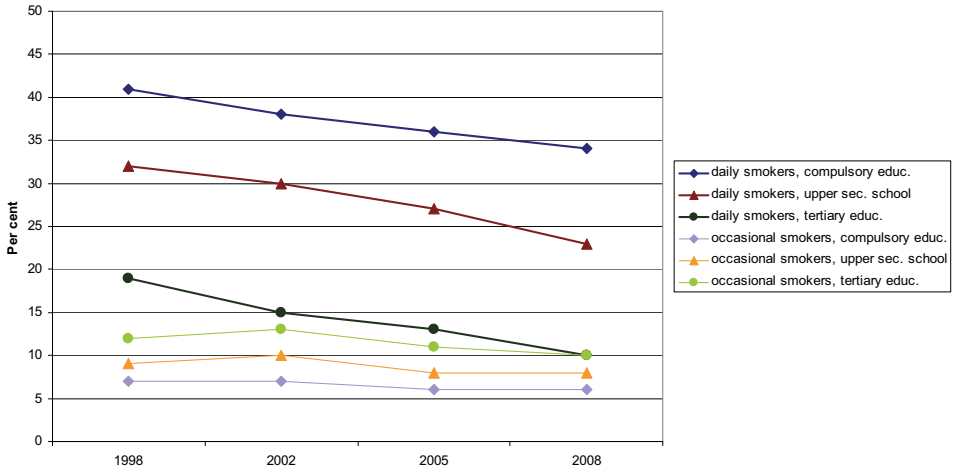
In Western countries, daily smoking is known to be negatively associated with SES, also among young people and adolescents.[14;21] Also in Norway, corresponding differences between SES groups and smoking were found.[20;22] The highest national smoking rates are found in North Norway.[16] The association of snus and occasional smoking with SES has been less clear. A Swedish study pointed out an increase in snus use among well educated urban young people.[11] Compared with smoking, the use of snus seemed to differ less by SES and more by region. Adolescent minority groups in Oslo used less snus than adolescents with Norwegian parents.[12;20;23] Knowledge about prevalence rates, risk- and protective factors for smoking behaviour among indigenous Sami and non-Sami adolescents and young adults in North Norway exists,[24-26] however, little is known about the use of snus and combinations of snus and smoking in the adolescent Sami population in North Norway. Only minor differences were found among adult Sami and non-Sami residents in Finnmark, a county with generally high smoking rates.[27] Among adults, the rate of male smoking was high in some immigrant groups living in Norway, while the rate of female smoking usually was very low. The highest proportion of daily smokers was found among men from Turkey, Iraq, Iran, Pakistan, Serbia-Montenegro, Bosnia-Herzegovina and Vietnam, while women from Chile, Turkey, Iran and Serbia-Montenegro smoked the most.[28;29]

The educational differences in smoking in Norway are considerable, and the differences seemed to remain over time (fig. 5). The lowest daily smoking rates were found among those with university or high school (tertiary education) and the highest rates among those with compulsory education. This gradient turned to the opposite regarding occasional smoking rates, with the lowest rates among the less educated. It has been shown that people in lower SES groups starts smoking earlier in life, are using more harmful tobacco products, are more exposed to second hand smoke and have lower quitting rates than those in higher SES groups.[22]

For daily snus use, data for educational differences were available for the years 2008-2011 and show a pattern similar to that of smoking. However, little or no differences were found between those with upper secondary school and those with tertiary education (fig. 6). The pattern of differences was less clear for occasional snus use, but those with compulsory education seemed to have higher rates also for occasional snus use than the two other educational groups (not shown in the figure). The differences in figure 6 may be biased as the

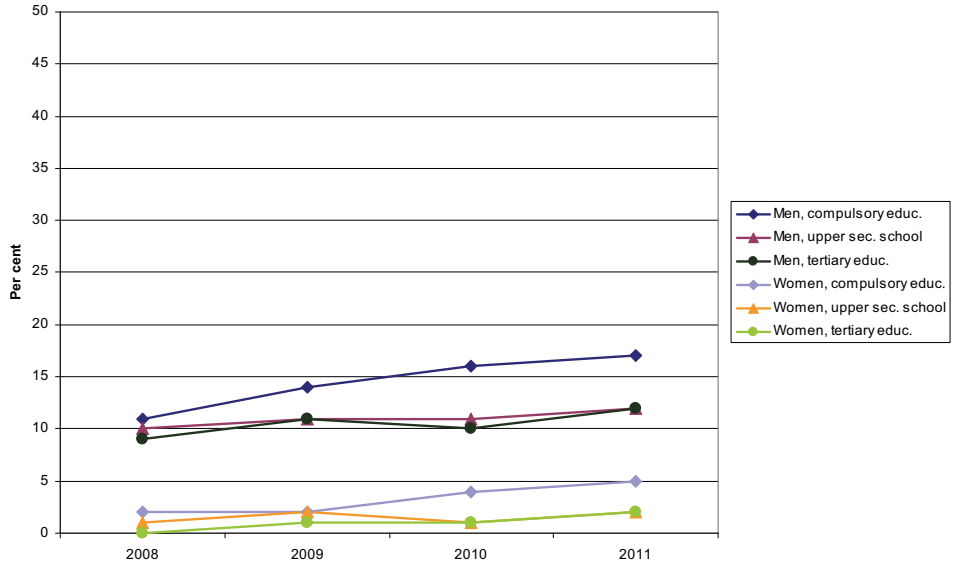
educational achievement will be unsure among the young below 25 years. The group "missing" is not shown in the fig. 6.

Figure 5. Daily and occasional smoking, by educational attainment 1998-2008. Both sexes, age 25+



Source: Norhealth and Statistics Norway, surveys of level of living

Figure 6. Daily snus use, by educational attainment 2008-2011. Men and women, age 16-74



Source: Statistics Norway

Socioeconomic factors are associated with motivations to quit smoking as well as with successful smoking cessation. A study among Hong Kong Chinese found higher education to be associated with quitting smoking.[30] Future health concern was more often reported in smokers with higher SES, whereas cost and current health problems were more often reported by lower SES smokers when they were asked what had triggered the last attempt to quit.[31] However, in a recent review including results from 8 studies in 10 western and non-western countries, educational level were not related consistently to quit attempts or quit success across countries. Only measures of dependence were found to be consistently predictive of smoking cessation.[32]

1.4 Snus as a facilitator for smoking?

Knowledge about factors contributing to changes in tobacco use is important for designing preventive strategies, including tobacco cessation programs for young people. The interval between initiation and dependence is known to be short and leaves a narrow window of opportunity for intervention for those who are vulnerable to or experimenting with smoking.[33]

In Norway young people often use both cigarettes and snus, or alternate between both types of tobacco. Snus use is steadily increasing among Norwegian adolescents.[34;35] Among university students a high proportion of previous smokers were found among daily and previous snus users, indicating that snus may contribute to smoking cessation.[36] In Sweden, snus use is regarded as important for smoking cessation.[37]

Some studies indicate that snus, and also other types of ST outside Scandinavia, is likely to produce a net health benefit through replacing smoking, while others find it unlikely that increased use of ST will give any substantial health benefits, when dual use of cigarettes and snus is taken into account.[38;39] A crucial question is whether ST could lead to smoking, especially among young people. Some studies among young adults and adolescents from the US and Sweden conclude that ST use alone is not a significant risk factor for the later use of cigarettes,[40-42] while other studies have reported that ST use increases the probability of taking up smoking in adolescent and young American men.[43-46] Conflicting results may be due to heterogeneity between populations, where attitudes to, and availability of, cigarettes and ST may influence the likelihood of transition between the tobacco types. Regulations of use, such as smoking bans in Norwegian restaurants and bars from 2004, may also affect the transition

between tobacco products. The question if snus use may increase the risk of taking up smoking is also referred to as the "gateway hypothesis".[41-43] Two recent reviews concluded that more knowledge is needed to determine whether ST use leads to smoking.[47;48]

2. Rationale and aims of the study

Our study is in line with the National Strategy for Tobacco Control 2006-2010[17], in particular regarding the strategic areas 1, 2 and 4, concerning tobacco prevention among young people, smoking cessation, and problems regarding the increasing consumption trends for ST.

An important task is to design feasible and cost-effective smoking cessation programs and knowledge on what motivates adults to quit smoking is important. Previous studies have reported several facilitating factors for quitting smoking: a short history of smoking, older age, non-smoking family members, high socioeconomic status, a smoking-related disease, and wanting to be a role model for children.[49-52] More knowledge about the association between background variables and specific reasons for quitting tobacco are of interest; "Which are the important reasons for whom?"

Most people start smoking in their youth and before the age of 20.[53;54] Several studies have investigated factors contributing to the uptake of smoking in adolescents. The presence of smoking models, particularly peer models,[55;56] rebelliousness and risk-taking,[57] low academic expectations,[58;59] easy access to tobacco[60] as well as tobacco marketing and exposure to smoking in films are found to be important factors.[61;62] Kulbok et al found that factors affecting adolescents' decisions not to smoke were concerns for health and addiction, a positive self-image, and perceived confidence.[33] To be able to prevent adolescents from starting to smoke it is essential to know the distribution of tobacco use among young people. Who are already using tobacco at the age of 16 years? Are there any systematic differences between daily smoking, occasional smoking and snus use by socio-economic and family background?

As snus is regarded as substantially less harmful than cigarettes, why should extensive use be a problem? There are several reasons. Even if snus use had no negative health effects, a high proportion of snus users create a high proportion of nicotine dependence in the population. Regarding smoking, the awareness of being addicted is referred to as an important motive for smoking cessation, but high levels of addiction is also a predictor for failing in smoking cessation.[32;63] These factors may also play a role in snus cessation. Another possible negative effect of snus use is that it may act as a facilitator for the uptake of smoking, either by switching from snus to cigarettes or by adding smoking to snus use. Patterns of transitions

may well be culture sensitive; hence findings reported from other countries may not be valid for Norway and vice versa. In the area of tobacco transitions, conflicting results call for more research, especially among young people.

The main aim of this project was to investigate factors that could be used when designing preventive strategies, including help with smoking cessation, individually or in population groups. Specific aims were:

- What are the main reasons for smoking cessation among adults? The first study assesses quitting reasons among male and female ex-smokers. Main predictors for the different quitting reasons are analysed, with focus on age, gender and socioeconomic factors.
- The second study sheds light on tobacco use at age 16 - in subgroups by gender, educational ambitions, family background factors, and urbanization. On the background of the known socio-economic differences in daily smoking, we assess socio-economic differences also in occasional smoking, snus use and the combination of snus use and smoking.
- In the third study we assess changes in tobacco use from age 16 to 19, influenced by known risk factors and protective factors. Specifically, we want to find out whether boys who were never-smokers, but snus users, at baseline had an elevated risk of smoking 3 years later, after adjustment for known risk factors for smoking.

3. Materials and methods

3.1 The health surveys and study populations

I was project leader for the Akershus Health Survey 1998, and headed the steering group for the youth surveys (including those used in this thesis) at NIPH in the period 2005-2009, where applications from researchers were considered.

Data from the Akershus Health Survey 1998, the Youth Study among 15-16 year olds 2000-2004 and the Youth 2004- study are used in this project.
Paper I: The data collection for the Akershus study was carried out by HELTEF (later part of Norwegian Knowledge Centre for the Health Services) and funded by the Akershus County Council.
Paper II: The Youth Study among 15-16 year olds in six counties was carried out and funded by the National Health Screening Service, later a part of NIPH, in collaboration with the University of Oslo and the Centre for Sami Health Research. The Municipality of Oslo contributed to the funding of the Oslo part of the study.
Paper III: The Youth 2004-study was carried out by NIPH and the University of Oslo. The City of Oslo (baseline) and RBUP (follow-up) in Oslo contributed to the funding of the study.

3.1.1 The Akershus Health Survey 1998 (Paper I)

In 1998, we conducted a postal population survey in Akershus County, Norway. Akershus had about 460,000 inhabitants in 1998. Random samples of the non-institutionalized population aged 16–80 were drawn from each of the 22 municipalities, stratified for age and sex. In all 79 subjects that had died or moved were excluded. A questionnaire was mailed to 11,919 subjects. Two reminders were mailed, the first as a combined thank-you card and reminder sent to everyone 2 weeks after the survey, and the second, including a new questionnaire, was sent to non-respondents after another 3 weeks. Statistics Norway did the sampling and dispatched the questionnaire. In total, 7,697 persons (65%) returned the questionnaire and 7,658 (64%) responded to an item about tobacco smoking habits.

In advance of the survey an information letter was sent to the parents of all sampled persons below the age of 18.

3.1.2 The Youth Study among 15-16 year olds (Papers II and III)

Cross-sectional surveys were performed during spring 2000-2004 among 10th grade pupils in 6 of 19 counties in Norway, including the capital Oslo, two southern inland counties (Hedmark and Oppland) and three northern counties (Nordland, Troms and Finnmark). All pupils in all 10th grade school classes were invited to participate. Nearly all public and private schools participated. A field worker was always to be present in the classroom, as well as usually one teacher, while the questionnaires were completed.

The informed consent form (Appendix 1) was signed by the student if he/she was 16 years of age by the day of the study and the parents/guardians were informed about the study. When these criteria were not met, the parents were contacted and asked to provide a separate informed consent form. The survey questionnaire was completed during school hours and supervised by trained field personnel.

Questionnaires were left at schools for students not present on the day of the study. Students who did not return the completed questionnaire during the course of the school year were contacted by letter sent to their home. They were encouraged to return the completed questionnaire and the informed consent form in two separate stamped envelopes that were enclosed.

All together 15931 pupils (87%) participated. 85% answered the questions about smoking and snus use. Of the pupils completing the questionnaires, 63% lived in cities, with Oslo alone making up 45% of the total study population. A part of the survey constituted the baseline survey for the Youth 2004-study (see 3.1.3).

3.1.3 The Youth 2004-study (Paper III)

Youth 2004 is a 3-year follow-up study using parts of the youth surveys – i.e. the survey 2000/2001 in both counties Oslo and Hedmark (UNGHUBRO and the Hedmark part of UNGOPPHED) as baseline (T1).[64]

Questionnaire data from 5750 10th graders from Oslo (n=3811) and Hedmark (n=1939) county were collected in school hours 2000-2001, with a response rate of 89% (T1). The 3-year follow-up study (T2) was partially carried out at school and partially as a postal survey. In the 2004 school survey, all final year students (3rd grade, 18-19 years old) in all secondary

schools in Oslo were invited. The students from Oslo who did not attend the final year in secondary schools in Oslo, were invited to participate in a postal survey in 2004 (n=3549 from schools and postal). Also, the total cohort from Hedmark 2000/2001 was invited to a postal survey in 2004 (n=1684). The school implementation took place from the end of January to the beginning of April 2004. The postal survey in Oslo and Hedmark was carried out in March – May 2004.

All together 3317 adolescents, or 58% of those who were reached by invitation in 2004, have participated twice in the Youth 2004 cohort in both counties and have also filled in a questionnaire at both times and given consent that both surveys may be linked and used in research (fig 7 and Appendix 1). The study population in paper III was 1440 boys (participation rate 50%). The girls were not included because of very low rates of snus use at baseline.

School-based survey

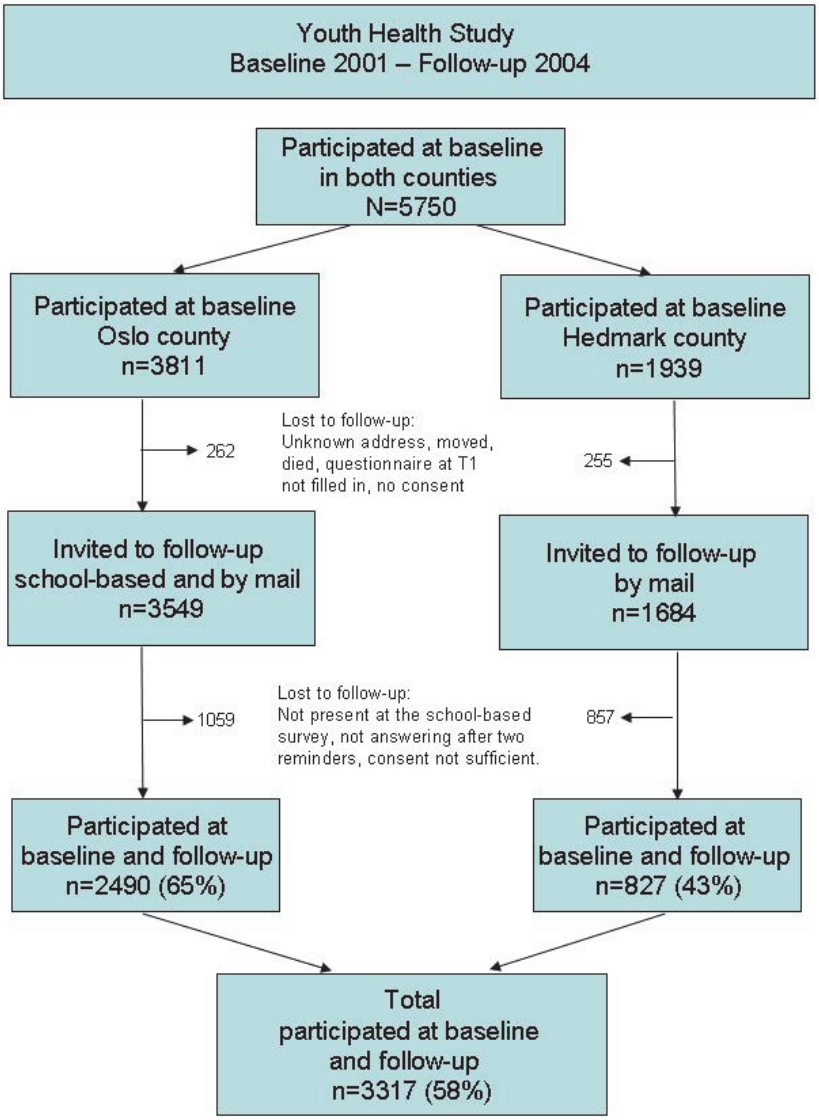
Implementation in the classroom was standardised. Two field workers carried out the survey in each class, with the exception of a couple of small classes. The contact teachers at the schools were asked to give students who were absent at the time of the survey the questionnaire in pre-addressed envelopes. The contact teachers were given a fee of NOK 1000 for the extra work this survey led to. In a few large schools the contact teachers were in addition given a gift voucher for NOK 500.

Postal survey

Invitation letters, brochure, questionnaire, consent form (at the back of the information letter), and a stamped return envelope were sent to all baseline participants in Oslo and Hedmark in 2000/2001, who had not declined further contact, and who were still living in Norway – and not approached through the Oslo school survey. The first reminder was mailed 4 weeks after the first mailing. After another 4 weeks, another reminder was mailed.

By filling in the questionnaire all participants were taking part in a prize draw of three prizes of NOK 15 000. All participants were also asked to give a buccal cell sample for genetic material. The genetic material was not used in our paper III. For further description of the procedures, see Sagatun et al [64]

Figure 7: Flow chart of the Youth 2004- study (both sexes)



3.2 The questionnaires and main variables

3.2.1 The Akershus health survey 1998, Paper I: a study on reasons for smoking cessation in adults.

The study was designed to carry out a population health profile among adults for the County Health Administration; the questionnaire "Survey about life and health in Akershus" is found as Appendix 2. The Short Form-36 (SF-36) for assessing health related quality of life[65] was included together with questions on physical activity, nutrition, use of alcohol and smoking issues. Some questions on work satisfaction, social contacts and use of health services were included as well. Information from registers was obtained through record linkage to Statistics Norway.

Previous daily smokers reported the three most important quitting reasons from the list that follows below:

1. Concern for own health
2. Because of own disease
3. Advice from the physician
4. Improving physical fitness
5. Disliking addiction
6. Disliking the smell of smoke
7. Because of own pregnancy
8. Out of consideration for own children
9. Out of consideration for other family members
10. Spouse/partner stopped smoking
11. A good friend stopped smoking
12. Financial reasons
13. Keep a nice-looking skin
14. Other reasons

The list of questions was designed with the help and advice of Frode Gallefoss and Else-Karin Kogstad, who were local experts in the field of tobacco cessation.

Reasons for smoking cessation were recorded and used as dependent variables in our study.

Exposure variables were physical and mental component summary scale (PCS, MCS) of the SF-36, time since quitting smoking, marital status, employment status, frequency of physical activity, and use of butter/margarine spread on bread (proxy for diet). The variables age, sex, highest attained education, and personal annual income after taxes were obtained from registers.

3.2.2 The youth studies 2000-2004, Paper II: a study of social differences in tobacco use in adolescents

The main questionnaire of the school based youth studies was the same in all six counties, see Appendix 3. Questions about physical and mental health, health problems, symptoms, strengths and difficulties (SDQ [66]), bullying, friends, family, use of medicines and different aspects of lifestyle etc. were included in the questionnaire.

Smoking and use of snus as main outcome variables were measured by questions that separated never, former, occasional and daily users. The question was: "Do you smoke, or have you ever been a smoker?" (tick one box only). The response categories were 1) no, never 2) yes, but I have quit 3) yes, occasionally and 4) yes, every day. The question about snus was worded "Do you use, or have you ever been using snus, chewing-tobacco or similar products?" with the same response categories as for smoking. In the analysis, both questions on tobacco use were categorized into daily, occasional or no use, with former tobacco users assigned to the no use category.

Exposure variables were sex, age, parents' marital status, parents' country of birth. Further, own reports of socioeconomic status were used. Educational plans were assessed with the question "What is the highest education you intend to take?" with seven answer categories, collapsed into five. In Norway, all pupils are at the same educational level by the age of 15-16 years, as the 10th grade is the last year of compulsory school. The pupils' own consideration of their family economy was assessed. An urbanization variable was constructed by dividing municipalities into 1) cities (according to administrative definition) or 2) rural areas (non-city municipalities).

The national population register was used for information about age, sex, and codes for municipality and districts in Oslo. All other variables are self-reported by the survey questionnaire.

3.2.3 Youth 2004, Paper III: a study of patterns of snus and cigarette use among boys

The questionnaires of this study were the same as in 3.2.2, Appendix 3 at baseline (T1) and much the same questionnaire, but with some alterations, at follow-up (T2). See Appendix 4.

Smoking and use of snus were both exposure and outcome variables in this study. The questions about tobacco use were the same as in paper II. Four mutually exclusive groups were categorized into: Daily or occasional snus use, but no smoking; Daily or occasional smoking, but no snus use; Dual use of snus and cigarettes; No current tobacco use.

Possible confounding variables (from the baseline survey) were much the same as in paper II, including adolescents' own reports of parents' marital status, parents' country of birth, own education ambitions, family economy and county (Oslo as an urban county and Hedmark as a predominantly rural county). Life style factors were previous smoking, previous snus use, alcohol use, sexual experience and household smoking. Information on the parents' income and education in 2001 were obtained from Statistics Norway and linked to the baseline survey data.

3.3 Statistical analyses

At first, all data was analysed using sex-specific cross-tables with p-values and confidence intervals for differences between categories.

Multivariate logistic regression was applied (SPSS) to obtain odds ratios (ORs) for the predictors of reasons to quit smoking in paper I. The survey constituting the data for paper I was carried out in 22 different municipalities, sampling 500 persons in all but the two municipalities with the largest populations, where 1000 persons were sampled from each. Because the population size ranged 2.600 to 100.000, this method led to an oversampling of small municipalities. The ex-smokers were asked to report the three most important quitting reasons from a predefined list of 13 reasons, but each subject reported from 1 to 10 reasons. To adjust for this and give equal weight to each respondent, we randomly sampled one response from each subject. The results were presented as cross-tables, weighted by municipality population to be representative of the county, and using Bonferroni correction of

p-values. In the multivariate analyses of predictors for each of the seven most common reasons for quitting smoking, we used all reported reasons, regardless of the number reported by each respondent, and here we did not use weights for county representativeness.

In paper II linear binomial regression to obtain risk differences (RDs) for tobacco use (glm in STATA) was applied, where a constant term measured the expected prevalence of the risk of tobacco use when all covariates were at their reference categories. In addition, main results were presented as relative effects (ORs) by the use of logistic regression (logistic in STATA).

In paper III we used multinomial logistic regression to obtain the effect size relative risk ratios (RRRs) for tobacco use, which are interpreted as ORs (mlogit in STATA). The model was a modification of a binary logistic regression model, with a nominal outcome variable with four levels.

Variables

Based on well documented association between socio-demographic factors and tobacco use the following variables were included in the preliminary regression models in all three papers: age, sex (only boys in paper III), marital status (paper I), parents' marital status (paper II and III), income from register (paper I and III), perceived family economy (paper II and III), education from register (paper I and III), educational ambitions (paper II and III). Country of birth was not thought to be an important factor in the county of Akershus in 1998 (paper I), but was included in all analyses in paper II and in all preliminary analyses in paper III with the self-reported variable "parents' country of birth". Employment status (self-reported) was included in the analyses in paper I. An urban/ rural variable was included in all analyses in paper II and a county variable (Oslo/ Hedmark) in preliminary analyses in paper III.

Other exposure variables in paper I were time since quitting smoking, physical and mental health component summary scales from SF36, and indicators of physical training and fat intake. Additional possible confounding variables in paper III were previous smoking, previous snus use, family members smoking, as well as indicators on alcohol use and sexual debut.

Regression models

In paper I we analysed with forward stepwise multivariate logistic regression (likelihood ratio). We finally examined the models and added or deleted variables, while examining the changes in the coefficients before the final model was fixed. In paper II all socio-demographic variables mentioned were used and kept in the final models regardless of significance or contribution to the total predictive value of the model. In paper III we started with preliminary models including all variables associated with tobacco use both at baseline and follow-up as possible confounders. Variables not influencing the association between tobacco use at baseline and at follow-up were left out in the final analyses, only keeping the confounding variables in the final models.

Interaction terms

In paper II interaction terms between parents' country of birth and sex were included in all the models. In paper III a multiplicative interaction term "smoking by snus use" at baseline was included in the preliminary analyses. To get interpretable ORs we used dummy variables for baseline tobacco use in all final models instead of keeping the interaction term.

3.4 Ethical considerations and approvals

In paper I, we did optical scanning and analyses at HELTEF (later part of Norwegian Knowledge Centre for the Health Services). Statistics Norway did the sampling and the record linkage, and all personal identifiable data were deleted after register linkage. Application for informed consent was not required, as the survey was performed by Statistics Norway in accordance with the relevant regulations.

In paper II, informed consent was collected from the parents of all pupils younger than 15 years of age, by the National Health Screening Surveys (later part of NIPH). Those who were 15 years or above could sign the informed consent themselves, according to the current permissions in year 2000. All parents were informed about the surveys among the 10th graders (mostly 15-16 years old) and they had the opportunity to refuse participation for their children. Anonymous data files were made available for research purposes.

In paper III, personal identity numbers from the baseline survey (part of the survey from paper II) were used to invite the participants to the follow-up survey by the NIPH. Only those

who had agreed to be contacted again were invited, and only those who at follow-up had agreed to link the two surveys for research purposes were included in the cohort study Youth 2004.

Record linkage to register data on parents' education and income was performed in Statistics Norway by the use of personal identity numbers and was sent back to NIPH (if participants had not refused such linkage). Anonymous data files were made available for research purposes. The procedures were approved by the Norwegian Data Inspectorate (concessions from 23.01.2004 and 12.04.2007) and a statement was obtained from the Regional Committee for Medical Research Ethics (letters from 09.01.04 and 02.10.07). The school based baseline survey and the part of the follow-up study carried out in the schools, received approvals from the school authorities in Oslo and Hedmark.

All data files used were anonymous and professional secrecy was required for researchers involved in the analyses. By the use and publishing of detailed results and the tabulation of small groups, the possibility of "backwards-identification" was taken into account. As an example from the youth studies, we did not tabulate country of birth and urban district within Oslo in any of the results, as that could result in very few pupils in some of the groups. Even by publishing larger groups we can not fully rule out the possibility of stigmatising groups of tobacco users. In the publishing of our results, we have strived for the use of broad and general categorisation. The proportion of tobacco users was relatively high in all groups, which contributed to diminishing the problem of stigmatising.

4. Results

4.1 Paper I: Association between age, gender and reasons for smoking cessation

The ex-smokers in our study were asked to pick out the three most important among 13 listed reasons to quit. Of the 80% who answered the question, 57% gave three reasons, 38% gave less than three reasons and 5% more than three reasons. Among men, the most frequently reported quitting reasons, in numeric order, were “concern for own health”, “wanting to improve physical fitness”, “disliking addiction”, and in equal fourth place came “because of own disease” and “out of consideration for own children”. Among women, the most frequently reported reasons were “concern for own health”, in equal second place “disliking addiction” and “out of consideration for own children”, “because of own pregnancy” and “because of own disease”.

Advice from the physician was not found to be a frequent reason for smoking cessation, 5% of the men and 2% of the women said this to be one of the three most important reasons for quitting. This reason was more often reported in older age.

An analysis of main predictors for the seven most important quitting reasons was performed. Wanting to improve physical fitness was important for younger men, who frequently had physical training. There was an increasing tendency to report disliking addiction with increasing age, good physical health and high income. Quitting out of consideration for their children was a more important reason for women, and was more often reported among those with higher income and education. Financial reasons were more often given by younger people. Own pregnancy was often given as reason among women with higher education. To quit smoking because of own disease was more important among older people with short education.

In sum, the young, healthy and well educated had stopped smoking to become healthier and less dependent, and to avoid harmful effects on their children, while the old, less healthy and less educated had stopped smoking because of health problems.

4.2 Paper II: Social differences in smoking and snuff use among Norwegian adolescents: a population based survey

Snus use was more common among boys (21.5%) than girls (3.5%) and smoking was more common among girls (33.8%) than boys (26.4%). These figures apply for daily and occasional tobacco use in sum. The rates of dual use among the boys was high, as nearly half of the boys using snus daily were also smokers and almost two thirds of occasional snus users were smokers.

Daily smoking was more common among adolescents planning vocational education, with single parents or poor family economy, expressed as risk difference (RD). The RD for daily smoking was +12.7% for vocational compared to academic study ambitions, +10.0% for adolescents with single compared to married/ cohabiting parents, and +5.8 among those with perceived poor compared to very good family economy. Occasional smoking and snus use (daily or occasionally) showed a similar, but less pronounced pattern regarding education and single parent families. Adolescents with parents from foreign countries were less likely to use tobacco. One exception was boys with parents from Muslim majority countries who had an increased risk of daily smoking. Norwegian boys were often dual users of both products, especially if they had divorced parents or ambitions to complete vocational studies or only one year of upper secondary school. Pupils living in rural areas had a small, but significantly decreased risk of smoking, but an increased risk of dual use, compared to those living in urban areas.

In sum, there was an inverse association of smoking and snus use with educational ambitions in both male and female adolescents, and also single parenthood and considered poor family economy were additional risk factors.

4.3 Paper III: Pattern of snus and cigarette use: a study of Norwegian boys followed from age 16 to 19

In the youth cohort of boys the total prevalence of tobacco use increased from 29% at baseline to 48% at follow-up, and the proportion of daily users increased as well. Among the baseline dual users 56% used at least one product daily, and this proportion increased to 68% at follow-up. Only a small proportion of the dual users reported daily use of both products, 8%

at baseline and 5% at follow-up. In the corresponding cohort of girls 30% were tobacco users at baseline (including < 1% snus users) and 41% at follow-up (including 7% snus users).

In two models we assessed the odds ratio (OR) of snus users, smokers, and dual users, compared to non-tobacco-users at baseline, of becoming smokers at follow-up. These models had different outcome variables of current tobacco use at follow-up: 1) Snus only use, smoking only, and dual use, regressed against no tobacco use, and 2) Smoking only and dual use, regressed against no smoking but possible use of snus. Hence, in the second model the reference group contained non-smokers and snus only users.

Figure 8. Model 1: Male snus use, smoking and dual use at follow-up (2004) according to baseline snus use. No tobacco as reference value at follow-up

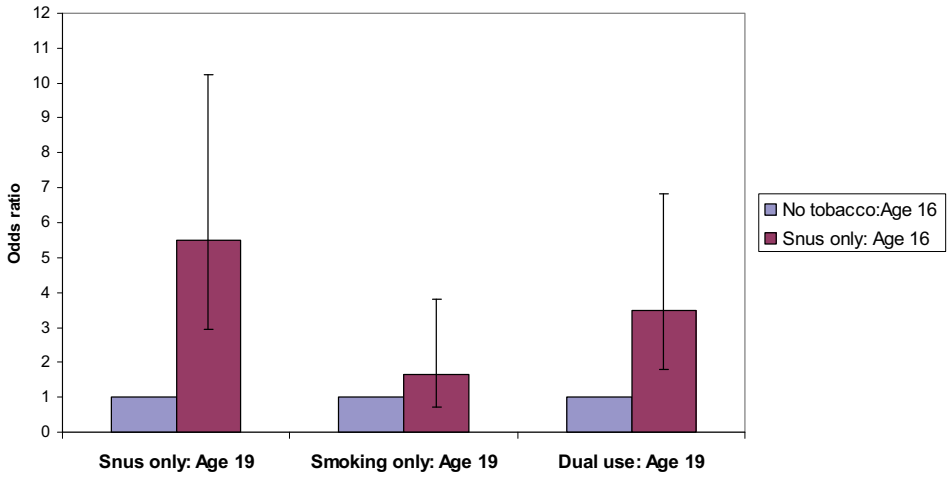
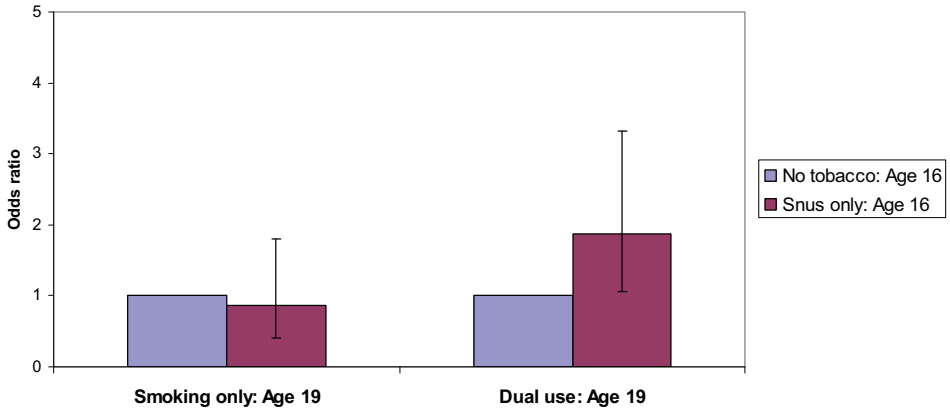


Figure 9. Model 2: Male smoking and dual use at follow-up (2004) according to baseline snus use. No smoking as reference value at follow-up



In both models, snus only use at baseline was *not* found to be significantly associated with increased odds of smoking only at follow-up. Model 1: OR 1.66, 95% CI 0.7-3.8. Model 2: OR 0.86, 95% CI 0.4-1.8. However, in both models snus only use at baseline was associated with increased odds of dual use at follow-up. Model 1: OR 3.49, 95% CI 1.8-6.8. Model 2: OR 1.88, 95% CI 1.1-3.3. In addition, model 1 assessed the OR for baseline snus only users to continue as snus only users at follow-up to 5.50, 95% CI 3.0-10.3. See figures 8-9.

Some other results from the two models above:
Baseline smokers had high odds of remaining smokers or becoming dual users at follow-up (model 1 and 2). The odds of switching from smoking only to snus only were not significant (model 1). Baseline dual users had high odds of still being dual users or to become smokers only at follow-up (model 1 and 2). The odds for baseline smokers of switching from smoking only to snus only were not significant (model 1).

We also performed multinomial models with separate variables for occasional and daily tobacco use at baseline and follow-up (not shown). These extended models confirmed the results from table 3 and 4. The main added information was that baseline daily or occasional snus only users who were dual users at follow-up only had increased odds of being daily snus users and occasional smokers, while baseline daily or occasional smokers had increased odds to be all kinds of dual users at follow-up.

In sum, there was an increased odds ratio for baseline snus only users to be dual users of snus daily and smoking occasionally at follow-up. There was no increased odds ratio for switching from snus only use to smoking only.

5. Discussion

We found that ex-smokers most commonly reported concern for own health, disliking addiction, and hoping to improve physical fitness as reasons for quitting smoking. There was an age gradient for all of the seven most frequently reported quitting reasons, and some reasons had marked sex differences. Several quitting reasons appealed more to the more prosperous and well educated, whereas quitting because of own disease was more common among the least educated. Quitting for the reason of physical fitness was more popular in males than females and showed no socioeconomic gradient.

Who are already tobacco users at the age of 15-16 years? We found high smoking rates in adolescents with vocational rather than academic ambitions, single parents, and poor self-reported family economy. Dual use of snus and cigarettes, applicable for 13% of the boys in our study, was associated with single parenthood and vocational study plans. Snus only use and occasional smoking had weaker associations with educational ambitions, family economy and single parenthood than daily smoking. Compared to adolescents with Norwegian parents, having parents from Muslim countries conferred an increased risk for boys and a decreased risk for girls for daily smoking.

Snus is considered to be harmless compared to smoking and among adults smoking cessation by starting to use snus instead of cigarettes has become relatively common.[67] However, transitions between the tobacco types may be different in young people not yet settled in their tobacco habits. By investigating transitions in adolescents' tobacco use between age 16 and 19, we found baseline snus only users to have increased odds for taking up smoking in addition to snus. We found no trend of switching from use of snus only to cigarettes only. By analysing occasional and daily use separately, we found that dual users at follow-up, originating from baseline snus only users, were most likely to use snus daily and to smoke occasionally.

5.1 Discussion of methods

The various reasons for quitting smoking represented dichotomous outcome variables in paper I. The use of logistic regression allowed us to assess the ORs of each possible socio-demographic predictor of the seven most frequently reported quitting reasons.

The advantage of using a linear model with RDs in paper II was to show the differences in absolute risks in percent, in contrast to relative risks or odds ratios, which are sometimes more difficult to interpret. However, as many researchers are not familiar with linear models and absolute effect measures, paper II also presented the main results as relative effects (ORs).

The multinomial logistic regression model in paper III enabled us to use both an exposure variable and an outcome variable with more than two levels (snus use, smoking and dual use). Hence, one single regression model was used to study transitions of different kinds of tobacco use between baseline and follow-up and the results were presented in one table. Alternatively, by the use of logistic regression, we could have performed three analyses, with three different outcomes; 1) "current snus use versus no tobacco", 2) "current smoking versus no tobacco" and 3) "current dual use versus no tobacco".

5.1.1 Strengths

A strength of all surveys was the large study population and the rather high response rates. The response rate was 65% in paper I. In paper II and in the baseline survey of the cohort from paper III the response rate was 87%, and 89% respectively, see also 3.1.1-3.1.3. In light of the current problems with recruitment to population surveys, and especially in postal surveys, the response rate from Akershus in 1998 was relatively high.[68-70] In school survey settings it is still possible to achieve high response rates, but there are problems associated with this method, such as tight time schedules in many school classes.

In the two first studies all information was collected at one point in time. In the first study (paper I) we used retrospective questions for the assessment of ex-smokers' reasons for quitting smoking. This allowed us to point out reasons and predictors of previous smoking cessation. The data collection in the youth surveys, including the school part of the follow-up survey, was standardized and carried out with trained field personnel. Even when the cross-sectional design in the study among adolescents (paper II) gave limitations to the interpretations of the associations, the character of some of the variables allowed us to make cautious interpretations of some SES-variables as predictors. The probability is relatively high that the establishment of the family economy and parents' divorce came before smoking initiation, as the pupils mean age was 15.9 years and the mean initiation age for daily smoking was 13.2 years. In the third study (paper III) the cohort design with three years between

baseline and follow-up gave us the unique possibility to study changes in tobacco behaviour between age 16 and 19, an important time period for smoking initiation.

Education- and income variables in the first and the last survey were obtained from registers and were not subject to information bias.

5.1.2 Information bias

First, the possibility of recall bias should be mentioned, as we asked about earlier tobacco behaviour in all surveys (paper I-III). Next, self-reports of tobacco may be subject to desirability bias.

Validated measures of tobacco use and dependence were not available in our surveys.[71] In the first study, respondents were not asked about previous smoking intensity, and the amount of tobacco used was not asked in the youth studies, which may both lead to misclassification.

The questions to ex-smokers about reasons for smoking cessation were not validated before the survey was carried out in Akershus in 1998 (paper I). However, we consulted several experts in the field of smoking cessation before concluding on 14 reasons for smoking cessation. An open answer category made it possible to give a reason not mentioned among the 14. The respondents were asked to give the three most important reasons to stop smoking.

As already mentioned, recall bias cannot be excluded, even when smoking cessation probably is a significant event in most ex-smokers' life, and therefore perhaps easier to remember than many other events. Among people who have started and stopped smoking more than once it may be difficult to remember which reasons dominated the decision to quit each time. The average time since quitting smoking was long, 14 years, in our study.

In the youth studies (paper II and III) the amount of tobacco was not asked, which may lead to misclassification. In New Zealand 30% of the adolescents turned out to be daily smokers, even when they reported to be occasional smokers.[72] Another study also found higher discrepancy among adolescents reporting non-daily use, concluded however that the overall quality of self-reported tobacco use among adolescents was reliable.[73] Both light and heavy users may be hidden behind the category "daily use" and even if we expect "occasional use"

to be interpreted as “non-daily use”, for some this may mean once a month, for others once a week or perhaps 4-5 times a week. Also nothing is known about the number of cigarettes or snus portions consumed at each occasion.

However, we are not sure if all problems would be resolved by asking adolescents detailed questions on the amount of smoking and snus use. This strategy may be too complicated in a survey setting and lead to response errors as well as lower response rates.

5.1.3 Selection bias

The response rate in the first study (paper I) was 65%. Among the participants women and the middle-aged (45-66 years) were overrepresented, and young adults 16-24 years underrepresented. Our respondents consisted of 3,132 (41%) never-smokers, 1,715 (22%) ex-smokers, and 2,811 (37%) current (daily or occasional) smokers. The ex-smokers were previously daily smokers. The ex-smokers were older, included fewer females, were more often married or cohabiting, and had longer education than current smokers (all differences with $p<=0.001$). In the analyses of reasons for smoking cessation and of the predictors for the different quitting reasons the data was either stratified for sex and age groups or the sociodemographic variables were controlled for by the inclusion in the multivariate analyses.

In the presentation of the reported quitting reasons among men and women, the oversampling in small municipalities in Akershus county was adjusted for by weighting. Also the over-representation of those reporting many reasons (range 1-10) was adjusted for by the random selection of one reason per respondent. When assessing the predictors for each of the seven most frequently reported quitting reasons in multivariate analyses, we used the total unweighted sample, and all reported reasons. This will lead to an over-representation of small municipalities and of those reporting many reasons. If the distribution of our predictors were systematically different in small and large municipalities, for instance with lower education in small municipalities, this may have led to an overrepresentation of ex-smokers with low education. Correspondingly, if our predictors systematically differed according to the number of reasons reported, for instance that young people reported more reasons than old, this may have led to an overrepresentation of young people. We cannot exclude this possibility.

The response rate was high in the youth surveys (87% in paper II), including the baseline survey of the cohort study (89% in paper III). The high response rate implies representative data on the 10th graders.

At follow-up in 2004 (paper III) 58% of the boys and girls participating at baseline were included in the cohort study. However, we included only boys in our study, and the participation rate among the boys was 50%. At baseline 71% of the boys were tobacco-free, but among those invited, but not attending 61% were tobacco-free. A higher percentage smoked and was dual users among those not attending. The prevalence of snus use was the same in both groups. A higher percentage of the participating boys had parents who were married or cohabiting, good or very good family economy, and were planning an academic study course, compared to those not participating in the follow-up. Adolescents with more successful life trajectories seemed to have been selected into the last part of the study. Thus, the participants in the follow-up study were not population-representative. How does this affect our results?

Bjertness et al did an analysis of non-response in the cohort study Youth 2004.[74] The follow-up study consisted of a school based part and a postal part. The response rate in the school based survey was higher than in the postal part of the 2004-survey. Of those invited in the schools in Oslo 85% participated and of those invited to a postal survey in Oslo only 35% participated. In sum, 65% of the baseline participants from Oslo participated again in 2004. The corresponding number from the entirely postal survey in Hedmark was 43%, in both counties together 58%. Bjertness et al found male gender, non-western ethnicity, postal survey compared with school-based, low educational plans, low education and income of father, low perceived family economy, unmarried parents, poor self-reported health, mental health problems and smoking to be significant predictors of being lost to follow-up. Lost to follow-up was found to have marginal impact on the estimated prevalence ratios. In our study (paper III) we consider the selection of boys with more successful life trajectories to have small or no effect on the results, as those most likely to smoke were underrepresented. If the transitions from snus use or tobacco free in 2001 to smoking in 2004 were influenced by this selection, it would probably be in the direction of fewer smokers rather than more smokers in 2004.

5.1.4 Confounding

When the observed association between an exposure and tobacco use is partly or totally due to another risk factor for tobacco use, the other risk factor confounds (blurs) the association studied and is called a confounder. Three necessary properties are attached to a confounder; it must be associated with the exposure, it must be independently (i.e. among the non-exposed) associated with tobacco use (as a cause or a proxy for a cause) and it must not be an effect of the exposure (i.e. not part of the causal pathway). Confounding is common in observational epidemiological studies and in relation to tobacco use, both age and sex (as proxies for a cause) are considered to be strong confounders. In the papers included in this thesis confounding is taken care of either by stratifying the analysis (by age and sex) or adjusting for confounders in multivariable analyses. In the follow-up study (paper III) we included boys only and the age span was narrow. As possible confounders, we adjusted for previous smoking and snus use, perceived family economy, and, as proxy for tendency towards risk-taking behaviour, alcohol use and sexual experience.

5.2 Discussion of main results

5.2.1 Reasons and predictors for smoking cessation

How do the results concerning motives for smoking cessation comply with other studies? As our first study was published in 2005, I found it necessary to search for more updated literature and perhaps new trends in the main reported reasons and predictors of smoking cessation.

I found studies about *reasons* for wanting to quit smoking, reasons for quit attempts as well as studies about reasons for smoking cessation. German industrial employees who intended to quit immediately or in the near future found health related risks to be the most important motive, next to pregnancy, concern for children and awareness of being addicted.[63] A Chinese study investigated "reasons for thinking about quitting smoking" in the last 6 months. The number one reason was concern for personal health, number two was concern about the effect of cigarette smoke on non-smokers, number three that "Chinese society disapproves of smoking", and number four the price of cigarettes.[75] Vangeli and West asked English smokers and ex-smokers the question; "What finally triggered your most recent quit attempt?" and found that concern about future health problems, current health problems, and the expenses of

smoking was most commonly reported.[31] In France, the main reasons for having made the last quit attempt were costs, social pressure, the wish to improve physical fitness and fear of a future smoking-related disease.[76] The most frequently cited reasons for quitting smoking in a study from USA and Canada (COMMIT study) were "concern for your own current or future health", "expense associated with smoking" and "concern for the effect of smoke on others".[77]

We did not ask if the alternative to use snus instead of smoking had been a reason for quitting in our study. But at the time of the first survey snus use would probably not have been an important quitting reason. We did not find snus use as a reason for quitting in the more recent literature cited above. The reason may be that snus is not sold in the European Union and has not been as widespread in other western countries as in Scandinavia.

The updated literature in this field is in line with the main results from our study and from earlier studies, although the importance of the different reasons for quitting or quit attempts differs from study to study.

A Reason for Quitting (RFQ) scale had been developed and validated at the time of our survey, first as a 36-item scale and then simplified as a 20-item scale with 2 intrinsic and 2 extrinsic dimensions.[78;79] We did not apply this scale, as the questions we wanted to include were partly different from those in the RFQ-scale. The RFQ-scale classed health concerns or the wish of self-control as intrinsically motivated reasons, while immediate reinforcement (for example saving money) and social influence were extrinsically motivated reasons.[78] Most of the later studies on reasons for quitting smoking did not apply the RFQ scale.

However, most studies also explored *predictors* of quit attempts or of smoking cessation. Different stages of readiness to quit smoking were described as precontemplation stage, contemplation stage and preparation stage, and higher levels of intrinsic relative to extrinsic motivation were associated with more advanced stages of readiness to quit smoking and successful smoking cessation at 12 months follow-up.[78] According to the mechanisms and motives of smoking cessation it has also been distinguished between the different transition stages "intention to quit", "quit attempts" and "successful quitting". Each stage has partly different determinants, as shown by Abdullah et al.[30] However, measures of nicotine dependence were found to be much more strongly associated with cessation than measures of motivation.[77] In a recent review from 10 countries (8 studies), past quit attempts and measures

of motivation to stop were found to be highly predictive of quit attempts. Only measures of dependence are consistently predictive of success of those quit attempts. Gender, age, marital status and educational level were not related consistently to quit attempts or quit success across countries.[32]

In our study we were exploring predictors for specific quitting reasons, not predictors of attempts to quit or of smoking cessation in general. Still, a measure of dependence in our study might have given new insight or other results regarding predictors of reasons for smoking cessation.

Our study of predictors for different quitting reasons among adults showed age differences. Young age predicted the financial reasons, own pregnancy and the wish to improve physical fitness. Other studies of quit attempts and giving up smoking among young people found important factors to be concern about future and current health, concerns about physical appearance, cost of cigarettes, athletic performance, non-smoking parents, fewer smoking friends and low levels of perceived stress.[80;81] A recent Norwegian study of predictors of smoking cessation reported that bringing social pressure to bear on the individuals by focusing on the opinion of "significant others" (friends/closely related persons) was more fruitful among adolescents than among adults.[82]

5.2.2 Advice from health professionals

Advice from the physician was not a common reason for smoking cessation in our study, but was more often reported in older age groups. This result seems to be in accordance with studies from other countries.[31;76;77] The reason for this lack of importance is unclear. Was it because the GPs did not ask about smoking habits or perhaps did not mention smoking cessation? Was it because of infrequent contact with the GP? Or was it because the advice from the GP had little impact? The cessation reason "because of own disease" was an important reason for quitting, especially in older age. Possibly, many in the group reporting own disease as a quitting reason, had received doctors' advice, even when they ticked off for own disease. The reason for quitting scale distinguished between intrinsic and extrinsic dimensions of quitting reasons and it was found that intrinsic reasons were more successful for smoking cessation than the extrinsic reasons, see above 5.2.1.[78] As advice from GP must be seen as an extrinsic reason, this may explain the low ratings of this quitting reason among

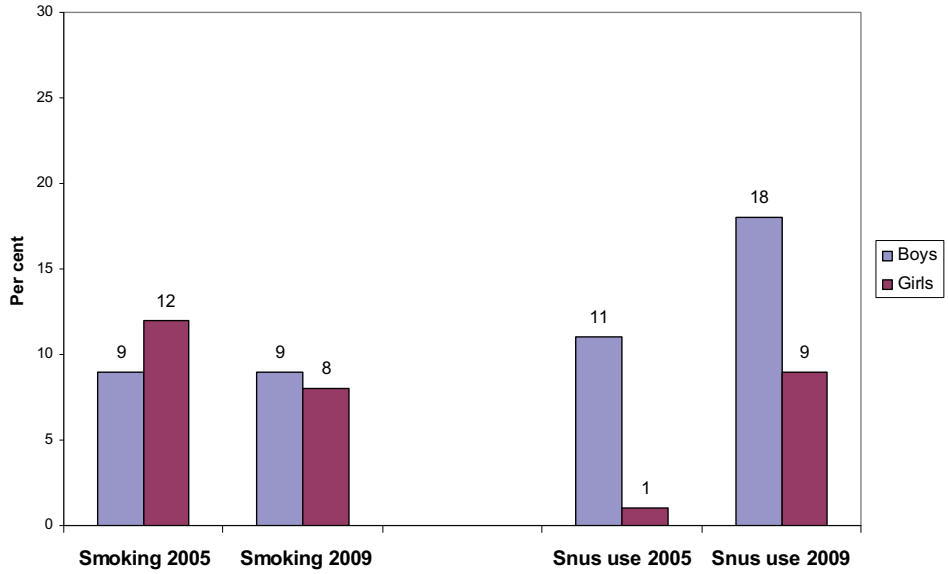
the ex-smokers. However, this does not mean that GP's advice was ineffective; it may have been one important factor on the way to smoking cessation.

This would be an important issue for later research, as health reasons are rated as very important among the ex-smokers. Could it be explored as a potential way of influencing the last segment of the "hard core smokers", who are probably very aware of the health risks by continuing smoking?[83] New medications may enhance the potentials of GPs to help people stop smoking or with snus cessation, particularly by helping those with high levels of nicotine dependence.[84;85] Relating to the results from paper II and III, health professionals, namely public health nurses in the schools, may have a not fully explored possibility to influence the students in a period of life where tobacco initiation is most likely.

5.2.3 Tobacco use in young age

The high prevalence of smoking among Norwegian adolescents at the beginning of the new century and in the Youth Studies 2000-2004 (paper II) has declined after that time. On the other side, the use of snus has increased and the total prevalence of tobacco use has rather increased than decreased (fig. 10). The total health risk from tobacco use among adolescents will probably decrease, as snus use is less harmful than smoking. However, the health risk will also be dependent on the proportion of dual users among the young tobacco users.

Figure 10. Daily and weekly smoking and snus use among 15 years old in 2005 and 2009



Source: Norgeshelsa, Health Behaviour among School Children (HBSC), WHO and HEMIL-senteret

In our study among 10th graders, more girls (34%) than boys (26%) were daily or occasional smokers, while more boys (21%) than girls (4%) were daily or occasional snus users (paper II). Perceived family economy and educational ambitions showed negative association with smoking. Other studies have also consistently reported higher risk of youth smoking in non-affluent or low SES families.[20;21]

In our study occasional smoking showed a similar pattern regarding SES as smoking, but less pronounced. We found a negative association with educational ambitions, and more occasional smoking was reported in single parent families. A weaker negative association with SES for occasional smoking than for daily smoking was also found in other youth studies. Koivusilta et al found the number of cigarettes smoked to be negatively associated with later educational level. Holmen et al found occasional smokers to be in higher academic courses than daily smokers.[86;87]

The SES-differences according to snus use in our study were not consistent. Snus use was less prevalent among adolescents with high educational ambitions and among those with married/ cohabiting parents. This SES-pattern was less pronounced than for smoking and not unlike

that for occasional smoking. On the other side, daily snus use was positively associated with perceived family economy among the boys in our study. The differences regarding educational orientation corresponded to findings from a Swedish study, whereas no association was found between socio-educational status and snus use in a Norwegian study with data from 2004 and 2007.[20;88]

We found adolescents with a Muslim cultural background to differ in their tobacco habits compared to adolescents with a Norwegian cultural background. Having parents from Muslim countries conferred an increased risk for boys and a decreased risk for girls for daily smoking. Adolescents with parents from Muslim countries had low rates of snus use. A high smoking prevalence among men and a low prevalence among women with Muslim identification are also found in other studies.[89;90]

5.2.4 Transitions of tobacco use between age 16 and 19

Our cohort study (paper III) showed high rates of tobacco onset in the age between 16 and 19, even in our selected survey where the baseline respondents smoked less than those not attending the follow-up. Among the boys, the prevalence of dual use of snus and smoking (daily and occasionally) increased from 10% to 19% between age 16 and 19. The total prevalence of tobacco use increased from 29% to 48% in the same cohort. Very few girls used snus at baseline (less than 1%) and as we wanted to study possible transitions from snus use to smoking, we included boys only. At follow up (age 19) 7% of the girls were snus users, and in future studies of tobacco use among adolescents it would probably be possible to include both sexes in the study. The total prevalence of tobacco use increased from 30% to 41% among the girls between baseline and follow-up. Hence, a higher percentage of boys (nearly one half of them) than girls were tobacco users at age 19. A comparison to other studies is difficult, as most studies report smoking and snus use separately (figure 10). In one study among 15-year old Norwegian boys the prevalence of daily tobacco use seemed to be comparable to the level among the 10th graders in our study.[34]

In our cohort study, baseline use of snus only among adolescents did not increase the odds of being smokers only at follow-up, after adjusting for previous smoking (lifetime smoking) and other risk factors. Studies from other countries show different results, and our results were in line with Galanti et al (Sweden) and Timberlake et al (USA), but not with Severson et al and Walsh et al.(both USA)[40;42;44;46] In a telephone-based Norwegian survey the same adolescents

were interviewed in 2006 and 2007, and changes in smoking cognitions between the two assessments were determined. Among "snus starters" changes were found that may contribute to facilitation of smoking initiation, even when the majority of the attitudes known to promote smoking initiation among adolescents seemed not to be influenced by snus use.[91]

However, our results showed that boys who were snus only users at age 16 had increased odds to be dual users at age 19, after adjusting for previous smoking and other risk factors. This result was confirmed in two different models, see also chapter 4.3. We have not found corresponding results from other studies, but two recent reviews concluded that more knowledge is needed to determine whether ST use leads to smoking.[47;48] The 19-year old dual users originating from snus only use at age 16 most often used snus as their main tobacco product (snus daily and cigarettes occasionally). Hence, this group may experience less serious health hazards, even if the likelihood of quitting tobacco will not necessarily be higher.

As baseline snus only users were found to have an increased risk of being dual users at follow-up, the possibility for dual users to become tobacco-free or snus only users in the future is of interest. We only have information about the baseline dual users, and their tobacco use at follow-up, and not about the future trajectory of the 19 year old dual users at follow-up. Those who were dual users at age 16 had high risk of still being dual users at age 19. They also had an increased odds ratio of being smokers only or snus only users at age 19. In other studies dual users were found to be a high risk group for tobacco dependence.[40;92]

The factors contributing to starting or stopping tobacco use also depend on the availability and prices of different tobacco products and on the restrictions of use in public places. The declining smoking rates as well as the increasing rates of snus use and dual use are probably affected by the ban of smoking in restaurants and bars introduced in Norway in 2004. We do not know the influence of cultural and socio-demographic changes in the Norwegian population. Will girls with parents from Muslim countries adopt the restrictive smoking behaviour of their mothers or rather the tobacco habits of their Norwegian counterparts? Will pupils in vocational education course adopt the tobacco habits from their school friends, even if their own parents don't smoke?

5.2.5 The surveying of tobacco use

The Nordic countries are in a late stage of the smoking epidemic, where lower smoking rates are accompanied by marked SES differences. We are now following the epidemic of snus, and we do not know yet if it will look similar to the smoking epidemic. The harmful effects of snus alone seem to be small, but with some uncertainty regarding population effects over a long time span. Taking this uncertainty into account, it is important to be able to follow the development of snus use and dual use in all population groups. This requires using good questions about both products, including questions about the volumes. Among youth the questions could be simpler, distinguishing daily use from non-daily use, in addition to questions about previous tobacco use.

The usual way of reporting tobacco use in surveys is to present percentages of daily and occasional use of cigarettes and corresponding figures for snus use. This implies limited information. In figure 2, for example, we do not know if the increasing trend of occasional smoking among young men is due to occasional smoking alone or if it is because of an increasing trend of dual use. To be able to follow the total use of tobacco in a population where smoking, snus use as well as dual use is relatively common, it is necessary to report the percentages of smoking only (but no snus use), snus only (but no smoking) and dual use (of both products) in addition to the conventional way of reporting on tobacco. This would make it possible to follow the total use of tobacco over time.

6. Conclusions and implications

The main reason for smoking cessation among adults was concern for own health. In addition, a high proportion of both men and women reported disliking addiction as a reason to have quit smoking. Smoking cessation to improve physical fitness was frequently reported among men, whereas women more often reported consideration for their children. Our results among previous smokers indicate marked age and gender differences concerning reasons for quitting smoking. Future research may use the different preferences and reasons for quitting, focusing on the psychological aspects of the motives for smoking cessation. More knowledge about the role of medical doctors and other health personal in advising the smokers to quit is needed, in addition to the possible influence on tobacco prevention in young age.

High smoking rates were found among adolescents with single parents, poor self-reported family economy and vocational educational ambitions. Dual users of both cigarettes and snus had increased risk of living in single parent families and had often vocational rather than academic ambitions. Snus only use and occasional smoking had weaker associations with socioeconomic factors than daily smoking. Public health initiatives to avoid or reduce tobacco use should be aimed at reaching all adolescents in all kind of schools. However, there are special challenges associated with tobacco prevention and cessation in vocational study course and among those leaving school early. More knowledge is needed in the field of preventing tobacco use in adolescents with high risk profiles.

We found that snus only use in early adolescence was associated with the increased risk of taking up smoking in addition to snus during adolescence. Those using snus only at age 16 had an increased risk of being dual users of daily snus and occasional smoking at age 19. Snus only use at age 16 was not associated with the risk of becoming smokers only at age 19. The risk for dual users at age 16 of remaining dual users or smokers at age 19 was high. Even if snus use is less harmful than smoking, we have to be aware of the possible transitions from snus use to smoking among young people. Our results indicate an increasing proportion of both snus users and dual users among young adults, and highlight the need for preventive efforts and professional interventions for users of both products.

Appendices

Appendix 1: Forms for giving informed consent in the youth surveys (in Norwegian)

Appendix 2: The questionnaire “Survey about life and health in Akershus county”1998 (in Norwegian)

Appendix 3: The questionnaire of the Youth Studies in six counties 2000-2004, exemplified by the Oslo Health Survey (UNGHUBRO)

Appendix 4: The questionnaire to the follow-up study “Youth 2004 in Oslo and Hedmark” (in Norwegian)

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Errata:

Øverst på side 4, i **Summary**, første setning under **Background** står det:
The smoking prevalence in Norway has been declining since the 1970s among men and since the 1990s among women.

Dette rettes til:
The smoking prevalence in Norway has been declining since the 1960s among men and since the 1990s among women.

På side 11, første setning i kap. **1.2 The tobacco epidemiology in Norway** står det:
Smoking began to decrease among Norwegian men in the beginning of the 80ies, and among women not before the end of the 90ies.

Dette rettes til:
Smoking began to decrease among Norwegian men in the beginning of the 1960s, and among women not before the end of the 1990s.

PAPER I

Association between age, gender and reasons for smoking cessation

Published in Scandinavian Journal of Public Health, 2005; 33:72-76.

PAPER II

Social differences in smoking and snuff use among Norwegian adolescents: A population based survey

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Social differences in smoking and snuff use among Norwegian adolescents: A population based survey

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Abstract

Background: A change in pattern of tobacco use has been observed in the last decade in Norway. Snuff use and occasional smoking have to some degree replaced daily smoking among adolescents and young adults. Daily smoking is known to be negatively associated with social background factors, but little is known about these associations for other types of tobacco use. Our aim was to study different types of tobacco use among adolescents according to gender, educational ambitions, family background factors, and urbanization.

Methods: Cross-sectional, school-based study with 15 931 participants and response-rate 87%, conducted among 15 and 16 year olds during 2000–2004.

Results: More girls (33.8%) than boys (26.4%) were daily or occasional smokers, while more boys (21.4%) than girls (3.5%) were daily or occasional snuff users. Daily smoking was more common among adolescents planning vocational education, with single parents or poor family economy. Occasional smoking and snuff use (daily or occasionally) showed a similar, but less pronounced pattern regarding education and single parent families. Adolescents with parents from foreign countries were less likely to use tobacco. One exception was boys with parents from Muslim majority countries who had an increased risk of daily smoking. A typical combination user of both tobacco types was a Norwegian boy with divorced parents and ambitions to complete vocational studies or only one year of upper secondary school.

Conclusion: Tobacco use in adolescents is mainly associated with low educational ambitions and less affluent self-reported family economy. Adolescents with divorced parents use more tobacco than those living with both parents. Public health initiatives to avoid or reduce tobacco use should mainly target adolescents in vocational studies and those leaving school early.

Background

During the past ten years, the sale of oral moist snuff has increased in Norway, while the sale of tobacco for smoking has decreased. Snuff use and occasional smoking have to some degree replaced daily smoking among adolescents and young adults. The snuff marketed in Norway and Sweden (snus) is a non-fermented, moist and smokeless tobacco product [1,2]. The sale of snuff is illegal in the European Union (EU), except in Sweden where the legal use is claimed to reduce the smoking rates [3-5]. Smoke-

less tobacco is used on a relatively wide scale in Norway, a country which is not a member of the EU.

The ban on cigarette smoking in restaurants and bars, which was introduced in Norway in June 2004, may have influenced changes in choice of tobacco type. A Norwegian national survey among pupils in lower secondary school (13–16 years) showed the prevalence of daily smoking to be 5% in 2005, which was half the rate found in the survey five years earlier. Occasional smoking decreased from 18 to 9% in the same period. Snuff use among boys did not change, showing 4% daily and 12% occasional users in 2005. An increase in occasional snuff use from 2% to 5% from 2000 to 2005 was found among the girls [6].

The use of snuff is considered to be less harmful than cigarette smoking, but the evidence of health risks is by no means consistent [7-10]. Two recent reviews on possible health effects of snuff produced conflicting results; one concluded that there is limited epidemiological evidence about the health effects, whereas the other indicated increased risk of myocardial infarct and cancer, assessing experimental evidence from animal studies in addition to research in humans. Both reports concluded, however, that snuff use causes nicotine dependence [11,12]. Combined use of snuff and cigarettes among male adolescents has been associated with higher levels of nicotine dependence than cigarettes alone [13]. Most users of snuff combine it with smoking cigarettes [14]. The International Agency for Research on Cancer stated in 1985 that there was a carcinogenetic effect of snuff, which was confirmed in 2005 [15,16].

In Western countries, daily smoking is known to be negatively associated with socio-economic status (SES) [17-22]. The association of snuff with SES is less clear. A Swedish study pointed out an increase in snuff use among well educated urban young people [12]. A similar trend has been shown for occasional smoking [23-26]. In a Swedish city, snuff use was more common among 18 years old pupils attending vocational schools than academic schools and among boys whose parents had no more than compulsory education [27]. In Sweden, regional differences have been found for snuff use, with the highest prevalence in northern rural areas [28]. In the 1980's, prevalence of snuff use was 10% daily and 23% occasional among Norwegian army conscripts, also among athletes and highly educated people [29]. Compared with smoking, the use of snuff seems to differ less by SES and more by region [11,17].

The aim of this study is to describe the use of tobacco in 15–16 year old pupils by gender, educational ambitions, family background factors, and urbanization. In particular, this study aims to improve knowledge of socio-economic differences in snuff use and combination use of snuff and smoking. Considering that Nordic countries are in the late stages of the smoking epidemic, we expected to find marked SES differences in the prevalence of daily smoking in our study [18,20]. Little is known, however, about the extent of SES differences in adolescents' occasional smoking and snuff use, which may both represent tobacco use epidemics that differ from daily smoking. Based on existing literature in older age groups, we would expect less SES difference for occasional smoking and snuff use than for daily smoking, or even a positive association between SES and occasional smoking.

Methods

Design and participants

Cross-sectional surveys were performed during 2000–2004 among 10th grade pupils in 6 out of 19 counties in Norway, including the capital Oslo, two southern inland counties and three northern counties. Nearly all public and private schools participated. The survey questionnaire was completed during school hours, and standardized explanations on how to complete it were given by trained field personnel. Altogether 15931 pupils (87%) participated. Among pupils completing the questionnaires, 63% lived in cities, with Oslo making up 45% of the study population. The study protocol was approved by the Norwegian Data Inspectorate and by the Regional Committee for Medical Research Ethics.

Measures

Smoking and use of snuff was measured by questions that separated never, former, occasional and daily users. The question was: "Are you smoking, or have you ever been smoking?" (tick one box only). The response categories were 1) no, never 2) yes, but I have quit 3) yes, occasionally and 4) yes, every day. The question about snuff was worded "Are you using, or have you ever been using snuff, chewing-tobacco or similar products?" with the same response categories as for smoking. In the analysis, both questions on tobacco use were categorized into daily, occasional or no use, with former tobacco users assigned to the no use category. The age for starting smoking was asked (average 13.2 years). No corresponding question was asked for snuff use.

Age was estimated using month and year of birth and date of survey participation. Average age was 15.9 years (range 14.5–18.4 years) and was categorized into quartiles in the analysis.

The parents' marital status was categorized as 1) married/cohabiting 2) unmarried 3) divorced/separated 4) wid-

owed 5) other. The first category was kept as recorded. Remaining categories were combined as "divorced, separated etc" in the analysis.

Parents' country of birth was reported and for the purpose of this study grouped according to Muslim cultural influence. We used three categories: 1) Norwegian parents: at least one parent born in Norway 2) Parents from a Muslim country: both parents born in a country with a Muslim majority population and 3) Parents from other foreign countries: both parents born in other foreign countries or one parent born in a Muslim majority country and one in another foreign country. When information was given for only one of the parents (0.9% of the sample), this information decided to which group the pupil belonged. Muslim cultural background was singled out in the analysis because it is a factor known to affect the use of tobacco, with higher smoking prevalence among men and lower smoking prevalence among women. Muslim religious beliefs have been associated with low smoking prevalence [30,31].

Educational plans were assessed with the question "What is the highest education you are intending to take?" Seven answer categories were collapsed into five: 1) academic studies at higher or medium level: more than (master) or less than (bachelor) four years of college/university 2) upper secondary school, general studies 3) upper secondary school, vocational studies 4) one year at upper secondary school/other plans 5) undecided. In Norway, all pupils are at the same educational level by the age of 15–16 years, as the 10th grade is the last year of compulsory school. After this grade they decide to attend upper secondary school or not. Upper secondary school, general studies, is a pre-requisite for academic studies.

The pupils' consideration of their family economy was assessed by asking if their family, compared to other families in Norway, were probably "very well off," "well off," "in the middle" or "short of money." An urbanization variable was constructed by dividing municipalities into 1) cities (according to administrative definition) or 2) rural areas (non-city municipalities). Partial non-response to questions used in the analyses was generally low (0.5 – 2.3%).

Statistical analysis

We collapsed the six combinations of daily or occasional use of smoke and/or snuff into five groups as shown in figure 1. We did four regression analyses using in turn one of the groups I–IV shown in figure 1 as the outcome variable (coded 1) and regressed it against non-users of tobacco (group V, coded 0), with gender and socio-demographic variables as covariates.

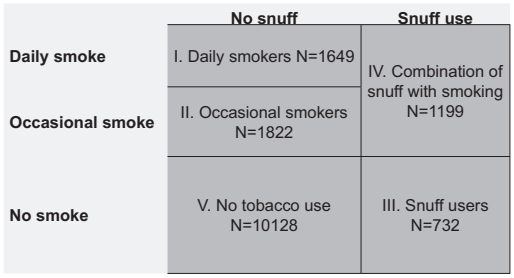

Figure 1
Number of tobacco users and non-users among 15–16 year olds 2000–2004.

The risk differences for tobacco use were estimated using linear binomial regression. This is a generalized linear model with binomial distribution family and identity link function [32]. In STATA this model can be fitted with the command:

glm y x1 x2 x3, family(binomial) link(identity).

We used the alternative linear regression with a robust variance estimator

regress y x1 x2 x3, robust

The regression coefficient from this model measures the risk difference for tobacco use. As for other linear models, appropriate covariate coding enables the constant term to measure the expected prevalence or risk of tobacco use when all covariates are at their reference categories. The advantage of using risk difference is that differences in absolute risks are shown, in contrast to relative risks or odds ratios. Interaction terms between parents' country of birth and gender were included in all the models.

We also calculated odds ratios (ORs) with 95% confidence intervals (CIs) by using logistic regression and the same models and outcome variables as for the binomial regression.

Data were analysed using STATA, version 9.2 and SPSS, version 14.0.

Results

Snuff use, daily or occasional, was more common among boys (21.5%) than girls (3.5%) (table 1). This makes snuff use almost as common as smoking for boys. Smoking, daily or occasional, was more common among girls (33.8%) than boys (26.4%). Nearly half of the boys using snuff daily were also smokers, and almost two thirds of

Table 1: Prevalence of tobacco use among 15–16 year olds.

Boys				
	Daily snuff (%)	**Occas. snuff (%)**	**No snuff (%)**	**Smoke, all (%)**
Daily smoke (%)	1.0	6.4	6.4	13.8
Occasional smoke (%)	1.8	3.5	7.3	12.6
No smoke (%)	3.0	5.8	64.9	73.7
Snuff use, all (%)	5.8	15.7	78.6	100.1
Girls				
	Daily snuff (%)	**Occas. snuff (%)**	**No snuff (%)**	**Smoke, all (%)**
Daily smoke (%)	0.0	1.9	14.8	16.7
Occasional smoke (%)	0.1	0.8	16.2	17.1
No smoke (%)	0.0	0.7	65.5	66.2
Snuff use, all (%)	0.1	3.4	96.5	100.0

Per cent 2000–2004

occasional snuff users were smokers. About two thirds of boys and girls did not use tobacco in any form.

The percentage of daily smokers increased with age for boys, but not for girls (table 2). Boys and girls with single parents had higher smoking prevalence. Daily smoking was strongly associated with educational plans, with the lowest smoking prevalence in the university/college group and among those not yet decided. For both boys and girls, prevalence of daily smoking was highest among those who rated their family economy the lowest.

Snuff use did not vary with age (table 3). Boys and girls with single parents had a higher prevalence of snuff use. Snuff use was rare among adolescents with parents from countries with majority of Muslims. Snuff was negatively associated with educational plans in the same way as smoking and more common in rural than in urban areas.

The results from binominal regression models of daily smoking, occasional smoking, and snuff use (daily or occasional) are shown in figure 2 and table 4. The interaction term of gender with parents' country of birth being a country with majority of Muslims was statistically significant, and this interaction term was included in all the models.

The first line in table 4 shows the constant terms from the model, which is the expected prevalence of tobacco use when all covariates are at their reference values. In other words, a boy in the youngest age quartile, with parents from Norway and living together in an urban area, with academic educational plans and considering his family economy to be very good. The other lines show the risk differences, which are to be added to the constant term when the covariates are not at their reference values. The constant and all model coefficients are multiplied by 100 to increase readability. To calculate the expected prevalence of daily smoking for any covariate pattern, simply add the risk differences in table 4.

Example: Boys in the upper quartile of age, with parents living together and born in a country with majority of Muslims, vocational study plans, the family considered short of money, and living in a rural area, have an expected prevalence of daily smoking of 1.3 (constant) + 2.5 (effect of age) + 0 (effect of parents marital status) + 3.8 (effect of Muslim influence for boys) + 12.7 (effect of voc. study plans) + 5.8 (effect of economy) – 1.7 (effect of rural area) = 24.5%.

Daily smoking

The expected rate of daily smoking was 1.3% for a reference individual (table 4, column I and figure 2). The effect of gender depended on parents' background. Girls with parents born in Norway were 11.9% more likely to smoke than their male counterparts. Girls with parents from Muslim majority countries were 4.5% less likely to smoke than Norwegian boys in the reference category, although this was not significant. Pupils with single parents had a 10% higher risk of daily smoking compared to pupils with parents living together. Pupils planning vocational education had a 12.7% higher risk for daily smoking than those planning an academic education. The factors "single parents" and "vocational education" discriminated clearly between daily smoking and other tobacco use (figure 2).

Table 2: Smoking among 15–16 year olds in socio-demographic groups.

	Boys					Girls				
	N	Daily (%)	Occasionally (%)	No smoke (%)	*P**	N	Daily (%)	Occasionally (%)	No smoke (%)	P*
All participants	7762	13.8	12.6	73.6		7768	16.8	17.0	66.2	
Age, years										
14.5–15.6	1888	11.8	12.5	75.7	<0.037	1991	16.3	18.4	65.2	<0.579
15.6–15.9	1901	13.4	12.2	74.5		1974	17.2	16.5	66.3	
15.9–16.1	1956	14.3	13.1	72.6		1915	16.4	16.3	67.3	
16.1–18.4	1988	15.5	12.7	71.8		1872	17.2	16.8	66.1	
Parents' marital status										
Married/cohabiting	5135	10.7	12.4	76.9	<0.000	5152	12.2	16.4	71.4	<0.000
Divorced, separated, etc	2555	19.8	13.1	67.2		2587	25.7	18.4	55.9	
Parents' country of birth										
Norway	6737	13.9	12.7	73.5	<0.210	6786	17.9	17.8	64.3	<0.000
Country with majority of Muslims	583	13.6	10.1	76.3		550	6.4	8.4	85.3	
Other foreign countries	330	10.9	13.6	75.5		380	11.8	14.7	73.4	
Educational plans										
Academic studies	3320	8.3	12.7	79.0	<0.000	3942	11.5	18.0	70.8	<0.000
Upper secondary school, general studies	436	10.8	12.6	76.6		390	19.7	17.5	62.3	
Upper secondary school, vocat. studies	2420	21.7	13.0	65.3		1700	29.5	15.5	54.9	
One year of upp sec school/other plans	408	20.3	13.2	66.4		303	22.1	21.8	56.1	
Undecided	1053	10.3	11.2	78.5		1355	13.7	15.9	70.5	
Family economy										
Very well off	879	13.1	12.7	74.2	<0.000	603	18.6	18.1	63.4	<0.000
Well off	4186	12.2	12.3	75.5		4042	14.1	16.6	69.3	
In between	2347	15.9	12.9	71.2		2736	19.0	17.3	63.7	
Short of money	232	22.0	16.4	61.6		281	28.8	19.9	51.3	
Urban – rural areas										
Urban areas	4870	13.0	12.6	74.5	<0.035	4911	16.4	17.5	66.2	<0.244
Rural areas	2892	15.0	12.7	72.3		2857	17.4	16.2	66.3	

Per cent 2000–2004

* p-value for difference between categories within each socio-demographic variable

Table 3: Snuff use among 15–16 year olds in socio-demographic groups.

	Boys					Girls				
	N	Daily (%)	Occasionally (%)	No snuff (%)	*P**	N	Daily (%)	Occasionally (%)	No snuff (%)	*P**
All participants	7762	5.8	15.6	78.6		7768	0.1	3.4	96.5	
Age, years										
14.5–15.6	1888	5.6	15.5	78.9	<0.849	1991	0.3	3.3	96.4	<0.058
15.6–15.9	1901	6.4	15.3	78.3		1974	0.1	3.5	96.4	
15.9–16.1	1956	5.3	15.8	79.0		1915	0.0	3.6	96.4	
16.1–18.4	1988	5.6	15.9	78.5		1872	0.0	3.2	96.9	
Parents' marital status										
Married/cohabiting	5135	5.0	14.2	80.8	<0.000	5152	0.1	2.9	97.0	<0.004
Divorced, separated, etc	2555	6.9	18.4	74.7		2587	0.1	4.3	95.6	
Parents' country of birth										
Norway	6737	6.3	16.7	77.0	<0.000	6786	0.1	3.7	96.2	<0.000
Country with majority of Muslims	583	0.3	6.5	93.1		550	0.0	0.9	99.1	
Other foreign countries	330	1.5	9.4	89.1		380	0.3	1.1	98.7	
Educational plans										
Academic studies	3320	4.2	12.5	83.3	<0.000	3942	0.1	2.6	97.3	<0.001
Upper secondary school, general studies	436	5.7	14.2	80.1		390	0.0	3.9	96.2	
Upper secondary school, vocat. studies	2420	7.9	19.6	72.6		1700	0.2	5.1	94.7	
One year of upp. sec. school/other plans	408	7.8	20.3	71.8		303	0.3	4.0	95.7	
Undecided	1053	4.2	15.3	80.5		1355	0.0	3.5	96.5	
Family economy										
Very well off	879	7.4	15.5	77.1	<0.164	603	0.2	3.5	96.4	<0.278
Well off	4186	5.7	15.6	78.7		4042	0.1	3.2	96.7	
In between	2347	5.3	15.7	79.0		2736	0.1	3.6	96.4	
Short of money	232	3.0	18.1	78.9		281	0.0	6.1	94.0	
Urban – rural areas										
Urban areas	4870	4.9	14.5	80.6	<0.000	4911	0.1	2.4	97.5	<0.000
Rural areas	2892	7.2	17.5	75.3		2857	0.1	5.1	94.8	

Per cent 2000–2004

* p-value for differences between categories within each socio-demographic variable

Pupils who considered their families short of money had a 5.8% higher risk of daily smoking than those who considered their families to be very well off. Daily smoking was positively associated with age (+2.5% from 1st to 4th quartile). Pupils living in rural areas had a small, but significantly decreased risk of daily smoking compared to those living in urban areas (-1.7%).

Occasional smoking

Patterns of occasional smoking were similar to daily smoking, but the associations with education were weaker (table 4, column II and figure 2). Pupils who were undecided about their educational plans had a slightly reduced risk of being an occasional smoker compared to academic oriented pupils. No age differences were found. Differ-

Table 4: Risk differences calculated from linear binominal regression models with outcome variables I–IV*

	I. Smoke daily no snuff N = 11351	II. Smoke occasionally no snuff N = 11539	III. Snuff (daily or occasionally) no smoke N = 10473	IV. Smoke and snuff. Combination users (daily or occasionally) N = 10932
Constant	1.3	11.2	11.9	13.1
Gender				
Boys	0.0	0.0	0.0	0.0
Girls (parents born in Norway)	11.9 (10.6, 13.2)	11.1 (9.7, 12.4)	-10.7 (-11.6, -9.7)	-11.2 (-12.4, -10.1)
Girls (parents born in country w. major. of Muslims)	-4.5 (-9.6, 0.6)	-1.8 (-7.2, 3.6)	-1.8 (-4.5, 1.0)	-5.0 (-8.9, -1.1)
Age, years				
Under 15.6	0.0	0.0	0.0	0.0
15.6–15.9	1.1 (-0.6, 2.8)	-0.8 (-2.6, 1.0)	0.4 (-0.9, 1.7)	0.1 (-1.5, 1.7)
15.9–16.1	1.5 (-0.2, 3.2)	-0.5 (-2.3, 1.4)	0.4 (-1.0, 1.7)	0.4 (-1.2, 1.9)
16.1–18.4	2.5 (0.8, 4.3)	-0.3 (-2.1, 1.6)	0.4 (-0.9, 1.7)	0.9 (-0.7, 2.5)
Parents' marital status				
Married/cohabiting	0.0	0.0	0.0	0.0
Divorced, separated, etc.	10.0 (8.5, 11.5)	3.3 (1.8, 4.8)	1.4 (0.3, 2.5)	4.5 (3.2, 5.9)
Parents' country of birth				
Norway	0.0	0.0	0.0	0.0
Country w. major. of Muslims (boys)	3.8 (0.7, 6.8)	-0.01 (-3.1, 3.0)	-9.7 (-11.4, -7.9)	-9.1 (-11.7, -6.5)
Country w. major. of Muslims (girls)	-12.7 (-19.6, -5.8)	-12.9 (-20.0, -5.8)	-0.8 (-4.4, 2.9)	-2.9 (-8.3, 2.5)
Other foreign countries	-2.4 (-5.2, 0.4)	-2.2 (-5.2, 0.8)	-4.5 (-5.8, -3.1)	-4.0 (-6.1, -1.9)
Education ambitions				
Academic studies	0.0	0.0	0.0	0.0
Upper secondary school, general studies	5.3 (2.5, 8.1)	2.6 (-0.4, 0.6)	2.0 (-0.2, 4.2)	2.5 (-0.01, 5.0)
Upper secondary school, vocat. studies	12.7 (11.1, 14.4)	1.7 (0.01, 3.3)	2.5 (1.4, 3.8)	9.1 (7.5, 10.7)
One year of upper sec. school/other plans	11.1 (7.4, 14.8)	4.0 (0.4, 7.6)	5.1 (2.1, 8.1)	6.9 (3.5, 10.3)
Undecided	1.0 (-0.7, 2.6)	-2.3 (-4.1, -0.5)	0.8 (-0.4, 2.0)	1.1 (0.4, 2.5)
Family economy				
Very well off	0.0	0.0	0.0	0.0
Well off	-2.3 (-4.4, -0.2)	-2.2 (-4.5, 0.04)	- 1.2 (-3.0, 0.6)	-2.2 (-4.2, -0.1)
In between	-0.5 (-2.8, 1.8)	-0.4 (-2.8, 2.1)	-2.7 (-4.6, -0.9)	-1.9 (-4.1, 0.3)
Short of money	5.8 (0.9, 10.6)	4.8 (-0.1, 9.7)	-2.9 (-6.0, 0.3)	1.4 (-2.9, 5.7)
Urban-rural				
Urban	0.0	0.0	0.0	0.0
Rural	-1.7 (-3.0, -0.3)	-2.4 (-3.8, -1.0)	1.0 (-0.04, 2.1)	1.7 (0.5, 2.9)

* The first line shows the constant term which equals expected tobacco use when all covariates are zero. The other lines show risk differences × 100 (with 95% confidence interval) for tobacco use. Zero values are the reference categories

ences between urban and rural areas showed similar results as for daily smoking.

Snuff use

The risk pattern for snuff use was different from smoking. Girls were less likely overall than boys to use snuff, particularly when the parents were born in Norway (table 4, col-

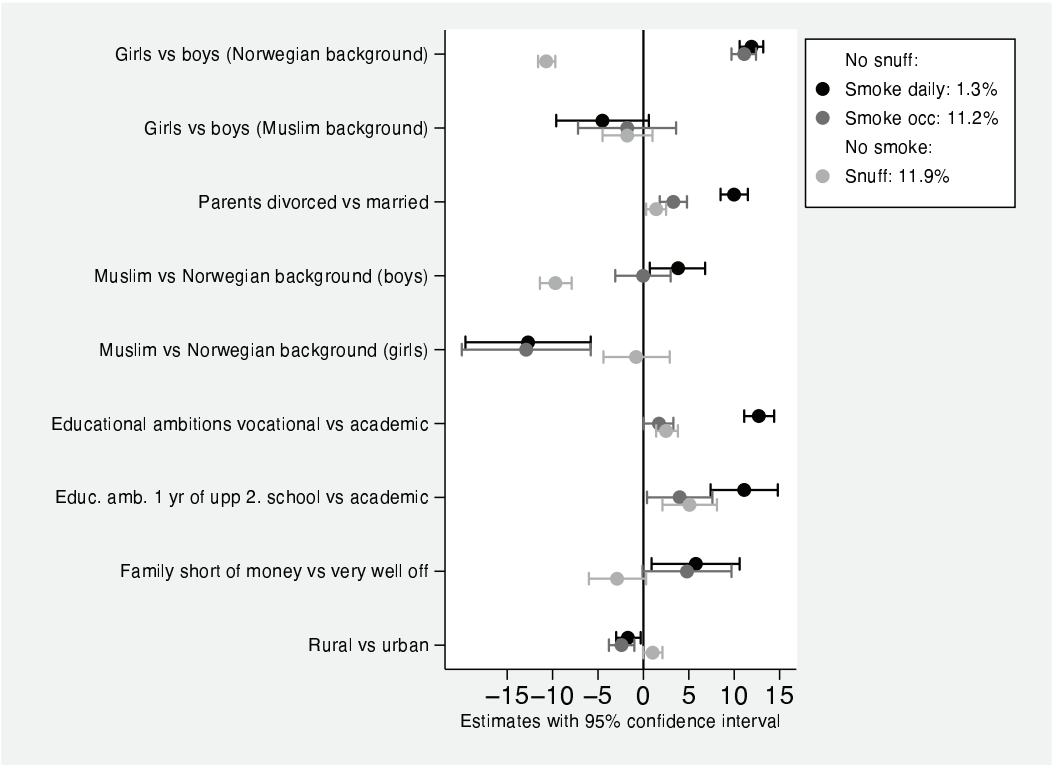

Figure 2
Risk factors expressed as risk difference × 100. The constant term (shown in box) equals expected tobacco use when all covariates are zero*. * Expected tobacco use for a boy in the youngest age quartile, with parents from Norway and living together in an urban area, with academic educational plans and considering his family economy to be very good.

umn III and figure 2). Boys with parents from countries with Muslim majority had a 9.7% lower risk of using snuff compared to boys with Norwegian parents. Boys and girls with parents born in other foreign countries also had a lower risk.

Regarding educational plans, the pattern for snuff use was similar to that of occasional smoking (figure 2). Snuff use was weakly associated with single parenthood and family economy. A lower risk of snuff use was found among pupils reporting "in between" family economy, and there was a tendency towards lower risk among the less well off compared with the very well off. No differences were found for age or urbanization.

We intended to include two different models on snuff use, one with daily use and one with occasional use, but the low number of girls using snuff daily limited the use of two separate models. Only small differences in user profiles between occasional and daily snuff users were found for boys. Poor family economy was associated with reduced risk (-4.6%) and single parenthood with increased risk (+2%) of daily, but not occasional use of snuff.

Combination use of smoking and snuff, versus non-use of tobacco

As for snuff alone, the factors "female" and "parents not born in Norway", whether from a country with Muslim influence or not, were associated with reduced risk of combining smoke and snuff (table 4, column IV). Similarly to smoking, combination use was associated with having divorced parents and plans for vocational study or one year of upper secondary school. The risk for combination use was lower for reported family economy "well off"

than for "very well off," and was higher in rural than in urban areas. No age differences were found.

Relative effects

Alternatively, relative effects can be calculated by using logistic regression. The following ORs (95% CI) may be compared to the risk differences in table 4: For daily smoking, pupils with single parents had an OR of 2.26 (CI 2.01–2.53) compared to those with parents living together. Pupils with ambitions for vocational studies had an OR of 2.89 (CI 2.53–3.29) compared to those with ambitions for academic studies. The OR was 1.37 (CI 0.99–1.89) for family economy "short of money" versus "very well off". The corresponding ORs for occasional smoking were 1.28 (single parents, CI 1.15–1.43), 1.14 (vocational studies, CI 1.00–1.31) and 1.33 (short of money, CI 0.98–1.82). For snuff use the ORs were 1.24 (single parents versus living together, CI 1.05–1.48), 1.48 (vocational versus academic studies, CI 1.22–1.80) and 0.63 ("short of money" versus "very well off," CI 0.35–1.13).

Discussion

Smoking was more prevalent among adolescents with vocational rather than academic ambitions, single parents, and poor self-reported family economy. Having parents from Muslim counties conferred an increased risk for boys and a decreased risk for girls for daily smoking, compared to adolescents with Norwegian parents. Snuff use and occasional smoking had weaker associations with educational ambitions, family economy and single parenthood than daily smoking. Combination use was associated with single parenthood and vocational study plans. Gender differences are generally found in Scandinavian countries, with higher prevalence of smoking among the girls and higher prevalence of snuff use among the boys [13,27,33].

The strengths of this study are the large and representative study population (nearly 16000 adolescents), high response rate (87%), and a standardized data collection with trained field personnel in all counties.

The main weakness of our study is that all information is self-reported and collected at one point in time [34]. Some pupils may over report their ambitions to attend academic studies and underreport their smoking habits for social desirability reasons, leading to stronger associations in the direction found in our study. Answers, however, were confidential and anonymous, which has been shown to lead to valid self-reported information on adolescent smoking [35-37]. Ethnicity divided only into three groups is a crude measure and was chosen because Muslim cultural influence is a factor known to affect the use of tobacco [30,31]. In the light of the low smoking rates for Muslim women, girls with parents from these countries may underreport their smoking habits due to social desirability [30].

The amount of tobacco used was not asked, which may lead to misclassification. A study from New Zealand showed that 30% of the adolescents reporting to be occasional smokers turned out to be daily smokers when they were asked about the frequency of smoking [37].

We did not have access to parental socioeconomic data in our study. Instead the pupils were asked to give a subjective assessment of the family economy. It is of increasing acceptance to use adolescents' own reports of social status instead of their often inaccurate reports of the SES of their parents [38]. One weakness with the binomial regression model used is that some covariate combinations may give negative smoking prevalence. These combinations are rare or non-existing in the data.

A positive relationship with age was found for smoking, but not for use of snuff or combination use. Worldwide, 19% of 13–15 year old non-smokers reported in 2000–2007 that they might start smoking during the next year [39]. Our analyses showed a higher prevalence of smoking and lower prevalence of combination use in urban than in rural areas. Little is known about the relationship between adolescent smoking and urbanization. Previous studies show the pattern among adults to differ between countries [40-43].

Our study supports previous findings that Muslim identification is associated with high smoking prevalence among men and low prevalence among women [30,31]. Adolescents with different cultural backgrounds have been found to influence each other's health behaviour. For example, in the Oslo part of our study, students with a Norwegian background drank alcohol less frequently when attending schools with a larger proportion of students with a Muslim background [44]. This cross-cultural effect on prevalence of smoking and snuff use seems, however, relatively small compared with overall differences in prevalence of smoking and snuff use between groups of adolescents with different country backgrounds. Further investigation into the cross-cultural effects of tobacco and snuff use is warranted.

Our study showed a negative association between smoking and adolescents' own judgement of family economy, in line with other studies finding a higher risk of tobacco use among adolescents in non-affluent families [45,46]. Our study is also in accordance with other studies showing a higher risk of tobacco use for adolescents with single parents compared with adolescents living with both parents [47-50]. One in four children in Norway are living

with only one parent [51], which often implies low income. As the mean age of the pupils in our study was 15.9 years and the initiation age for daily smoking 13.2 years, the probability is relatively high that establishment of the family economy and parents' divorce came before smoking initiation. This may give grounds for a cautious interpretation of these SES-variables as predictors.

Could smoking affect educational ambitions, as well as the opposite being the case? Academic ambitions may be influenced by tobacco use via mediating variables such as attachment to peers with higher or lower academic ambitions. Interestingly, a follow-up study of 16 and 18 year old pupils in Finland found smoking to predict attained educational level. Adolescents' health related lifestyle, rather than health status, with smoking as the strongest predictor, had impact on later educational level. Smoking was considered to be a marker of a broader lifestyle, combined with a rejection of an achievement ideology and the adoption of an anti-school orientation. The number of cigarettes smoked was found to be negatively associated with later educational level [52]. As occasional smokers consume fewer cigarettes than daily smokers, this finding is in line with our finding that occasional smokers had higher educational ambitions than daily smokers, but not as high as non-smokers.

Adolescents' educational ambition has been used as a social indicator by others and is found to correlate with school marks and parents' education level [53,54]. Our results support earlier findings that academic orientation as well as school performance is shown to be closely associated with adolescents' health and health-related behaviour, including smoking [27,55,56]. These associations may be due to parental influence or other factors in the social environment. Peer, teacher and environmental influence may also differ between vocational and academic school-classes [57].

The negative association found between SES and daily smoking was expected. Several other studies confirm these findings among adolescents [19] and it is consistent with Norway being in the late stage of the tobacco epidemic, where the prevalence of smoking continues to decline and gradually reaches a stable minimum level. The decline in prevalence of smoking among lower SES groups lags behind the decline in higher SES groups [20,58].

We expected a positive association between SES and occasional smoking. We found, however, a negative association, although weaker than for daily smoking. A study among 16–18 year old students from Norway found occasional smokers to be in higher academic courses than daily smokers, in line with the differences in educational ambitions in our study [59].

In studies on adults, occasional smokers had higher education levels than daily smokers [24,26]. Our study of a younger age group may indicate a shift to lower SES for occasional smokers, as the tobacco epidemic in general is on the decline. In a Norwegian study from 2006, adolescents rated the "smoker prototype" as less attractive than the "non-smoker-prototype," even amongst regular smokers [60]. Being a non-smoker was associated with being independent, smart and self-confident, indicating that the attitudes towards any type of smoking are slowly changing to be more negative. The spread of attitudes about tobacco use from higher to lower SES levels has been described [18,20,58]. Young people today may be some of the first to adopt a wave of negative attitudes towards occasional smoking, with young people in higher socio-economic groups leading on with tobacco-free practice, and others adopting the negative attitude while still using tobacco.

We had expected less SES difference for snuff use than for daily smoking. This expectation was met regarding educational ambitions and parents' marital status. In a Swedish city, 18 year old students in vocational courses were nearly twice as likely to use snuff as students in academic programmes [27]. Adolescents' own educational orientation was used as a measure, with the results corresponding to our findings using educational ambitions as a measure. Subjective family economy in our study was positively associated with daily snuff use among boys. Our results indicate that snuff use is associated with a higher SES than daily smoking, although snuff use may undergo a similar shift as smoking, starting with decreasing prevalence of use in higher socio-economic groups, and young people being the first to change their habits.

Conclusion

In a time of rapid changes in tobacco use, in particular among adolescents, it is important to recognize subgroups at high risk. Our study has clearly indicated high-risk for tobacco use among those with ambitions for a vocational rather than academic career, and from less affluent or single parent families. The social and family background differences were largest for daily smoking and less pronounced for occasional smoking and snuff use. There may be an ongoing shift towards lower SES among all groups of tobacco users, including occasional smokers and snuff users. The trends for smoke and smokeless tobacco should be followed, as well as factors contributing to the start and cessation of tobacco use.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

LG analysed the data, drafted the manuscript and contributed to the literature review. HS gave methodological

advises and took part in writing the methods section. RH and SGI took the initiative to conduct the study and, contributed to result interpretation and commented on the drafts. RH contributed to the literature review and SGI contributed to the study design, and supervised the drafting of the manuscript. All authors read and approved the final manuscript.

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PAPER III

Patterns of snus and cigarette use: A study of Norwegian boys followed from age 16 to 19

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Patterns of snus and cigarette use: a study of Norwegian boys followed from age 16 to 19

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ABSTRACT

Background The use of moist snuff (snus) in young Norwegians is increasing, while smoking rates are declining. It is not clear whether snus facilitates smoking.

Objective To assess whether boys at 16 years who were never-smokers, but snus users in 2001, had an increased risk of smoking 3 years later.

Methods In a prospective school-based cohort study, 1,440 boys who responded to questionnaires in 2001 and 2004, were included in the analyses. The participation rate was 89% in 2001 and 50% in 2004. Multinomial logistic regression models were used to assess

the odds ratio (OR) of snus users, smokers and dual users of cigarettes and snus, compared to non-tobacco-users at baseline, to be smokers at follow-up.

Results Snus use at baseline was associated with increased odds of dual use at follow-up when the outcome was (1) current dual use versus no tobacco (OR=3.49, 95% CI 1.8-6.8), and when the outcome was (2) current dual use versus no smoking, but including snus only use (OR=1.88, 95% CI 1.1-3.3). Baseline snus users who were dual users at follow-up seemed to prefer using snus daily and cigarettes occasionally. Use of snus only at baseline was not associated with increased odds of smoking only at follow-up, after adjusting for known risk factors.

Conclusion Young males who only used snus at baseline had an increased risk of being dual users at follow-up. Snus use may therefore act as a facilitator for smoking.

The smokeless tobacco (ST) marketed in Norway is a not-fermented, moist tobacco product which is held behind the upper lip, known as snus. Since 2000 the daily use of snus increased from < 5% to 25% among young men, and from almost nothing to 8% among young females. In 2010, an additional 8-10% among both genders used snus occasionally. During this period smoking rates in Norway have declined. In 2010 12% of young adults (16-24 years) smoked daily and 14% occasionally. Hence, snus use is now more common than smoking among young men.[1]

Research reports concerning the health effects of ST are conflicting, however most researchers agree that ST is less harmful than cigarettes on an individual basis.[2 3] There is less agreement on the health consequences of ST use at the population level. Some studies indicate that ST is likely to produce a net health benefit through replacing smoking, while others find it unlikely that increased use of ST will give any substantial health benefits, when dual use of cigarettes and snus is taken into account.[4 5] A crucial question is whether ST

could lead to smoking, especially among young people. Some studies among young adults and adolescents from the US and Sweden conclude that ST use alone is not a significant risk factor for the later use of cigarettes, [6-8] while other studies have reported that ST use increases the probability of taking up smoking in adolescent and young American men.[9-12]

Whether ST use is found to be a facilitator for smoking may depend on the statistical modelling used, including definitions of the outcome and current tobacco use, and whether risk factors other than ST are included in the models. Conflicting results may also be due to heterogeneity between populations, where attitudes to, and availability of, cigarettes and ST may influence the likelihood of transition between the tobacco types. Regulations of use, such as smoking bans in Norwegian restaurants and bars from 2004, may also affect the transition between tobacco products. The question if snus use may increase the risk of taking up smoking is also referred to as the "gateway hypothesis".[7 9] Two recent reviews concluded that more knowledge is needed to determine whether ST use leads to smoking.[2 13]

The purpose of this study was to investigate changes in tobacco use from age 16 to 19. Specifically, we wanted to assess whether boys who were never-smokers, but snus users, at baseline had an elevated risk of smoking 3 years later, after adjustment for known risk factors for smoking.

METHODS

Baseline and follow-up survey

All 10th graders (16 year olds) in Oslo County were invited to participate in the youth part of the Oslo Health Study during 1999-2000 and 2000–2001. A corresponding health study was performed in the predominantly rural county Hedmark in 2000-2001. In both counties nearly all public and private schools participated. The survey was performed during school hours, and standardized explanations about the questionnaire were given by trained personnel.[14] In

total, 5,750 pupils participated at baseline, 89% of all pupils in participating schools in the 2001 cohort; 3,811 in Oslo and 1,939 in Hedmark. The follow-up study was carried out in 2004, mainly at schools in Oslo and as a postal survey in Hedmark, with procedures as in the baseline study. All upper secondary schools in Oslo participated, and the 13th graders were given a questionnaire during school class. Baseline study participants who agreed to participate at follow-up, but were not enrolled in school at age 19, were invited to participate by mail. Two reminders were sent to non-respondents.[15]

Study population

Only boys were selected for the present study because of low baseline prevalence of snus use among girls. Less than 1% of the girls were snus users (totally 30% using tobacco) at baseline, 7% at follow-up (totally 41% using tobacco). Of the 1,923 male participants in the baseline survey in Oslo 1,113 (58%) participated in the follow-up survey with full consent to a data linkage (figure 1). The corresponding figures in Hedmark were 971 and 327 (34%). A total of 1,440 participated (50% response rate), of whom 1,395 responded to the questions about tobacco (figure 1). Loss to follow-up was associated with non-western ethnicity, postal survey compared to school-based, and low educational ambitions.[16]

Main outcome variables

Smoking and use of snus were assessed by questions that separated never, former and current users, where current use was recorded as occasional or daily use. Questions were similar at baseline and at follow-up: “Do you smoke, or have you ever been smoking?” (tick one box only). The four response categories were: No, never; Yes, but I have quit; Yes, occasionally; Yes, every day. The question about snus was worded “Do you use, or have you ever been using snus, chewing tobacco or similar products?” with the same response categories as for

smoking. In the analyses, four mutually exclusive groups were categorized into: Daily or occasional snus use, but no smoking; Daily or occasional smoking, but no snus use; Dual use of snus and cigarettes; No current tobacco use, including former tobacco users. There were missing values for one or both questions on smoking and snus use for 2.3% of participants at baseline and 0.6% at follow-up.

Other variables

Household smoking at baseline was assessed with the following question**:** "Do any of the people you live with smoke?" with five answer categories: Mother; Father; Sibling; Others; Nobody. A comparable question about snus was not asked. A dichotomous variable for alcohol use was created (Have never been drunk; Have been drunk once or more) based on the following question: Have you ever had so much alcohol that you got drunk?" Sexual experience was dichotomised based on the question "Have you ever had sexual intercourse?" with the answer categories: Yes, with one partner; Yes, with several partners; No. The first two categories were combined in analyses.

Age was dichotomized at the median in the total sample. Parents' marital status was categorized as: Married or cohabiting; Divorced, separated, unmarried, widowed or "other". Cultural background was classified according to parents' country of birth, self-reported by adolescents at baseline. Muslim cultural background was addressed because it affects the use of tobacco, with high smoking prevalence among adolescent boys.[17] Educational ambitions was categorised into five groups: Academic studies at master or bachelor level; Upper secondary school, general studies; Upper secondary school, vocational studies; One year at upper secondary school/ other plans; Undecided. The pupils' consideration of their family economy was assessed by asking if their family, compared to other families in Norway, were probably "very well off", "well off", "in the middle" or "short of money". All variables in

table 1 are of demographic or socioeconomic character. Socioeconomic status has been shown to be negatively associated with adolescent smoking, while less is known about snus use.[18-20]

Statistical analysis

The impact of baseline snus use on smoking at follow-up was assessed in multinomial logistic regression (mlogit), where maximum-likelihood multinomial logit models were fitted using STATA, version 10.0. The model was a modification of a binary logistic regression model, with a nominal outcome variable with more than two levels. The effect size from the STATA output is relative risk ratio (RRR), which may be interpreted as odds ratio (OR).[21] Two models with different outcome variables of current tobacco use at follow-up were used: 1) Snus only use, smoking only and dual use, regressed against no tobacco use, and 2) Smoking only and dual use, regressed against no smoking but possible use of snus. Hence, in the second model the reference group contained also the snus users. Both models assessed the odds ratio (OR) of snus users, smokers, and dual users, compared to non-tobacco-users at baseline, of becoming smokers at follow-up. The same baseline tobacco variable with mutually exclusive groups of snus only, smoking only and dual use were used in both models as dummy variables. The same models were also carried out with a more detailed outcome-variable of current tobacco use at follow-up: occasional snus only, daily snus only, occasional smoking only, daily smoking only, and with the four corresponding values of dual use (see table 2, detailed). In the detailed analyses, small groups led to some limitations in the interpretation of the results.

From known baseline risk factors for tobacco use as shown in table 1, those associated with tobacco use both at baseline and follow-up were included in the models as possible confounders. In the final models only the confounding variables were kept. A multiplicative interaction term “smoking by snus use” at baseline was included in the

preliminary analyses. To get interpretable OR's we used dummy variables for baseline tobacco use. Similarly, the significance of the interaction of tobacco with alcohol use, sexual experience and family economy was assessed.

RESULTS

Characteristics of participants

Participants' mean age at baseline was 15.9 years (range 14.7-17.4) and 18.7 years at follow-up. At baseline 6% used snus, 13% smoked, 10% were dual users and 71% were tobacco-free (table 1). The use of tobacco was higher among those invited to follow-up, but not attending (1,186 boys). The prevalence of snus use was the same in both groups, but among those not attending 18% smoked, 14% were dual users and only 61% were tobacco-free. A higher percentage of cohort participants compared to non-participants had parents who were married or cohabiting, had good or very good family economy, and were planning an academic study course.

Table 1 Baseline characteristics by use of tobacco among 16 year old boys [1,2]

	Total N (%)	Snus, but no smoke N (%)	Smoke, but no snus N(%)	Dual use N (%)	No tobacco N (%)	p-value
	1395 (100)	90 (6)	175 (13)	144 (10)	986 (71)	
Age, years						
Below median (mean 15.6)	701 (100)	43 (6)	80 (11)	65 (9)	513 (73)	
Above median (mean 16.1)	694 (100)	47 (7)	95 (14)	79 (11)	473 (68)	
Total	1395 (100)	90 (6)	175 (13)	144 (10)	986 (71)	p=<0.220
County						
Oslo	1078 (100)	73 (7)	136 (13)	105 (10)	764 (71)	
Hedmark	317 (100)	17 (5)	39 (12)	39 (12)	222 (70)	
Total	1395 (100)	90 (6)	175 (13)	144 (10)	986 (71)	p=<0.502
Parents' marital status						
Married/ cohabiting	1012 (100)	64 (6)	109 (11)	101 (10)	738 (73)	
Divorced, separated etc.	378 (100)	24 (6)	66 (17)	43 (11)	245 (65)	
Total	1390 (100)	88 (6)	175 (13)	144 (10)	983 (71)	P=<0.005
Parents' country of birth						
Norway	1175 (100)	84 (7)	147 (13)	129 (11)	815 (69)	
Country with majority of Muslims	132 (100)	3 (2)	18 (14)	4 (3)	107 (81)	
Other foreign countries	80 (100)	2 (3)	8 (10)	10 (13)	60 (75)	
Total	1387 (100)	89 (6)	173 (12)	143 (10)	982 (71)	p=<0.009
Educational plans						
Academic studies	808 (100)	53 (7)	84 (10)	75 (9)	596 (74)	
Upper secondary school, general studies	78 (100)	5 (6)	11 (14)	10 (13)	52 (67)	
Upper secondary school, vocational studies	252 (100)	16 (6)	47 (19)	38 (15)	151 (60)	
One year of upper secondary school or other plans	52 (100)	4 (8)	9 (17)	5 (10)	34 (65)	
Undecided	194 (100)	11 (6)	23 (12)	16 (8)	144 (74)	
Total	1384 (100)	89 (6)	174 (13)	144 (10)	977 (71)	p=<0.013
Perceived family economy						
In between /short of money	411 (100)	13 (3)	52 (13)	46 (11)	300 (73)	
Well off	809 (100)	59 (7)	97 (12)	82 (10)	571 (71)	
Very well off	163 (100)	18 (11)	23 (14)	16 (10)	106 (65)	
Total	1383 (100)	90 (7)	172 (12)	144 (10)	977 (71)	p=<0.021

Family smoking						
No family member smokes	722 (100)	42 (6)	69 (10)	58 (8)	553 (77)	
Father **or** mother smokes	322 (100)	27 (8)	35 (11)	33 (10)	227 (70)	
Father **and** mother smoke	137 (100)	7 (5)	24 (18)	9 (7)	97 (71)	
Siblings and/ or others smoke	209 (100)	14 (7)	47 (22)	44 (21)	104 (50)	
Total	1390 (100)	90 (6)	175 (13)	144 (10)	981 (71)	p=<0.0001
Alcohol use						
Have never been drunk	694 (100)	11 (2)	35 (5)	3 (0.4)	645 (93)	
Have been drunk once or more	695 (100)	78 (11)	139 (20)	140 (20)	338 (49)	
Total	1389 (100)	90 (6)	174 (13)	143 (10)	983 (71)	p=<0.0001
First sexual experience by 10th grade or sooner						
No	1147 (100)	73 (6)	116 (10)	87 (8)	871 (76)	
Yes	228 (100)	17 (7)	58 (25)	55 (24)	98 (43)	
Total	1375 (100)	90 (7)	174 (13)	142 (10)	969 (70)	p=<0.0001

[1] Total number of participants is less than 1395 if the given variable had missing data

[2] p-value: test for independence between the socio-demographic and the tobacco variable at baseline

Bivariate analyses

Use of tobacco did not vary by age, but was higher among those who had divorced parents, were planning a vocational education course, or perceived family economy "very well off". High total prevalence of tobacco use among boys with parents born in Norway and among those in perceived affluent families were mainly due to higher rates of snus use. Adolescents' snus use was higher if one of the parents smoked. Smoking and dual use was higher in families where siblings smoked. Alcohol users were often also tobacco users. Tobacco users were overrepresented among adolescents with early sexual experience and high alcohol consumption (table 1).

Among the snus only users at baseline, 37% maintained their snus use at follow-up, 11% switched to be smokers-only, and 28% became dual users at follow-up (table 2, aggregated). Boys using snus only at baseline were more likely to be tobacco-free at follow-up (24%), than smokers and dual users (both 14-15%). The total prevalence of tobacco use increased from 29% at baseline to 48% at follow-up, and at the same time the proportion of daily users increased. Analyses of occasional versus daily tobacco use among boys (table 2, detailed) showed that 56% of the baseline dual users used at least one product daily. The corresponding proportion was 68% at follow-up. Only a small proportion of dual users were daily users of both products (8% at baseline and 5% at follow-up).

Table 2 Current tobacco use among boys at baseline (2001) and at follow-up (2004). Unadjusted analyses, number (%)

TOBACCO USE AT FOLLOW-UP

TOBACCO USE AT BASELINE

Aggregated view

	No tobacco	Snus only	Smoke only	Dual use	All
No tobacco	659 (67)	113 (12)	114 (12)	100 (10)	986 (100)
Snus only	22 (24)	33 (37)	10 (11)	25 (28)	90 (100)
Smoke only	25 (14)	12 (7)	75 (43)	63 (36)	175 (100)
Dual use	21 (15)	25 (17)	23 (16)	75 (52)	144 (100)
All	727 (52)	183 (13)	222 (16)	263 (19)	1395 (100)

Detailed view

	No tobacco	Snus only		Smoke only		Dual use				All
		Occ.	Daily	Occ.	Daily	Both occ.	Occ. smoke, daily snus	Daily smoke, occ. snus	Both daily	
No tobacco	659	70	43	73	41	44	23	30	3	986
Occ. snus only	20	15	11	8	2	5	8	3	1	73
Daily snus only	2	2	5	0	0	2	4	1	1	17
Occ. smoke only	20	4	6	20	20	15	9	16	3	113
Daily smoke only	5	2	0	7	28	2	3	14	1	62
Both occ.	16	7	8	3	3	12	13	1	0	63
Both occ. smoke and daily snus	2	0	4	0	1	0	8	1	2	18
Both daily smoke and occ. Snus	2	0	2	1	15	3	4	24	1	52
Both daily	1	1	3	0	0	0	1	3	2	11
All	727	101	82	112	110	83	73	93	14	1395

Regression analyses

In the first multinomial model, snus only use at baseline was not associated with increased odds of smoking only at follow-up (OR 1.66, 95% CI 0.7-3.8) (table 3). The odds for snus users to be dual users at follow-up was elevated (OR 3.49, 95% CI 1.8-6.8) compared to being tobacco-free. The OR to continue as snus only users at follow-up was 5.50, 95% CI 3.0-10.3. Baseline smokers had high odds of remaining smokers or becoming dual users at follow-up, but the odds for switching from smoking only to snus only was not significant. Baseline dual users had high odds of still being dual users at follow-up, while the OR to become smokers only was 5.19 (95% CI 2.6-10.4), and the OR for changing from dual use to snus only was 4.02 (95% CI 2.0-7.9) (table 3).

Table 3 Male tobacco use vs no tobacco use at follow-up (2004) according to baseline risk factors, multinomial logistic regression[1,2]

	Current snus only use vs no tobacco at follow-up 2004		Current smoking only vs no tobacco at follow-up 2004		Current dual use vs no tobacco at follow-up 2004	
	Unadjusted	Full model	Unadjusted	Full model	Unadjusted	Full model
N=1361	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)
Current tobacco use at baseline 2001						
No tobacco	ref	ref	ref	ref	ref	ref
Snus only use	8.68 (4.88-15.43)	5.5 (2.95-10.25)	2.73 (1.26-5.92)	1.66 (0.73-3.80)	7.00 (3.78-12.96)	3.49 (1.79-6.82)
Smoking only	2.89 (1.41-5.95)	1.53 (0.71-3.31)	18.00 (10.86-29.83)	15.94 (9.20-27.59)	16.85 (10.07-28.21)	12.59 (7.19-22.06)
Dual use	6.33 (3.39-11.83)	4.02 (2.04-7.93)	6.57 (3.51-12.29)	5.19 (2.60-10.38)	22.62 (13.34-38.37)	15.38 (8.49-27.87)
Previous smoking						
No	ref	ref	ref	ref	ref	ref
Yes	1.71 (0.98-3.00)	1.01(0.54-1.89)	1.93 (1.15-3.22)	2.96 (1.69-5.19)	2.01 (1.25-3.24)	2.87 (1.67-4.95)
Previous snus use						
No	ref	ref	ref	ref	ref	ref
Yes	3.23 (1.79-5.84)	2.55 (1.32-4.92)	3.10 (1.76-5.48)	1.04 (0.53-2.05)	2.92 (1.70-5.04)	1.24 (0.64-2.39)
Perceived family economy						
In between /short of money	ref	ref	ref	ref	ref	ref
Well off	1.92 (1.28-2.90)	1.8 (1.17-2.77)	0.87 (0.62-1.22)	0.95 (0.65-1.37)	1.42 (1.02-1.97)	1.58 (1.08-2.32)
Very well off	2.46 (1.39-4.37)	1.99 (1.08-3.66)	1.12 (0.66-1.90)	1.07 (0.60-1.91)	1.97 (1.21-3.19)	1.84 (1.05-3.22)
Alcohol use						
Have never been drunk	ref	ref	ref	ref	ref	ref
Have been drunk once or more	4.43 (3.11-6.30)	2.54 (1.69-3.82)	3.13 (2.28-4.30)	1.36 (0.92-2.01)	6.21 (4.50-8.57)	2.01 (1.35-2.99)
First sexual experience by 10th grade or sooner						
No	ref	ref	ref	ref	ref	ref
Yes	1.92 (1.19-3.07)	1.17 (0.70-1.96)	3.47 (2.33-5.17)	1.94 (1.23-3.05)	4.07 (2.81-5.89)	1.82 (1.18-2.82)

[1] Multiplicative interaction between smoking and snus use is taken into account by current dual use of tobacco

[2] The baseline-variables age, parents' marital status, county, parents' country of birth, pupils' educational plans and family members smoking did not influence the association between tobacco use at baseline and at follow-up and were left out

The second multinomial model with the same baseline tobacco variable as in table 3, but with the outcome reference “no smoking”, including the snus only users, is presented in table 4. We found no elevated risk of baseline snus users becoming smokers only (OR 0.86, 95% CI 0.4-1.8), but baseline snus use was associated with increased odds of dual use at follow-up (OR=1.88, 95% CI 1.1-3.3). The OR for baseline smokers to remain smokers (OR=13.31, 95% CI 8.2-21.6) or to become dual users (OR=10.74, 95% CI 6.6-17.6) was high. Baseline dual users had high odds of remaining dual users (OR=9.28, 95% CI 5.7-15.2) or becoming smokers only (OR= 3.29, 95% CI 1.8-6.0).

Table 4 Male tobacco use vs no smoking at follow-up (2004) according to baseline risk factors, multinomial logistic regression[1,2]

	Current smoking only vs no smoking (tobacco free and snus only use) at follow-up 2004		Current dual use vs no smoking (tobacco free and snus only use) at follow-up 2004	
	Unadjusted	**Full modell**	**Unadjusted**	**Full model**
N=1370	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)
Current tobacco use at baseline 2001				
No	ref	ref	ref	ref
Snus only use	1.28 (0.63 - 2.58)	0.86 (0.40 - 1.81)	3.31 (1.96 - 5.59)	1.88 (1.06 - 3.33)
Smoking only	13.87 (8.89 - 21.61)	13.31 (8.20 - 21.60)	12.92 (8.19 - 20.40)	10.74 (6.56 - 17.57)
Dual use	3.67 (2.13 - 6.32)	3.29 (1.79 - 6.04)	12.77 (8.33 - 19.57)	9.28 (5.68 - 15.17)
Previous smoking				
No	ref	ref	ref	ref
Yes	1.69 (1.04 - 2.75)	2.92 (1.71 - 4.97)	1.78 (1.14 - 2.79)	2.84 (1.72 - 4.70)
Alcohol use				
Have never been drunk	ref	ref	ref	ref
Have been drunk once or more	2.37 (1.74 - 3.21)	1.15 (0.79 - 1.67)	4.62 (3.38 - 6.31)	1.72 (1.18 - 2.51)
First sexual experience by 10th grade or sooner				
No	ref	ref	ref	ref
Yes	2.98 (2.06 - 4.33)	1.82 (1.20 - 2.76)	3.46 (2.46 - 4.87)	1.72 (1.16 - 2.55)

[1] Multiplicative interaction between smoking and snus use is taken into account by current dual use of tobacco

[2] The baseline-variables age, parents' marital status, family economy, county, parents' country of birth, pupils' educational plans, previous snus use and family members smoking did not influence the association between tobacco use at baseline and at follow-up and were left out.

In a supplementary, more detailed analysis (not shown in tables), we performed multinomial models with the outcome-variable separated into occasional and daily tobacco use. These models essentially confirmed the results from table 3 and 4.

Corresponding to table 3, baseline snus users had no increased OR to be either occasional or daily smokers at follow-up, but an OR of 4.85, 95% CI 2.3-10.2 of becoming occasional snus users, and an OR of 6.70, 95% CI 3.0-14.8 of becoming daily snus users. Dual users originating from baseline snus use, seemed to be daily snus users and occasional smokers (OR 7.42, 95% CI 2.9-18.7) rather than the opposite; daily smokers and occasional snus users (association not significant). Baseline dual users had increased odds ratios to be all kinds of dual users at follow-up, as well as daily smokers (OR 13.05, 95% CI 5.7-29.7) or daily snus users (OR 6.84, 95% CI 3.1-15.3).

Further, baseline smokers had high odds to be both occasional (OR 9.05, 95% CI 4.7-17.6) and daily (OR 29.86, 95% CI 15.2-58.6) smokers at follow-up, but no increased OR to become snus users. Baseline smokers had high odds to be dual users of both products occasionally at follow-up (OR 7.07, 95% CI 3.3-15.2), to be dual users of daily snus and occasional smoking (OR 7.64, 95% CI 3.1-18.7) and of daily smoking and occasional snus use (OR 29.20, 95%CI 13.6-62.8).

Corresponding to table 4, baseline snus users had no increased OR to be either occasional or daily smokers at follow-up. Also in this model, baseline snus use was associated with dual use of daily snus and occasional smoking at follow-up (OR 3.54, 95% CI 1.5-8.3), whereas no association was found with dual use of daily smoking and occasional snus use. Again, baseline smoking was associated with all kinds of dual use at follow-up. Baseline dual users had increased odds to be daily smokers (OR 7.94, 95% CI 3.7-16.9) at follow-up, as well as all kinds of dual users.

The interaction term between smoking and snus use was incorporated in the models with the inclusion of tobacco dummy variables. No other interaction terms reached statistical significance.

DISCUSSION

Baseline snus users had increased odds for taking up smoking in addition to continuing their snus use. There was no trend, however, of switching from use of snus alone to cigarettes alone. Baseline smokers only carried a high risk of remaining smokers at follow-up, but were not more likely than baseline non-users of tobacco to use snus as the only tobacco product at follow-up. The odds for dual users at baseline to remain dual users or smokers were high. Baseline dual users were more likely than baseline non-users of tobacco to become users of snus only. Finally, baseline snus users who were dual users at follow-up had increased odds of being daily snus users and occasional smokers, while baseline smokers had increased odds to be all kinds of dual users at follow-up.

Strengths and limitations

Our study has several strengths; it has a high participation rate at baseline, and includes adolescents in both urban and rural areas. Furthermore, the baseline study was performed prior to the segregation of adolescents into theoretical and practical school courses. Also, the data collection was standardized with trained field personnel at both points in time. Another strength is that established risk factors for smoking could be adjusted for, and we had the opportunity to include the variables “previous smoking” and “previous snus use” at baseline, which were acting as powerful factors in the multivariate analyses.

One limitation of our study is that the participants in our follow-up study were not fully representative of the population of 16-19 year olds, with a participation rate of only 50%. However, as smoking and established risk factors for smoking were relatively more common among non-participants at follow-up, the transition from use of snus to smoking or to dual use would most probably have been equally or more pronounced among the non-participants. We think the difference between participants and non-participants in the follow-up study probably did not lead to bias in our analyses, as transitions between snus and smoke, not the absolute prevalence, were of interest in this study.

As the amount of tobacco used was not asked in our study, we did not have the opportunity to separate light from heavy users. Both light and heavy users may be hidden behind the category "daily use", and the diversity within "occasional use" should also be further explored in future studies. The appropriate way of asking youth has to be considered in light of the un-established tobacco use habits in the youngest age groups, and weighted against the tendency to skip difficult questions. Uncertainty related to the classification of "occasional" and "daily" tobacco use among young people[22] was taken into account by grouping occasional and daily users together in the categories "snus users", "smokers" or "dual users" in the main analyses in our study. The validity of adolescent self reported tobacco use has been demonstrated, even when higher discrepancy was found among those reporting non-daily use.[23] Among the dual users in our study, the majority were daily users of at least one substance, which corresponds well with a recently proposed definition of dual use as daily use of one substance and at least weekly use of the other.[24]

Another limitation in our study is the inclusion of boys only, because of nearly no baseline snus users among girls. The epidemiology of tobacco use shows quite large gender differences in general, and our results are not valid for girls. Also, the results may be valid

only for countries that are similar to Norway, because the attitudes to the different tobacco products, their availability and regulations of use differ between countries.

Our follow-up survey was carried out in spring 2004 and later the same year the ban on cigarette smoking in restaurants and bars was introduced in Norway. In a comparable survey today this ban would possibly have influenced the results. In particular, young smokers might have a higher tendency to quit all tobacco or to switch to snus alone, as smoking has become more inconvenient. Future studies should assess all kinds of tobacco use in larger study groups than ours, including girls and with longer follow-up, for being able to elucidate details relevant changes in this phase of the tobacco epidemic.

Modelling of smoking behaviour

Previous smoking was an important factor in this study. Even at the baseline age of 16, nearly one tenth reported previous smoking. When not adjusting for the variable "previous smoking", baseline snus only users had a significantly higher odds of switching to smoking only at follow-up, but when adjusting for this smoking experience, the result was changed. This is in line with Kozlowski,[7] but Severson found ST use to increase the odds among adolescent boys for taking up regular smoking, when including only those reporting no lifetime smoking at baseline.[10] In any case, previous smoking points out as an important factor that should always be addressed when transitions from snus use to smoking is discussed. Timberlake used a method of matching pairs of users and non-users of ST with the same behaviour risk profile, also taking lifetime smoking into account.[8] Our result was in line with Timberlake, finding that use of snus only did not facilitate smoking only, though the analytic methods were different.

The choice of reference group for the outcome variable influenced our study findings. No use of tobacco at follow-up is the "gold standard" reference, but we also chose to use non-smokers as reference at follow-up. We wanted to study transitions between snus use and smoking, regardless of whether the boys were snus only users at follow-up, because use of snus alone is a smaller health problem compared to smoking. A clear definition of the reference group of the outcome variable has not always been given in studies, which is a problem for comparability and interpretation of the results. Recent reviews discussed how different definitions and models lead to different answers to the question of whether ST use increases the risk of smoking initiation.[2 13]

Dual use of cigarettes and snus

In our study, dual tobacco use at baseline increased the odds to be a daily snus user or a daily smoker at follow-up. The odds of remaining a dual user at follow-up was high. This is important, as we found that baseline snus use increased the odds of ending up with dual use. An important question is whether young adult dual users may become smoke-free or tobacco-free later. As dual users who were previously snus only users often use snus as their main product at follow-up, the health hazards may be less serious, but the likelihood of quitting tobacco not necessarily higher than among dual users with cigarettes as their main product. Among Swedish adolescents, dual users constituted a high risk group for tobacco dependence and tobacco-related harms.[6 25] In USA, dual users planned to quit less often than those who smoked cigarettes exclusively; 42% of dual users had no plans to quit smoking the next 6 months, and most of them reported ST use in locations with restrictions on smoking.[26] A summary of Scandinavian epidemiological tobacco studies, finds the prevalence of dual use among adolescents higher than among adults, and suggests that many tobacco users are trying both products, but then settling for one in adulthood.[13] Nevertheless, adolescents using both

snus and cigarettes are at high risk of remaining in tobacco dependence, as Scandinavian snus has nicotine content comparable to cigarettes and is by no means easier to quit.[3 27 28]

The overall prevalence of tobacco use was high among the boys studied, with nearly half using tobacco at follow-up. When data was collected for this study, girls had a high prevalence of smoking, but very low prevalence of snus use. In the years following this study, prevalence of daily or occasional use of snus has increased in both genders, to around 16 % in young females.[1] This implies a high prevalence of nicotine dependency in the generation now entering adulthood, even though smoking rates are declining. Dual use of snus and cigarettes seems to be gaining ground, and the prevalence is high among the young men in our study. The prevalence of daily tobacco use was 11% in our cohort at baseline in 2001 and 14% among 15 year old Norwegian boys in 2005.[29] This may indicate that total use of tobacco products is not declining, even though smoking rates among adolescents decreased between 2000 and 2005. A comparison to other studies is difficult, as most studies report smoking and snus use separately. Preventive measures against use of both tobacco types are needed to avoid an increasing proportion of young adults becoming addicted to nicotine, and thus ready to use any available product. Prevention efforts and help with tobacco cessation should have a dampening effect on the increasing proportion of snus users unable to quit. Future studies should assess all kinds of tobacco use, in large study groups, and with longer follow-up, for being able to elucidate relevant changes in this phase of the tobacco epidemic.

Conclusion

We found that snus only use in early adolescence was associated with the increased risk of taking up occasional smoking in addition to snus in late adolescence. Snus only use at baseline was not associated with the risk of becoming smokers only. Our results indicate an

increasing proportion of both snus users and dual users among young adults, and highlight the need for preventive efforts and professional interventions for snus users who want to quit.

What this paper adds:

- Male adolescents using snus only were at risk of entering young adulthood as dual users of occasional smoking and daily snus use.
- Male adolescents using snus only did not carry an increased risk of smoking only in young adulthood.
- Male adolescent dual users carried high risk of entering adulthood as dual users, daily smokers or daily snus users.

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Competing interests None.

Ethics approval The protocols from both baseline and follow-up were evaluated by the Regional Committee for Medical Research Ethics and approved by the Norwegian Data Inspectorate. Approval from the school authorities was obtained from the school part of the study.

Contributors LG had the main responsibility for the conduct of this study, and all authors made a substantial contribution to the design and the discussion of the results. LG and LF were responsible for the statistical analyses.

Provenance and peer review Not commissioned; externally peer reviewed.

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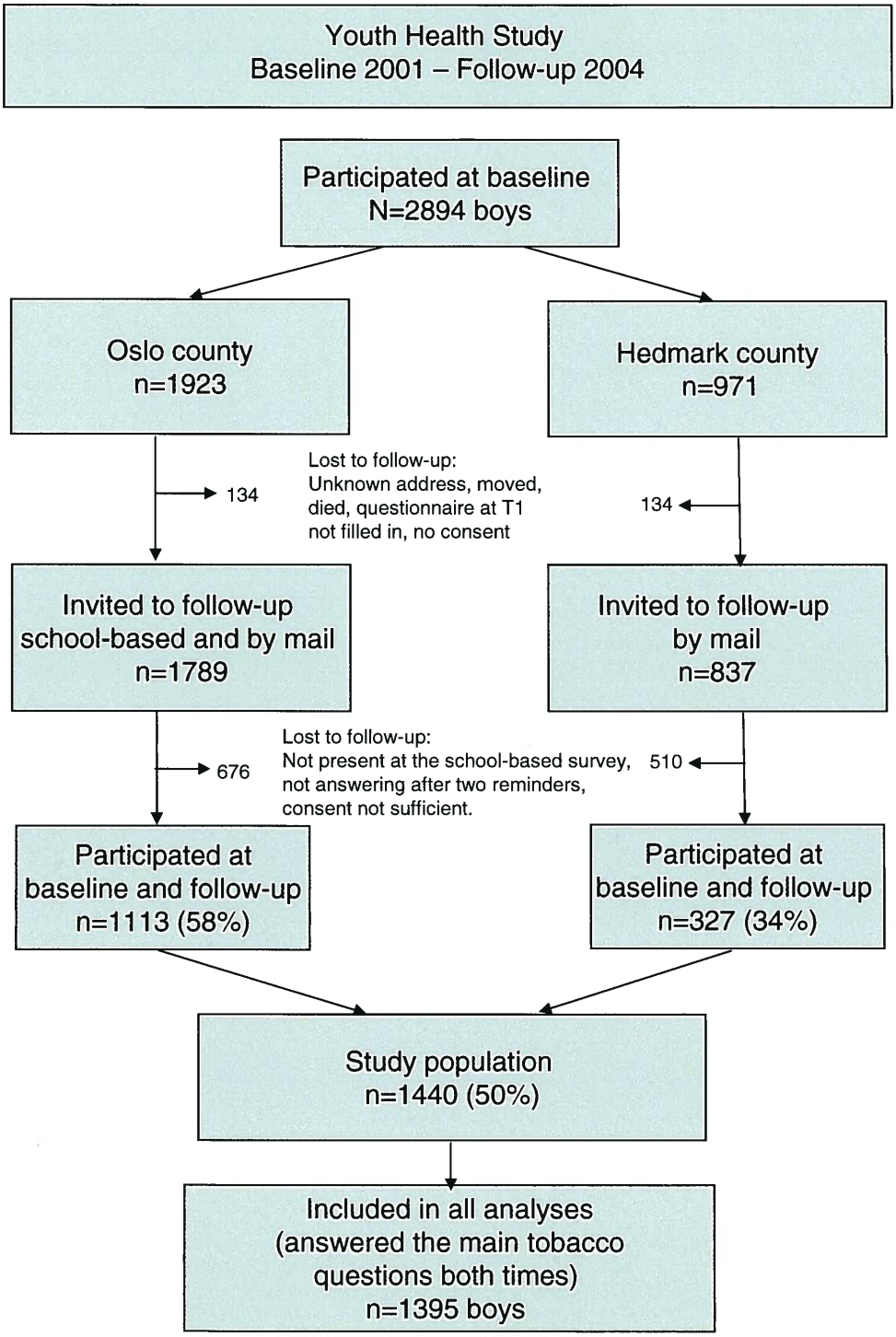
FIG. 1


Youth Health Study
Baseline 2001 – Follow-up 2004
Participated at baseline
N=2894 boys
Oslo county
n=1923
Hedmark county
n=971
134
Lost to follow-up:
Unknown address, moved,
died, questionnaire at T1
not filled in, no consent
134
Invited to follow-up
school-based and by mail
n=1789
Invited to follow-up
by mail
n=837
676
Lost to follow-up:
Not present at the school-based survey,
not answering after two reminders,
consent not sufficient.
510
Participated at
baseline and follow-up
n=1113 (58%)
Participated at
baseline and follow-up
n=327 (34%)
Study population
n=1440 (50%)
Included in all analyses
(answered the main tobacco
questions both times)
n=1395 boys

APPENDIX 1

INFORMED CONSENTS IN THE YOUTH STUDIES

Lim inn etikett med navn og personnummer

SAMTYKKEERKLÆRING
for deltakelse i Helseundersøkelsen i Oslo

UNGDOM

Jeg har mottatt informasjon om ungdomsdelen av Helseundersøkelsen i Oslo. Jeg er informert om formålet med undersøkelsen. Jeg er også kjent med at opplysninger om meg blir behandlet strengt fortrolig og at undersøkelsen er godkjent av Datatilsynet. Undersøkelsen er forelagt Den regionale komité for medisinsk forskningsetikk. Jeg er videre kjent med at det ikke er satt noen spesiell tidsbegrensning for hvor lenge opplysningene om meg kan lagres. Jeg kan på et senere tidspunkt be om å bli slettet fra registeret uten å oppgi noen grunn.
Dette må i så fall sendes skriftlig til Statens helseundersøkelser.

1. **Jeg samtykker i at svarene mine kan brukes til planlegging og forskning.**
2. **Jeg samtykker i at jeg på et senere tidspunkt kan bli kontaktet og få tilbud om å være med i nye undersøkelser.**
3. **Jeg samtykker i at dataene, etter godkjenning fra Datatilsynet, kan kobles med opplysninger om meg i andre registre. Dette kan for eksempel være andre helse-, trygde- eller sykdomsregistre, eller data fra for eksempel folketellinger.**

Du kan stryke det eller de punkter som du vil reservere deg mot.

Elevens underskrift

Dato

← Lim inn etikett nr. 2 (med navn og løpenr.) her!

SAMTYKKEERKLÆRING

for å delta i Helseundersøkelsen av ungdom i Oslo UNGDOM 2004

Jeg har mottatt informasjon om Helseundersøkelsen av ungdom - UNGDOM 2004, som er en del av Landsomfattende helseundersøkelse i Norge.
Jeg er informert om **formålet** med undersøkelsen og at:

- opplysninger om meg blir behandlet strengt fortrolig
- undersøkelsen er godkjent av Datatilsynet og forelagt Den regionale komité for medisinsk forskningsetikk
- ingen forskere vil få tilgang til opplysninger som direkte kan tilbakeføres til meg
- børsteprøver og spørreskjema lagres nedlåst ved Nasjonalt folkehelseinstitutt
- det ikke er satt noen spesiell tidsbegrensning for hvor lenge opplysningene om meg kan lagres
- jeg på et senere tidspunkt kan be om å bli slettet fra registeret og/eller at børsteprøven destrueres uten å oppgi noen grunn, ved å sende skriftlig henvendelse til: Nasjonalt folkehelseinstitutt, Postboks 4404, Nydalen, 0403 Oslo.

Erklæringen nedenfor er avgitt innenfor rammene av informasjon jeg har mottatt om helseundersøkelsen.

ERKLÆRING

1. **Jeg vil delta i spørreskjemaundersøkelsen og samtykker til at data kan benyttes til planlegging og forskning nå og i fremtiden.**
2. **Jeg vil avgi børsteprøve og samtykker til at data kan benyttes til forskning, herunder analyser av arvemateriale og sammenheng med sykdom og helseplager nå og i fremtiden.**
3. **Jeg samtykker til at jeg på et senere tidspunkt kan bli kontaktet og få tilbud om å være med i nye undersøkelser.**
4. **Jeg samtykker til at dataene etter godkjenning fra Datatilsynet, kan kobles med opplysninger om meg i andre helseundersøkelser og registre. Dette kan for eksempel være tidligere helseundersøkelser, helse-, trygde- eller sykdomsregistre, eller data fra folketellinger.**

Jeg samtykker i punktene ovenfor.

Jeg samtykker <u>ikke</u> til følgende punkter:.....

Dette eksemplaret <u>underskrives og returneres</u> sammen med spørreskjema/ børsteprøver. Kopi av samtykkeerklæringen har du fått i informasjonsbrosjyren. Du kan også få en ekstra kopi etter undersøkelsen. Den returnerte samtykkeerklæringen vil bli oppbevart på et nedlåst sted atskilt fra spørreskjema/børsteprøver slik at forskere ikke vil ha adgang til opplysninger som kan identifisere deg som person.

_____ _____

Dato ***Underskrift***

APPENDIX 2

QUESTIONNAIRE:
SURVEY ABOUT LIFE AND HEALTH IN AKERSHUS COUNTY IN 1998

Undersøkelse om liv og helse i Akershus.

Stiftelse for helsetjenesteforskning gjennomfører undersøkelsen.

Skjemaet skal maskinleses og opplysningene behandles anonymt. Det er best om man bruker blå eller svart penn og krysser av omtrent midt i ruta, slik: ☒
Noen spørsmål er annerledes. Det gjelder f.eks. høyde og vekt. Fyll ut slik
168 cm 72 kg (hvis du er 168 cm høy og veier 72 kg).

Noen bakgrunnsopplysninger

1. Hva er din sivilstand?

☐ Gift/ reg. partner ☐ Samboende ☐ Enslig
☐ Enke/ enkemann ☐ Separert ☐ Skilt

2. a) Hvor høy er du, uten sko? ____ cm

b) Hvor mye veier du, uten klær og sko?
(Hvis du er gravid, oppgi vekt før graviditet). ____ kg

3. a) Hvor lenge har du bodd i den kommunen du bor nå?

☐ Under 1 år
☐ 1-2 år
☐ 3-5 år
☐ 6-10 år
☐ 11 år eller mer

b) Hvor er du vokst opp?

☐ I den kommunen jeg bor nå
☐ I annen kommune i Akershus
☐ I et annet land
☐ Jeg er vokst opp flere steder
☐ I Oslo
☐ I et annet nabofylke
☐ I et annet fylke

4. Passer noen av disse beskrivelsene for deg?
Sett kryss i én av rutene.

☐ Yrkesaktiv
☐ Skoleelev/ student /praktikant
☐ Arbeidsledig/ permittert fra arbeid
☐ Mottaker av sosialhjelp
☐ Er i militær- eller siviltjeneste
☐ Hjemmeværende/ husmor
☐ Langtidssykemeldt (over 8 uker)
☐ Er på attføring/ medisinsk rehabilitering
☐ Uføretrygdet
☐ Alderspensjonist/ annen pensjonist
☐ Nei, ingen av beskrivelsene passer for meg

5. Har du noen kronisk (langvarig) sykdom, funksjonshemming eller skade?
(f.eks. astma, epilepsi, diabetes, c.p., hørselsnedsettelse o.l.). ☐ Ja, en ☐ Ja, flere ☐ Nei

Hvis ja, nevn den ene eller den viktigste (alvorligste, mest plagsomme eller bekymringsfulle sykdommen, funksjonshemmingen eller skaden)
Bruk blokkbokstaver: .....

De neste spørsmålene handler om hvordan du ser på din egen helse. Svarene vil gi et inntrykk av hvordan du har det og hvordan du er i stand til å utføre dine daglige gjøremål.

6. Stort sett, vil du si at din helse er?

Utmerket	Meget god	God	Nokså god	Dårlig
☐	☐	☐	☐	☐

7. Sammenlignet med for ett år siden, hvordan vil du si at din helse stort sett er nå?

Mye bedre nå enn for ett år siden	Litt bedre nå enn for ett år siden	Omtrent den samme som for ett år siden	Litt dårligere nå enn for ett år siden	Mye dårligere nå enn for ett år siden
☐	☐	☐	☐	☐

8. Dette spørsmålet handler om aktiviteter som du kanskje utfører i løpet av en vanlig dag. Er din helse slik at den begrenser deg i utførelsen av disse aktivitetene nå? Hvis ja, hvor mye?

AKTIVITETER	Ja, begrenser meg mye	Ja, begrenser meg litt	Nei, begrenser meg ikke i det hele tatt
Anstrengende aktiviteter, som å løpe, løfte tunge gjenstander, delta i anstrengende idrett	☐	☐	☐
Moderate aktiviteter, som å flytte et bord, støvsuge, gå en tur eller drive med hagearbeid	☐	☐	☐
Løfte eller bære en handlekurv	☐	☐	☐
Gå opp trapper flere etasjer	☐	☐	☐
Gå opp trapper en etasje	☐	☐	☐
Bøye deg eller sitte på huk	☐	☐	☐
Gå mer enn to kilometer	☐	☐	☐
Gå noen hundre meter	☐	☐	☐
Gå hundre meter	☐	☐	☐
Vaske deg eller kle på deg	☐	☐	☐

9. I løpet av de siste 4 ukene, har du hatt noen av følgende problemer i ditt arbeid eller i andre av dine daglige gjøremål på grunn av din fysiske helse?

	Ja	Nei
Du har måttet **redusere tiden** du har brukt på arbeid eller på andre gjøremål.	☐	☐
Du har **utrettet mindre** enn du hadde ønsket.	☐	☐
Du har vært hindret i å utføre **visse typer** arbeid eller gjøremål.	☐	☐
Du har hatt **problemer** med å gjennomføre arbeidet eller andre gjøremål (f.eks. fordi det krevde ekstra anstrengelser).	☐	☐

10. I løpet av de siste 4 ukene, har du hatt noen av de følgende problemer i ditt arbeid eller i andre av dine daglige gjøremål på grunn av følelsesmessige problemer (som f. eks. å være deprimert eller engstelig)?

	Ja	Nei
Du har måttet **redusere tiden** du har brukt på arbeid eller på andre gjøremål	☐	☐
Du har **utrettet mindre** enn du hadde ønsket	☐	☐
Du har utført arbeidet eller andre gjøremål mindre **grundig** enn vanlig	☐	☐

11. I løpet av de siste 4 ukene, i hvilken grad har din fysiske helse eller følelsesmessige problemer hatt innvirkning på din vanlige sosiale omgang med familie, venner, naboer eller foreninger?

Ikke i det hele tatt	Litt	En del	Mye	Svært mye
☐	☐	☐	☐	☐

12. Hvor sterke kroppslige smerter har du hatt i løpet av de siste 4 ukene?

Ingen	Meget svake	Svake	Moderate	Sterke	Meget sterke
☐	☐	☐	☐	☐	☐

13. I løpet av de siste 4 ukene, hvor mye har smerter påvirket ditt vanlige arbeid (gjelder både arbeid utenfor hjemmet og husarbeid)?

Ikke i det hele tatt	Litt	En del	Mye	Svært mye
☐	☐	☐	☐	☐

14. Dette spørsmålet handler om hvordan du har følt deg og hvordan du har hatt det de siste 4 ukene. For hvert delspørsmål, vennligst velg det svaralternativet som best beskriver hvordan du har hatt det.

Hvor ofte i løpet av de siste 4 ukene har du:	**Hele tiden**	**Nesten hele tiden**	**Mye av tiden**	**Endel av tiden**	**Litt av tiden**	**Ikke i det hele tatt**
Følt deg full av tiltakslyst?	☐	☐	☐	☐	☐	☐
Følt deg veldig nervøs?	☐	☐	☐	☐	☐	☐
Vært så langt nede at ingenting har kunnet muntre deg opp?	☐	☐	☐	☐	☐	☐
Følt deg rolig og harmonisk?	☐	☐	☐	☐	☐	☐
Hatt mye overskudd?	☐	☐	☐	☐	☐	☐
Følt deg nedfor og trist?	☐	☐	☐	☐	☐	☐
Følt deg sliten?	☐	☐	☐	☐	☐	☐
Følt deg glad?	☐	☐	☐	☐	☐	☐
Følt deg trett?	☐	☐	☐	☐	☐	☐

15. I løpet av de siste 4 ukene, hvor mye av tiden har din fysiske helse eller følelsesmessige problemer påvirket din sosiale omgang (som det å besøke venner, slektninger osv.)?

Hele tiden	Nesten hele tiden	En del av tiden	Litt av tiden	Ikke i det hele tatt
☐	☐	☐	☐	☐

16. Hvor RIKTIG eller GAL er hver av de følgende påstander for deg?

	Helt riktig	Delvis riktig	Vet ikke	Delvis gal	Helt gal
Det virker som om jeg blir lettere syk enn andre	☐	☐	☐	☐	☐
Jeg er like frisk som de fleste jeg kjenner	☐	☐	☐	☐	☐
Jeg tror at helsen min vil forverres	☐	☐	☐	☐	☐
Jeg har utmerket helse	☐	☐	☐	☐	☐

Noen spørsmål om livsstil og levevaner

17. Røyker du?

- ☐ Nei, jeg har aldri røykt
- ☐ Nei, jeg har sluttet
- ☐ Ja, jeg røyker pipe el.sigarer av og til
- ☐ Ja, jeg røyker pipe el. sigarer daglig
- ☐ Ja, jeg røyker sigaretter av og til
- ☐ Ja, jeg røyker **sigaretter daglig**

Dagligrøykere av sigaretter fortsetter med spørsmål 18, tidligere dagligrøykere av sigaretter går til spørsmål 21 og ***ALLE ANDRE går til spørsmål 22.***

18. Hvor mange og hva slags sigaretter røyker du daglig?

	Vanlige kjøpe-sigaretter	Sigaretter av rulletobakk	Begge typer sigaretter om hverandre
Mellom 0 og 5 sigaretter	☐	☐	☐
Mellom 5 og 10 sigaretter	☐	☐	☐
Mellom 10 og 20 sigaretter	☐	☐	☐
Mer enn 20 sigaretter	☐	☐	☐

19. Har du noen gang.....

	Ja, en gang	Ja, flere ganger	Nei
-hørt at det finnes røykeavvenningskurs i din kommune?	☐	☐	☐
-fått råd av lege om å slutte å røyke?	☐	☐	☐
-fått tilbud om røykeavvenningskurs?	☐	☐	☐
-deltatt på røykeavvenningskurs?	☐	☐	☐
-forsøkt å slutte å røyke på egen hånd?	☐	☐	☐
-greid å slutte i en periode på minst 6 mnd	☐	☐	☐

20. a) Hvor gammel var du begynte å røyke daglig (første gang)? ☐ **år**

b) Kunne du tenke deg å delta på et røykeavvenningskurs i løpet av de nærmeste 6 måneder? Ja ☐ Nei ☐ Vet ikke ☐

21. Til tidligere dagligrøykere av sigaretter:

a) Hva var de tre viktigste grunnene til at du sluttet å røyke?
Kryss av for maks. 3 grunner.

- ☐ Jeg ville ta vare på egen helse
- ☐ På grunn av egen sykdom
- ☐ Legen rådet meg til det
- ☐ Fordi jeg ble gravid
- ☐ Jeg ville spare penger
- ☐ Jeg mislikte avhengigheten
- ☐ Jeg ville bevare en pen hud
- ☐ Hensyn til barnet/barna i familien
- ☐ Min røyking var til sjenanse for familiemedlemmer
- ☐ Jeg ville komme i bedre fysisk form
- ☐ Min samboer/ektefelle sluttet å røyke
- ☐ En venn/venninne jeg setter pris på sluttet å røyke
- ☐ Jeg mislikte at det luktet røyk av meg
- ☐ Andre ting .....

b) Hvor gammel var du da du sluttet å røyke (siste gang)? ☐ **år**

22. a) Hvordan har din fysiske aktivitet i fritida vært det siste året?
Tenk deg et ukentlig gjennomsnitt for året. Arbeidsvei regnes som fritid.
Sett ett kryss i hver linje.

	Timer pr. uke			
	Ingen	**Under 1 t.**	**1-2 t.**	**3 og fler**
Lett aktivitet (ikke svett/andpusten)	☐	☐	☐	☐
Hard fysisk aktivitet (svett/andpusten)	☐	☐	☐	☐

b) Drev du regelmessig med noen form for idrett i oppveksten? ☐ Ja ☐ Nei

23. Hvor ofte mosjonerer eller trener du vanligvis?

- ☐ Aldri
- ☐ Sjeldnere enn 1 dag pr. uke
- ☐ 1 dag pr. uke
- ☐ 2-3 dager pr. uke
- ☐ 4-7 dager pr. uke

24. Har du brukt noen av følgende medisiner den siste måneden?

	Daglig	**Hver uke, men ikke hver dag**	**Sjeldnere enn hver uke**	**Nei**
Beroligende medisin eller sovemedisin?	☐	☐	☐	☐
Medisin mot depresjon?	☐	☐	☐	☐

25. Hvor ofte bruker du disse matvarene? Tenk på dine matvaner det siste året.
Sett kryss i de rutene som beskriver ditt forbruk best.

	Flere g. daglig	Daglig	1-6 g. pr. uke	1-3 g. pr. mnd.	Sjelden eller aldri
Fisk (middag/pålegg)	☐	☐	☐	☐	☐
Frukt	☐	☐	☐	☐	☐
Grønnsaker	☐	☐	☐	☐	☐
Helmelk, kefir, youghurt	☐	☐	☐	☐	☐
Lettmelk, lettyoughurt	☐	☐	☐	☐	☐
Skummet melk (sur/søt)	☐	☐	☐	☐	☐

26. Hva slags smør eller margarin bruker du vanligvis på brødet?
Sett kryss i den ruta som passer best.

☐ Bruker ikke smør/margarin
☐ Smør/ margarinblanding
☐ Meierismør / hard margarin
☐ Lettmargarin/ bløt margarin

27. Hvor mange glass drikker du vanligvis av følgende i løpet av en uke?
Tenk deg et gjennomsnitt for året. *Sett kryss for alle drikkene.*

	Bruker ikke	Færre enn ett	1-2	3-4	5-6	7-8	9-10	11+
Appelsinjuice, glass	☐	☐	☐	☐	☐	☐	☐	☐
Sukkerholdig leskedrikk (brus, saft)	☐	☐	☐	☐	☐	☐	☐	☐
Kunstig søtet leskedrikk (light brus, saft)	☐	☐	☐	☐	☐	☐	☐	☐
Øl, glass	☐	☐	☐	☐	☐	☐	☐	☐
Rødvin, glass	☐	☐	☐	☐	☐	☐	☐	☐
Hvitvin, glass	☐	☐	☐	☐	☐	☐	☐	☐
Brennevin, likør o.l., dram	☐	☐	☐	☐	☐	☐	☐	☐

28. Har husholdningen noen form for kjæledyr?

☐ Ja, hund
☐ Ja, katt
☐ Ja, annet pelsdyr
☐ Ja, annet kjæledyr (fugl, fisk, m.m.)
☐ Har vanligvis dyr, men ikke akkurat nå
☐ Nei

Yrkesaktive fortsetter med spørsmål 29, ALLE ANDRE går til spørsmål 33:

29. Hvor lang tid bruker du på å komme til og fra arbeid hver dag?
Regn med reisetiden begge veier sammenlagt..

☐ Mindre enn 1 time
☐ Mellom 1 og 2 timer
☐ Mellom 2 og 4 timer
☐ Mer enn 4 timer
☐ Jeg ukependler og reiser bare hjem i helgene
☐ Jeg arbeider på oljeplattform, off-shore eller tilsvarende

30. a) Alt i alt, hvor tilfreds er du med jobben din?

- ☐ Svært tilfreds
- ☐ Ganske tilfreds
- ☐ Verken tilfreds eller utilfreds
- ☐ Ganske utilfreds
- ☐ Svært utilfreds

b) Hvor mye og hvordan arbeider du?
Sett kryss i den ruta som passer best.

- ☐ Heltid
- ☐ Deltid
- ☐ Som selvstendig næringsdrivende
- ☐ Komb. heltid og selvstendig næringsdriv.
- ☐ Komb. deltid og selvstendig næringsdriv.

31. Hvis du er yrkesaktiv: hvordan vil du beskrive arbeidet ditt?
Sett kun ett kryss.

- For det meste stillesittende arbeid ☐ *(f.eks. skrivebordsarbeid, montering)*
- Arbeid som krever at du går mye ☐ *(f.eks. ekspeditørarb., lett industriarb., undervisning)*
- Arbeid hvor du går og løfter mye ☐ *(f.eks. postbud, pleier, bygningsarbeid)*
- Tungt kroppsarbeid ☐ *(f.eks. skogsarbeid, tungt jordbruksarb., tungt bygningsarb)*

32. Hender det at du er så sliten etter dagens arbeid at du har vanskelig for å ta deg til noe, f.eks. å mosjonere, utøve en hobby, treffe venner etc.?

- ☐ Nei, nesten aldri
- ☐ Nei, sjelden
- ☐ Iblant
- ☐ Ja, ganske ofte
- ☐ Ja, som oftest

33. Hvor mange personer har du som du kan snakke helt fortrolig med?

☐ Ingen ☐ Én ☐ Flere

34. Hvis du selv ble syk og måtte holde sengen over lengre tid, hvor sannsynlig er det at du får nødvendig hjelp av familie, venner eller naboer?

	Svært sannsynlig	Sannsynlig	Kanskje	Usann-synlig	Helt usannsynlig
Familie	☐	☐	☐	☐	☐
Venner	☐	☐	☐	☐	☐
Naboer	☐	☐	☐	☐	☐

35. Hender det at du føler deg ensom?

- ☐ Ja, ofte
- ☐ Ja, av og til
- ☐ Nei, sjelden
- ☐ Nei, aldri

På neste og siste side spør vi om ditt forhold til helsetjenester og til andre ytelser fra kommunen

36. a) Har du hatt kontakt med lege siste år?

Nei	Ja, 1-2 ganger	Ja, 3-5 ganger	Ja, 5-10 ganger	Mer enn 10 ganger
☐	☐	☐	☐	☐

b) Bruker du en fast lege? ☐ Ja ☐ Nei

37. Benyttet du noen av følgende helsetjenester siste år? *Flere kryss mulig.*

- ☐ Legevakt
- ☐ Sykehus
- ☐ Psykiater/ psykolog
- ☐ Hjemmesykepleie
- ☐ Kiropraktor
- ☐ Fotsoneterapi
- ☐ Poliklinikk
- ☐ Tannlege
- ☐ Fysioterapeut
- ☐ Hjemmehjelp
- ☐ Naturmedisin/ homøopati
- ☐ Akupunktur
- ☐ Nei, ingen

38. Hvilke tre områder har etter din mening størst behov for økt innsats i din kommune? Vi tenker på tiltak som kan forbedre helse og forebygge sykdom og skade.
Kryss av for de tre viktigste områdene.

- ☐ Støy i bomiljøet
- ☐ Luftkvalitet i bomiljøet
- ☐ Mosjonsgrupper/ treningstilbud
- ☐ Vold og kriminalitet
- ☐ Grupper og aktiviteter for eldre
- ☐ Ungdom og alkohol/tobakk
- ☐ Ungdom og narkotiske stoffer
- ☐ Arbeidsmarkedstiltak/ sikre jobber til alle
- ☐ Kostholdsinformasjon
- ☐ Trafikksikkerhet
- ☐ Hjelp for personer med psykiske lidelser
- ☐ Ungdomsklubber el.l
- ☐ Annet.....
- ☐ Vet ikke

39. Hvilke tre tjenestetilbud innen helse- og sosialomsorg er det viktigst å forbedre/ opprette i din kommune? *Kryss av for de tre viktigste tilbudene.*

- ☐ Psykolog /psykiater
- ☐ Legevakt
- ☐ Allmennleger
- ☐ Hjemmehjelp til eldre og uføre
- ☐ Hjemmesykepleie til eldre og uføre
- ☐ Sykehjemstilbud
- ☐ Tilbud til aldersdemente og deres pårørende
- ☐ Rehabilitering etter slag, lårhalsbrudd etc.
- ☐ Helsestasjon for ungdom
- ☐ Svangerskapsomsorg
- ☐ Skolehelsetjeneste
- ☐ Helsestasjon for spedbarn/småbarn
- ☐ Trygdeboliger
- ☐ Tilbud til psykisk utviklingshemmede
- ☐ Tiltak mot rusmiddelmisbruk
- ☐ Annet.....
- ☐ Vet ikke

TAKK FOR AT DU TOK DEG TID TIL Å SVARE!

APPENDIX 3

QUESTIONNAIRE:
YOUTH SURVEYS IN SIX COUNTIES 2000-2004, EXEMPLIFIED BY THE OSLO HEALTH SURVEY AMONG 10TH GRADE PUPILS

THE OSLO HEALTH STUDY U

Date filled in:
Day Month Year

Do not write here: *1.3 (skade)* *4.8 (rusmidler)* *8.1 (utdanning - annet)* *9.5 (far - født)* *9.6 (mor - født)*

9.7 (far - yrke) *9.7 (mor - yrke)* *12.5 (prevensjon)*

12.6 (p-pille merke)

U1. OWN HEALTH

1.1 What is your present state of health? *(One cross only!)*

Poor	Not so good	Good	Very good
☐ 1	☐ 2	☐ 3	☐ 4

1.2 Have you, or have you had? *(Cross off for each line)*

	YES	NO
Asthma	☐	☐
Hay fever (pollen allergy allergic reaction, running nose, smarting eyes	☐	☐
Eczema	☐	☐
Diabetes	☐	☐

1.3 Have you had <u>during the last 12 months</u> *(Cross off for each line)*

Inflamed ear	☐	☐
Sore (inflamed) throat (At least 3 times)	☐	☐
Bronchitis or pneumonia	☐	☐
Mental disorder for which for you sought help	☐	☐
Serious injury or illness	☐	☐

If you answered "YES"; what kind of serious injury or illness was it:

_____

1.4 Do you have the following functional disability, *(Cross off for each line)*

	No	Yes, a little	Yes a lot
Impaired mobility	☐	☐	☐
Impaired vision	☐	☐	☐
Impaired hearing	☐	☐	☐

1.5 Have you, <u>in the course of the last 12 months</u>, been troubled several times by pain in: *(Cross off for each line)*

	YES	NO
Head (headache, migraine etc.)	☐	☐
Neck/shoulder	☐	☐
Arms/legs/knees	☐	☐
Stomach	☐	☐
Back	☐	☐

If you answered "NO" to all the questions under 1.5: Go straight to U2 (next page)

1.6 Did <u>this pain</u> cause you to stay home from school?

State also the approx. number of school days lost during the last 12 months:
(One cross only!)

No	Yes, 1-2 days	Yes, 3-5 days	Yes, 6-10 days	Yes, more then 10 days
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	YES	NO
1.7 Did the pain lead to reduced activity in your spare time?	☐	☐

U2. DENTAL HEALTH

2.1 Do you think that you have better or poorer teeth than other young people of your age? *(One cross only!)*

Better	Same as most	Poorer	Do not know
☐ 1	☐ 2	☐ 3	☐ 4

2.2 Do you care about having good teeth? *(One cross only!)*

Yes, a lot ☐ 1 **Yes, a little** ☐ 2 **No** ☐ 3

2.3 How often do you brush your teeth? *(One cross only!))*

Several times a day	Once a day	Every other day	Less than every other day
☐ 1	☐ 2	☐ 3	☐ 4

2.4 Have you had toothache due to a rotten tooth (cares)? *(Cross off more than one alternative if applicable)*

Yes, but before I started school	Yes, after I started school	No, never	Do not know
☐ 1	☐ 2	☐ 3	☐ 4

U3. EXERCISE AND PHYSICAL ACTIVITY

3.1 Out of school hours: How many <u>times per week</u> do you take part in sport/do physical exercise to an extent that you feel out of breath or sweat? ☐☐ *times per week*

3.2 About how many hours per week do you spend on this activit

0 hours	1-2 hours	3-4 hours	5-7 hours	8-10 hours	11 hours or more
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

	YES	NO
3.3 Do you take part in competitive sport? *(Individually or as part of a team)*	☐	☐

3.4 Do you use the countryside (woods and fields) for walking?

	Never	Yes, but less than once a month	Yes, once a month or more
Summer:	☐ 1	☐ 2	☐ 3
Winter:	☐ 1	☐ 2	☐ 3

3.5 Outside school hours: How many hours <u>per school day</u> *(Monday to Friday)* **do you sit, on average, in front of a TV, video and/or PC (games and Internet)?**

Up to 1 hour	1-2 hours	3-5 hours	More than 5 hours
☐ 1	☐ 2	☐ 3	☐ 4

3.6 How do you usually get <u>to school</u> during the summer half-year? *(One cross only!)*

By bus/train etc.. *(public transport)* ..... ☐ 1

By car/scooter..... ☐ 2

By bicycle..... ☐ 3

On foot..... ☐ 4

3.7 How far do you live from school?

Less than 2 km	2-4 km	More than 4 km
☐ 1	☐ 2	☐ 3

U4. SMOKING, INTOXICANTS AND DOPE

4.1 Do you smoke, or have you smoked earlier? *(One cross only!)*

No, never	Yes, but I have stopped	Yes, at times	Yes, daily
☐ 1	☐ 2	☐ 3	☐ 4

If you answered "NO, NEVER", go straight to item 4.3.

4.2 How old were you when you started to smoke? ☐☐ yrs

4.3 Do you use or have you used smokeless tobacco (snuff, chewing tobacco or similar)? *(One cross only!)*

No, never	Yes, but I have stopped	Yes, at times	Yes, daily
☐ 1	☐ 2	☐ 3	☐ 4

4.4 Do any of the people you live with smoke?
(Put one or more crosses, as applicable)

Yes, mother	Yes, father	Yes/sibling (brother/sister)	Yes, other	No
☐	☐	☐	☐	☐

	Yes	No
4.5 Have you ever drunk alcohol?	☐	☐

(E.g. alcoholic beer, alco-pop, wine, spirits or "hooch" (home-distilled liquor)

If you answered "NO", go straight to item 4.8.

4.6 Have you every drunk so much alcohol that you got drunk? *(One cross only!)*

No, never	Yes once	Yes 2--3 times	Yes 4-10 times	Yes, more than 10 times
☐	☐	☐	☐	☐

4.7 About how often in the course of the past year have you drunk alcohol? *(One cross only!)*
(Low-alcohol beer and non-alcoholic beer do not count)

4-7 times a week	2-3 times a week	ca. once a week	2-3 times a month	About once a month
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

A few times in the past year	Have not drunk alcohol during the past year	Have never drunk alcohol
☐ 6	☐ 7	☐ 8

4.8 Have you ever tried doping agents? *(One cross only!)*

No never	Yes, once	Yes, several times	Yes, I use one regularly
☐ 1	☐ 2	☐ 3	☐ 4

U5. FOOD, DRINK AND EATING HABITS

5.1 How often do you normally eat these foods?
(Cross off for each line)

	Seldom/ never	1-3 t pr.mth	1-3 t. pr.wk	4-6 t. pr.wk	1-2 t. pr. day	3 t. or more pr. day
Fruit, berries.....	☐	☐	☐	☐	☐	☐
Cheese (all kinds).....	☐	☐	☐	☐	☐	☐
Potatoes	☐	☐	☐	☐	☐	☐
Cooked vegetables	☐	☐	☐	☐	☐	☐
Raw vegetables/salad.....	☐	☐	☐	☐	☐	☐
Oily fish (*e.g. salmon*.....	☐	☐	☐	☐	☐	☐
trout, macherel, herring)						
Chocolates/sweets.....	☐	☐	☐	☐	☐	☐
Potato chips etc.....	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6

5.2 How much do you normally drink of the following?
(Cross off for each line)
(1/2 liter = 3 glasses

	Seldom/ never	1-6 glasses pr.week	1 glass pr.day	2-3 glasses pr. day	4 glasses or more pr. day
Full-cream milk, kefir, yoghurt	☐	☐	☐	☐	☐
Semi-skimmed milk, "Cultura", low-fat yoghurt	☐	☐	☐	☐	☐
Skimmed milk (sour/sweet).....	☐	☐	☐	☐	☐
Cola/"fizzy" drinks, with sugar	☐	☐	☐	☐	☐
Cola/"fizzy" drinks, without sugar.....	☐	☐	☐	☐	☐
Fruit juice	☐	☐	☐	☐	☐
Diluted fruit juice.....	☐	☐	☐	☐	☐
Water	☐	☐	☐	☐	☐
	1	2	3	4	5

5.3 What kind of fat do you most often use on your bread?
(One cross only!)

Butter/hard margarine	Soft/light margarine	Oils	Do not use fat on bread
☐ 1	☐ 2	☐ 3	☐ 4

5.4 How often do you eat the following meals in an ordinary week?
(Cross off for each line)

	Seldom/ never	1-2 times pr.wk	3-4 times pr. wk	5-6 times pr. wk	Daily
Breakfast	☐	☐	☐	☐	☐
Lunch/packed lunch	☐	☐	☐	☐	☐
Dinner	☐	☐	☐	☐	☐
	1	2	3	4	5

5.5 How much money do you spend <u>per week on</u> "goodies", snacks, Coke/"fizzy" drinks and fast food? *(One cross only!)*

0-25 kr.	26-50 kr.	51-100 kr.	101-150 kr.	151-200 kr.	more than 200 kr.
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

5.6 Do you take the following food supplements?

	Yes, daily	Sometimes	No
Cod liver oil, cod liver oil capsules, fish oil capsules?	☐	☐	☐
Vitamin- and/or mineral supplement?	☐	☐	☐

5.7 Have you ever tried to slim? *(One cross only!)*

No, never	Yes, earlier on	Yes, now	Yes, all the time
☐ 1	☐ 2	☐ 3	☐ 4

If you answered "NO, NEVER", go straight to item 5.9.

5.8 What have you done in order to lose weight?
(Cross off for each line)

	Never	Seldom	Often	Always
I eat less	☐	☐	☐	☐
I fast	☐	☐	☐	☐

I exercise more.....	☐	☐	☐	☐
I vomit	☐	☐	☐	☐
I use laxatives or diuretics…….....	☐	☐	☐	☐
I take "filling" or hunger-reducing pills.....	☐	☐	☐	☐
	1	2	3	4

5.9 What did you weigh when you weighed yourself last? ☐☐☐ *whole kg*

5.10 What was your height when you measured it last? ☐☐☐ *whole cm*

5.11 What do you think about your weight? *(One cross only!)*

Weight is OK	Weigh a bit too much	Weigh far too much	Weigh not quite enough	Weigh far too too little
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5.12 I care a lot about my weight. *(One cross only!)*

Agree ☐ Tend to agree ☐ Do not agree ☐

5.13 What weight would you be satisfied with at present (the weight that would please you)? ☐☐☐ *whole kg*

5.14 Have you been treated for eating disorders? *(One cross only!)*

No	No, but I should like help	Yes
☐ 1	☐ 2	☐ 3

U6. STRESSES AND COPING

6.1 Below is a list of various problems. Have you been troubled by any of these <u>in the course of the past week</u> (including today)?
(Cross off for each line)

	Not troubled	Slightly troubled	Much troubled	Very much troubled
Sudden feeling of fear for no reason.....	☐	☐	☐	☐
Feel afraid or anxious……..	☐	☐	☐	☐
Feel faint or dizzy……	☐	☐	☐	☐
Feel tense or harassed.....……..	☐	☐	☐	☐
Feel guilty (easily blame yourself)	☐	☐	☐	☐
Sleeplessness .....……	☐	☐	☐	☐
Feel depressed, dejected (sad).....…	☐	☐	☐	☐
Feel useless, of little worth……	☐	☐	☐	☐
Feel that everything is a burden	☐	☐	☐	☐
Feeling of hopelessness for the future	☐	☐	☐	☐
	1	2	3	4

6.2 Below are some statements:
(Cross off for each line)

	Completely wrong	Fairly wrong	Fairly correct	Completely correct
I always manage to solve serious problems if I try hard enough.....……..	☐	☐	☐	☐
If someone opposes me, I manage to find ways and means of getting what I want	☐	☐	☐	☐
If I have a problem and and are completely stuck I usually manage to find a way out.....	☐	☐	☐	☐
I am quite sure that I would be able to tackle unexpected occurrences in an effective manner.....….....	☐	☐	☐	☐
I stay calm when I meet difficulties because I trust in my ability to cope/to succeed……....	☐	☐	☐	☐
	1	2	3	4

6.3 Have you in the course of <u>the last 12 months</u> experienced any of the following?
(Cross off for each line)

	YES	NO
A parent (supporter) has become unemployed or qualified for disability pension.....……	☐	☐
	☐	☐

You, yourself, have been seriously ill or injured.....……

Someone you are close to has been seriously ill or injured.....……

Someone close to you has died.....……..…….

Sexual violation *(e.g. indecent exposure, pawing, unwilling sexual intercourse etc.)*……..

6.4 Have you experienced any of the following: *(Cross off for each line)*

	No	Yes, at times	Yes, often
Heavy pressure of work at school.....	☐	☐	☐
Heavy pressure from others to succeed/ to do well at school	☐	☐	☐
Find it very difficult to concentrate in class	☐	☐	☐
Find it very difficult to understand the teacher when he/she is teaching.....	☐	☐	☐

6.5 Has a professional said that you have or have had reading or writing difficulties? *(One cross only!)*

Yes, major	Yes, moderate	Yes, slight	No
☐ 1	☐ 2	☐ 3	☐ 4

6.6 Have you, in the course of <u>the last 12 months</u> experienced bullying at school / on the way to school? *(One cross only!)*

Never	Sometimes	About once a week	Several times a week
☐ 1	☐ 2	☐ 3	☐ 4

U7. USE OF THE HEALTH SERVICES

7.1 Have you yourself used any of the following services in the <u>past 12 months</u> :

(Cross off for each line)	Never	1-3 times	4 times or more
Schools Health Service.....	☐	☐	☐
Youth Health clinic	☐	☐	☐
Ordinary doctor (General Practitioner).....	☐	☐	☐
Educational/Psychological Service.....	☐	☐	☐
Psychologist or psychiatrist..... *(private or at an outpatient clinic)*	☐	☐	☐
Family counselling.....	☐	☐	☐
Other consultant (specialist) (*private or at an outpatient clinic)*…..	☐	☐	☐
Emergency service (“doctor on call”) *(private or public)*……	☐	☐	☐
Admission to hospital.....	☐	☐	☐
Municipal social welfare services.....	☐	☐	☐
Physiotherapist.....	☐	☐	☐
Dentist/school dentist.....	☐	☐	☐
Alternative therapist.....	☐	☐	☐

U8. EDUCATION AND PLANS FOR FURTHER EDUCATION

8.1 What is the <u>highest education</u> you have considered? *(One cross only)*

University or regional college education of <u>higher degree</u>..... ☐ 1
(e.g. degreed teacher, lawyer, graduate engineer, dentist, doctor, psychologist, graduate economist)

University or regional college education at <u>intermediate level</u>..... ☐ 2
(e.g. cand.mag., teacher, social worker, nurse, policeman/ woman. engineer, journalist)

Upper secondary school education in general, economic and administrative subjects .. ☐ 3

Vocational education at upper secondary school..... ☐ 4
(cook, hairdresser, building and construction subjects, electrician, health and social subjects etc.)

One year's education at upper secondary school ..... ☐ 5

Other: _____ ☐ 6

Have not decided ..... ☐ 7

8.2 How much of your own money have you used in the course of the last week? kr ☐☐☐☐☐

(Small purchases plus larger items such as Hi-Fi system etc..)

YES NO

8.3 Do you have paid work in the course of the school year? ..... ☐ ☐

If you answered "YES":

How many hours per week do you work? *ca.* ☐☐ *whole hours*

How much do you earn on average per month for this work?..... *kr* ☐☐☐☐☐

8.4 What grade did you get last time in your school record book? *(Write only whole grades)*

Maths	Norwegian written	English	Social studies
☐	☐	☐	☐

U9. WHERE YOU GREW UP / WHERE YOU BELONG

9.1 How long have you lived in Norway? ☐☐ *whole yrs*

9.2 How long have you lived where you live now ? ☐☐ *whole yrs*

9.3 Have you moved in the course of the last 5 years? *(One cross only!)*

No	Yes, once	Yes, 2-4 times	Yes, 5 times or more
☐ 1	☐ 2	☐ 3	☐ 4

9.4 My parents are: *(One cross only!)*

Married/partners	Unmarried	Divorced/separated	One or both are dead	Other
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

9.5 Where were your parents born?

	Norway	Another country	Which country:
Father:	☐	☐	Father_____
Mother:	☐	☐	Mother_____

9.6 I think that our family, seen in relation to other families in Norway, has: *(One cross only!)*

Poor economy	Moderate economy	Good economy	Very good economy
☐ 1	☐ 2	☐ 3	☐ 4

9.7 Do your father and / or mother have paid employment at present?

	Yes, full time	Yes, part time	Unemployed/ disability pens.	At home	Attending school/ studying	Dead
Father:	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
Mother:	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6

If your father and/or your mother has paid employment, what is his/her occupation?

Father:_____

Describe briefly what he does at work:

_____

Mother: _____

Describe briefly what she does at work:

_____

U10. FAMILY AND FRIENDS

10.1 Who do you live together with at present? *(One cross only!)*

(*Do not include brother and sisters, or half-brothers/sisters.)*

Mother and father	Mother only	Father only	About the same time with mother and father

☐ 1 ☐ 2 ☐ 3 ☐ 4

Mother or father and new partner or husband/wife **Foster parents** **Other**

☐ 5 ☐ 6 ☐ 7

10.2 How many brothers and sisters or half-brothers/sisters (siblings) do you <u>live</u> together with?..... *Number siblings* ☐☐

10.3 How many of these are the same age or older than you? .... *Number siblings* ☐☐

10.4 When you think about your family, would you say that:

(Cross off for each line)	**Completely agree**	**Partly agree**	**Partly disagree**	**Completely disagree**
I feel attached to my family……	☐	☐	☐	☐
My family takes me seriously.....	☐	☐	☐	☐
My family values my opinions	☐	☐	☐	☐
I mean a lot to my family.....	☐	☐	☐	☐
I can count on my family when I need help.....	☐ 1	☐ 2	☐ 3	☐ 4

10.5 What kind of relationship do you have with your parents?

(Cross off for each line)	**Completely agree**	**Partly agree**	**Partly disagree**	**Completely disagree**
My parents know where I am and what I am doing at weekends……	☐	☐	☐	☐
My parents know where I am and what I am doing during the week……	☐	☐	☐	☐
My parents know who I am together with in my spare time	☐	☐	☐	☐
My parents like the friends I am together with in my spare time.....	☐ 1	☐ 2	☐ 3	☐ 4

10.6 When you think about your friends, would you say that: *(Cross off for each line)*

	Completely agree	**Partly agree**	**Partly disagree**	**Completely disagree**
I feel closely attached to my friends	☐	☐	☐	☐
My friends value my opinions	☐	☐	☐	☐
I can help/support my friends	☐	☐	☐	☐
I can count on my friends when I need help	☐ 1	☐ 2	☐ 3	☐ 4

10.7 How many persons <u>outside</u> your immediate family are so close to you that you can count on help if you:

Have personal problems ..... *Number of persons* ☐☐

Have practical problems *(e.g. with school work)* *Number of persons* ☐☐

10.8 Have you yourself been exposed to violence (been hit, kicked or similar) during the last 12 months.? *(One cross only!)*

Never ☐ 1 **Yes, only by youth** ☐ 2 **Yes, only by adults** ☐ 3 **Yes, by youth and adults** ☐ 4

U11. SEXUAL BEHAVIOUR AND CONTRACEPTION

	Yes, with one partner	**Yes, with several partners**	**No**
11.1 Have you ever had sexual intercourse?	☐	☐	☐

If you answered "NO", go straight to Y12

11.2 Age the first time? ..... ☐☐ *yrs*

11.3 Did you/both of you use contraception at your <u>last</u> intercourse?

No ☐ 1 **Yes, condom** ☐ 2 **Yes, p-pill/p-injection** ☐ 3 **Yes, other** ☐ 4 **Do not know** ☐ 5

	YES	**NO**	**Do not know**
11.4 Have you ever been pregnant/made a girl pregnant?	☐	☐	☐

If you answered "YES"

How old were you when this happened? ..... ☐☐ *yrs*

	YES	NO	Do not know
Did you/the girl have the pregnancy terminated ?.....	☐	☐	☐

U12. USE OF MEDICINES ETC.

12.1 How often in the course of <u>the last 4 weeks</u> have you taken the following medicines? *(Cross off for each line)*
In this case, medicines means medicine bought at a pharmacy.
Food supplements and vitamins are <u>not</u> included here)

	Never	Daily	Every week, but not every day	Less often than every week	Not taken during the last 4 weeks
Painkillers, off prescription	☐	☐	☐	☐	☐
Painkillers, on prescription	☐	☐	☐	☐	☐
Allergy-medicine.....	☐	☐	☐	☐	☐
Asthma-medicine	☐	☐	☐	☐	☐
Sleeping pills (sedatives).....	☐	☐	☐	☐	☐
Tranquilisers	☐	☐	☐	☐	☐
Anti-depressives	☐	☐	☐	☐	☐
Other medicine on prescription..	☐	☐	☐	☐	☐
	1	2	3	4	5

12.2 Write the name of the medicines you have crossed off above, and the reasons for taking them (illness or symptom):
(Cross of for how long you have taken the medicine)

Name of medicine: *(one name on each line)*	Reason for taking the medicine:	How long have you taken the medicine? Up to 1 yr	One year or more
_____		☐	☐
_____		☐	☐
_____		☐	☐

If there is not enough space above, you can continue on a separate sheet of paper and enclose this with the questionnaire.

QUESTIONS TO THE GIRLS:

	YES	NO
12.3 Have you started to menstruate?	☐	☐

If you answered "NO", go straight to 12.5

12.4 How old were you when you had your first menstruation?

I was ☐☐ *yrs*

12.5 Do you use, or have you used:

(Cross off for each line)	Now	Before, but not now	Never
P-pill/ mini-pill/ p-injection.....	☐	☐	☐
Other contraception.....	☐	☐	☐

What type of contraception?

_____

12.6 To those of you who take the p-pill/mini-pill:
What preparation are you using at present?:

_____

APPENDIX 4

QUESTIONNAIRE TO THE FOLLOW-UP STUDY: YOUTH 2004 IN OSLO AND HEDMARK

9. KOSTHOLD OG SLANKING

9.1 Hvor mye drikker du vanligvis av følgende? *(1/2 liter = 3 glass)*
(Sett ett kryss for hver linje)

	Sjelden/ aldri	1-6 gl. pr. uke	1 gl. pr. dag	2-3 gl. pr. dag	4 gl. el. mer pr. dag
Cola/brus med sukker..	☐	☐	☐	☐	☐
Cola/brus «light».....	☐	☐	☐	☐	☐
Fruktjuice	☐	☐	☐	☐	☐
	1	2	3	4	5

9.2 Hvor ofte spiser du vanligvis disse matvarene?
(Sett ett kryss for hver linje)

	Sjelden/ aldri	1-3 g. pr. mnd	1-3 g. pr. uke	4-6 g. pr. uke	1-2 g. pr. dag	3 g. el. mer pr. dag
Frukt, bær.....	☐	☐	☐	☐	☐	☐
Kokte grønnsaker.....	☐	☐	☐	☐	☐	☐
Rå grønnsaker/salat....	☐	☐	☐	☐	☐	☐
Feit fisk *(f.eks. laks, makrell, sild, ørret)*.....	☐	☐	☐	☐	☐	☐
Sjokolade/smågodt	☐	☐	☐	☐	☐	☐
Chips, potetgull	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6

9.3 Bruker du følgende kosttilskudd?
(Sett ett kryss for hver linje)

	Ja, daglig	Iblant	Nei
Tran, trankapsler, fiskeoljekapsler	☐	☐	☐
Vitamin-og/eller mineraltilskudd	☐	☐	☐

9.4 Har du noen gang prøvd å slanke deg? *(Sett bare ett kryss)*
Nei, aldri ☐1 Ja, tidligere ☐2 Ja, nå ☐3 Ja, hele tiden ☐4

9.5 Har du noen gang vært til behandling for spiseforstyrrelser?
Nei ☐ Nei, men jeg burde vært ☐ Ja ☐

9.6 Er det viktig for hva slags syn du har på deg selv at du er slank?
Ja, svært viktig ☐ Ja, nokså viktig ☐ Nei, ikke særlig viktig ☐

9.7 Har det i løpet av de siste 6 mnd. hendt at:

Du selv syntes at du var for tykk?
Ja, en god del ☐ Ja, litt ☐ Nei ☐

Du var redd for å legge på deg eller bli for tykk?
Ja, veldig ☐ Nokså ☐ Ikke særlig ☐ Nei ☐

Andre sa du var for tynn, mens du selv syntes at du var for tykk?
Ja, ofte ☐ Noen få ganger ☐ Nei ☐

Du følte at du mistet kontrollen mens du spiste og klarte ikke å stoppe før du hadde spist for mye?
Ja, minst to ganger i uka ☐ 1-4 ganger i måneden ☐ Sjelden eller aldri ☐

9.8 Har du gjort noe av følgende for å kontrollere vekten de siste 12 mnd.
(Sett ett kryss for hver linje)

	Minst 2 ganger i uka	1-4 ganger i mnd.	Sjelden	Aldri
Jeg spiser mindre	☐	☐	☐	☐
Jeg faster.....	☐	☐	☐	☐
Jeg driver hard fysisk trening	☐	☐	☐	☐
Jeg kaster opp.....	☐	☐	☐	☐
Jeg bruker avføringspiller eller vanndrivende midler	☐	☐	☐	☐
Jeg tar mettende/sult-dempende piller...	☐	☐	☐	☐
	1	2	3	4

Spørsmål 9.9 gjelder *bare jentene*. Gutter, hopp til pkt. 10.1.

9.9 Har du i løpet av de to siste årene slanket deg eller trent så mye at mensen har forsvunnet i 3 måneder eller mer? ..... Ja ☐ Nei ☐ Ikke fått mensen ☐

10. SEKSUELL ADFERD OG PREVENSJON

10.1 Har du noen gang hatt samleie
Ja, med en partner ☐ Ja, med flere partnere ☐ Nei ☐

Hvis «NEI» på pkt. 10.1, hopp til pkt. 11.1

10.2 Alder første gang? *Jeg var* ☐☐ *år*

10.3 Brukte du/dere prevensjon ved siste samleie?
Nei ☐ Kondom ☐ P-pille/ sprøyte/ring ☐ Nødprevensjon/ angrepillen ☐ Annet ☐ Vet ikke ☐

10.4 Har du noen gang blitt gravid/gjort ei jente gravid?
Ja ☐ Nei ☐ Vet ikke ☐

Hvis «NEI» hopp til pkt. 11.1

10.5 Hvor gammel var du da dette (sist) skjedde?
Jeg var ☐☐ år

10.6 Ble det utført abort?
Ja ☐ Nei ☐ Vet ikke ☐

11. BRUK AV MEDISINER

11.1 Hvor ofte har du i løpet av de siste 4 ukene brukt følgende medisiner? *(Sett ett kryss for hver linje)*
Med medisiner mener vi her medisiner kjøpt på apotek. Kosttilskudd og vitaminer regnes ikke med her.

	Aldri	Daglig	Hver uke, men ikke daglig	Sjeldnere enn hver uke	Ikke brukt siste måned
Smertestillende uten resept	☐	☐	☐	☐	☐
Smertestillende på resept	☐	☐	☐	☐	☐
Allergi-medisin.....	☐	☐	☐	☐	☐
Astma-medisin.....	☐	☐	☐	☐	☐
Sovemedisin.....	☐	☐	☐	☐	☐
Beroligende medisin.....	☐	☐	☐	☐	☐
Medisin mot depresjon.....	☐	☐	☐	☐	☐
Annen medisin på resept	☐	☐	☐	☐	☐
	1	2	3	4	5

11.2 Skriv navnet på medisinene som du har krysset av for ovenfor, og hva grunnen var til at du tok medisinene (sykdom eller symptom):
(Kryss av for hvor lenge du har brukt medisinen)

Navn på medisinen: (ett navn pr. linje)	Grunn til bruk av medisinen	Hvor lenge har du brukt medisinen? Inntil 1 år	Ett år eller mer
		☐	☐
		☐	☐
		☐	☐

Dersom det ikke er nok plass her, kan du fortsette på eget ark som du legger ved.

12. BRUK AV HELSETJENESTER

12.1 Har du i løpet av de siste 12 mnd. selv brukt?
(Sett ett kryss for hver linje)

	Ingen ganger	1-3 ganger	4 ganger eller mer
Skolehelsetjenesten	☐	☐	☐
Helsestasjon for ungdom.....	☐	☐	☐
Vanlig lege (Allmennpraktiserende lege).....	☐	☐	☐
PP-tjenesten.....	☐	☐	☐
Psykolog eller psykiater (privat eller på poliklinikk).....	☐	☐	☐
Psykiatrisk ungdomsteam	☐	☐	☐
Annen spesialist (privat eller på poliklinikk)	☐	☐	☐
Legevakt (privat eller offentlig)	☐	☐	☐
Sykehusinnleggelse.....	☐	☐	☐
Sosialtjenesten i kommunen	☐	☐	☐
Fysioterapeut.....	☐	☐	☐
Alternativ behandler	☐	☐	☐

13. HUD

13.1 Har du den siste uken hatt?

13.2 Hvis «JA», når startet hudplagen?

	Nei	Ja, litt	Ja, endel	Ja, mye	Siste 12 mnd.	Mer enn 12 mnd. siden
Kviser.....	☐	☐	☐	☐	☐	☐
Tørr hud	☐	☐	☐	☐	☐	☐
Kløende hud	☐	☐	☐	☐	☐	☐
Utslett.....	☐	☐	☐	☐	☐	☐
Andre hudplager	☐	☐	☐	☐	☐	☐
	1	2	3	4	1	2

13.3 Hvor på kroppen har du hudplager?
Ansikt ☐ Hodebunn ☐ Hender/håndledd ☐ Andre steder ☐

IN-5193-2087-1. 20.000 Bordrig 01.04

Ungdomshelse i Oslo, Oppland, Hedmark og Tromsø by

Dato for utfylling:
Dag ☐☐ Måned ☐☐ År ☐☐☐☐

1. EGEN HELSE

1.1 Hvordan er helsen din nå? *(Sett bare ett kryss)*
Dårlig ☐1 Ikke helt god ☐2 God ☐3 Svært god ☐4

1.2 Har du, eller har du hatt?

	Ja, nå	Ja, før	Nei
Astma.....	☐	☐	☐
Høysnue *(pollenallergi, allergisk reaksjon, rennende nese, svie i øynene)*	☐	☐	☐
Eksem.....	☐	☐	☐
Diabetes (sukkersyke).....	☐	☐	☐
Dysleksi	☐	☐	☐

1.3 Har du de siste 12 mnd hatt?
(Sett ett kryss for hver linje)

	Ja	Nei
Halsbetennelse (minst 3 ganger)	☐	☐
Bronkitt eller lungebetennelse	☐	☐
Psykisk plage som det er søkt hjelp for.....	☐	☐

1.4 Har du i løpet av de siste 12 mnd flere ganger vært plaget med smerter i? *(Sett ett kryss for hver linje)*

	Ja	Nei
Hode *(hodepine, migrene e.l.)*.....	☐	☐
Nakke/skuldre.....	☐	☐
Armer/ben/knær	☐	☐
Mage	☐	☐
Rygg	☐	☐

Hvis du har svart «NEI» på alle spørsmålene under 1.4: Hopp til pkt. 1.6

1.5 Har disse smertene ført til at du har vært hjemme fra skolen/studiene/jobben i løpet av de siste 12 mnd?
(Sett bare ett kryss)
Nei ☐1 Ja, 1-2 dager ☐2 Ja, 3-5 dager ☐3 Ja 6-10 dager ☐4 Ja, mer enn 10 dager ☐5

1.6 Hva veide du sist du veide deg? *Hele kilo* ☐☐☐

1.7 Hvor høy var du sist du målte deg? *Hele cm* ☐☐☐

2. MOSJON OG FYSISK AKTIVITET

2.1 Utenom skoletid (studie-, arbeidstid): Hvor mange ganger i uka driver du idrett/mosjon slik at du blir andpusten eller svett? ☐☐ *ganger pr uke*

2.2 Omtrent hvor mange timer pr. uke bruker du på dette?
0 timer ☐1 1-2 timer ☐2 3-4 timer ☐3 5-7 timer ☐4 8-10 timer ☐5 11 timer eller mer ☐6

2.3 Hvor slitsom er denne idretts-/mosjonsaktiviteten?
(Sett bare ett kryss)
Driver ikke idrett/mosjon ☐1 Litt anstrengende ☐2 Ganske anstrengende ☐3 Meget anstrengende ☐4 Svært anstrengende ☐5

2.4 Hvor ofte har du drevet med følgende treningsaktiviteter i løpet av de siste 12 mnd. i snitt? *(Sett ett kryss for hver aktivitetsgruppe)*

	Aldri	Under 1 gang pr uke	1 gang pr uke	Flere ganger pr uke
Utholdenhetsidrett *(f.eks. løp, sykling, langrenn, svømming)* ..	☐	☐	☐	☐
Lag-/ballidretter *(f.eks. squash håndball, fotball, ishockey)*.....	☐	☐	☐	☐
Estetisk idrett *(f.eks. dans, turn, aerobics)*	☐	☐	☐	☐
Styrkeidrett *(f.eks. bryting, vekttrening)*.....	☐	☐	☐	☐
Kampsport *(f.eks. judo, karate, taekwondo)*	☐	☐	☐	☐
Tekniske idretter *(f.eks. ridning, alpint, telemark, friidrett, snowboard, golf, rullebrett/skøyter)*..	☐	☐	☐	☐
Risikoidrett *(f.eks. elvepadling, fjellklatring, paragliding)*.....	☐	☐	☐	☐
Annet: *Kryss av*.....	☐	☐	☐	☐

og skriv aktivitet her:

Hvis du ikke driver med idrett/mosjon slik at du blir andpusten eller svett (utenom skoletid), gå direkte til pkt. 2.6

2.5 Hvor viktig er ulike årsaker til at du trener?
(Sett ett kryss for hvert utsagn)

	Svært viktig	Ganske viktig	Ikke viktig
Synes det er gøy.....	☐	☐	☐
Tenker klarere	☐	☐	☐
Er sammen med venner når jeg trener	☐	☐	☐
Liker å konkurrere.....	☐	☐	☐
Det er sunt.....	☐	☐	☐
Får større muskler.....	☐	☐	☐
Viser fremgang	☐	☐	☐
Slanker meg.....	☐	☐	☐
Andre synes jeg bør.....	☐	☐	☐

2.6 Har du sluttet med noen organisert idrettsaktivitet etter 10. klasse? ..... Ja ☐ Nei ☐

Hvis «JA»: hvor viktig er disse årsaker til at du har sluttet:

	Svært viktig	Ganske viktig	Ikke viktig
Vennene mine sluttet.....	☐	☐	☐
Det tok for mye tid	☐	☐	☐
Jeg synes ikke jeg var flink nok	☐	☐	☐
Lyst til å gjøre andre ting	☐	☐	☐
Likte ikke miljøet/treneren	☐	☐	☐
Lang reisevei	☐	☐	☐
Begynte med annen aktivitet	☐	☐	☐
Det ble for dyrt	☐	☐	☐
Måtte jobbe med skolen	☐	☐	☐

2.7 Driver du eller har du drevet med konkurranseidrett?
(Sett bare ett kryss)
Ja, nå ☐ Ja, før ☐ Nei, aldri ☐

2.8 Har du noen gang prøvd dopingmidler? *(Sett bare ett kryss)*
Nei, aldri ☐1 Ja, en gang ☐2 Ja, flere ganger ☐3 Ja, jeg bruker det regelmessig ☐4

2.9 Utenom skole/arbeidstid: Hvor mange timer pr. ukedag *(mandag til fredag)* **sitter du i gjennomsnitt foran TV, video og/eller PC (spill og internett)?** *(Sett bare ett kryss)*
Inntil 1 time ☐1 1-2 timer ☐2 3-5 timer ☐3 mer enn 5 timer ☐4

3. PÅKJENNINGER, MESTRING OG SOSIAL STØTTE

3.1 Under finner du en liste over ulike plager. Har du opplevd noe av dette den siste uken *(til og med i dag)*?
(Sett ett kryss for hver linje)

	Ikke plaget	Litt plaget	Ganske mye	Veldig mye
Plutselig frykt uten grunn	☐	☐	☐	☐
Føler deg redd eller engstelig	☐	☐	☐	☐
Matthet eller svimmelhet	☐	☐	☐	☐
Føler deg anspent eller oppjaget	☐	☐	☐	☐
Lett for å klandre deg selv	☐	☐	☐	☐
Søvnproblemer	☐	☐	☐	☐
Nedtrykt, tungsindig (trist)	☐	☐	☐	☐
Følelse av å være unyttig, lite verd	☐	☐	☐	☐
Følelse av at alt er et slit	☐	☐	☐	☐
Følelse av håpløshet mht. fremtiden	☐	☐	☐	☐
Følelse av ensomhet	☐	☐	☐	☐
Tanker om å gjøre slutt på livet ditt	☐ 1	☐ 2	☐ 3	☐ 4

3.2 Under finner du noen påstander.
(Sett ett kryss for hver linje)

	Helt galt	Nokså galt	Nokså riktig	Helt riktig
Jeg klarer alltid å løse vanskelige problemer hvis jeg prøver hardt nok	☐	☐	☐	☐
Hvis noen motarbeider meg, så kan jeg finne måter og veier for å få det som jeg vil	☐	☐	☐	☐
Hvis jeg har et problem og står helt fast, så finner jeg vanligvis en vei ut	☐	☐	☐	☐
Jeg føler meg trygg på at jeg ville kunne takle uventede hendelser på en effektiv måte	☐	☐	☐	☐
Jeg beholder roen når jeg møter vanskeligheter fordi jeg stoler på mine evner til å mestre/få til ting	☐ 1	☐ 2	☐ 3	☐ 4

3.3 Har du etter 10. klasse opplevd noe av følgende?

	Nei	Ja	Hvis «JA», opplevd siste 12 mnd?
Foreldre (foresatt) har blitt arbeidsløse eller uføretrygdet	☐	☐	☐
Alvorlig sykdom eller skade hos deg selv	☐	☐	☐
Alvorlig sykdom eller skade hos noen som står deg nær	☐	☐	☐
Dødsfall hos noen som sto deg nær	☐	☐	☐
Vært utsatt for seksuelle overgrep	☐	☐	☐
Selv blitt mobbet	☐	☐	☐
Opplevd vold i hjemmet	☐	☐	☐
Selv vært utsatt for vold fra ungdom	☐	☐	☐
Selv vært utsatt for vold fra voksne	☐	☐	☐

3.4 Når du tenker på familie og venner, vil du si at:
(Sett ett kryss for hver linje)

	Helt enig	Delvis enig	Delvis uenig	Helt uenig
Jeg føler meg knyttet til familien min	☐	☐	☐	☐
Familien legger vekt på mine meninger	☐	☐	☐	☐
Jeg betyr mye for familien min	☐	☐	☐	☐
Jeg kan regne med familien min når jeg trenger hjelp	☐	☐	☐	☐
Jeg føler meg nært knyttet til vennene mine	☐	☐	☐	☐
Vennene mine legger vekt på mine meninger	☐	☐	☐	☐
Jeg kan bidra/være til støtte for vennene mine	☐	☐	☐	☐
Jeg kan regne med vennene mine når jeg trenger hjelp	☐ 1	☐ 2	☐ 3	☐ 4

3.5 Har du etter 10. klasse opplevd noe av følgende? *(Sett ett kryss for hver linje)*

	Nei	Ja, av og til	Ja, ofte
Stort arbeidspress på skolen	☐	☐	☐
Stort press fra andre for å lykkes/ gjøre det bra på skolen	☐	☐	☐
Store vansker med å forstå læreren når hun/han underviser	☐	☐	☐

	Nei, aldri	Ja, nå	Ja, før
3.6 Har du, eller har du hatt kjæreste?	☐	☐	☐

Hvis du ikke går på skole, hopp til pkt. 4.1

3.7 Hvordan har du det på skolen?
(Sett ett kryss for hver linje)

	Helt enig	Delvis enig	Delvis uenig	Helt uenig
Jeg trives i klassen	☐	☐	☐	☐
Jeg har mye til felles med andre i klassen	☐	☐	☐	☐
Jeg føler meg knyttet til klassen	☐	☐	☐	☐
Lærerne mine setter pris på meg	☐	☐	☐	☐
Lærerne hjelper meg med fagene når jeg trenger det	☐	☐	☐	☐
Lærerne hjelper meg med personlige problemer hvis jeg trenger det	☐ 1	☐ 2	☐ 3	☐ 4

4. UTDANNING OG UTDANNINGSPLANER

4.1 Går du på skole/studerer eller jobber du? *(Sett bare ett kryss)*

- Videregående skole: allmenne-, økon.-adm. fag/idrettsfag/ musikk, dans og drama ☐ 1
- Videregående skole: yrkesfag med allmenn påbyggingskurs ☐ 2
- Videregående skole: yrkesfag ☐ 3
- Høyskole/universitet ☐ 4
- Folkehøyskole ☐ 5
- Jobber *(som hovedbeskjeftigelse)* ☐ 6
- Arbeidsledig ☐ 7
- Annet: *skriv her:* ☐ 8

4.2 Hva er den høyeste utdanning du har tenkt å ta?
(Sett bare ett kryss)

- Universitet eller høyskoleutdanning av høyere grad *(F.eks. master, lektor, advokat, sivilingeniør, lege)* ☐ 1
- Universitet eller høyskoleutdanning av lavere grad *(F.eks. bachelor, lærer, politi, sykepleier, ingeniør, journalist)* ☐ 2
- Videregående skole: allmenne-, økon.-adm. fag/idrettsfag/ musikk, dans og drama ☐ 3
- Videregående skole: yrkesfag ☐ 4
- Annet: *skriv her:* ☐ 5
- Har ikke bestemt meg ☐ 6

5. LESING OG SKRIVING

5.1 Har fagpersonell sagt at du har eller har hatt lese-/skrivevansker? *(Sett bare ett kryss)*

Ja, store ☐ 1 Ja, middels ☐ 2 Ja, lette ☐ 3 Nei ☐ 4

5.2 Hvor god er du til å lese nå? *(Sett bare ett kryss)*

Veldig god ☐ 1 God ☐ 2 Mindre god ☐ 3 Dårlig ☐ 4

5.3 Hvor godt liker du å lese? *(Sett bare ett kryss)*

Veldig godt ☐ 1 Godt ☐ 2 Mindre godt ☐ 3 Dårlig ☐ 4

5.4 Synes du det er vanskelig å lese underteksten på utenlandske filmer? *(Sett bare ett kryss)*

Ja, ofte ☐ 1 Ja, av og til ☐ 2 Sjelden ☐ 3 Aldri ☐ 4

5.5 Har du opplevd pinlige situasjoner fordi du ikke har lest riktig eller raskt nok? *(Sett bare ett kryss)*

Ja, ofte ☐ 1 Ja, av og til ☐ 2 Sjelden ☐ 3 Aldri ☐ 4

5.6 Har du vanligvis lett for å bytte om på bokstaver eller ord når du skriver? *(Sett bare ett kryss)*

Ja, ofte ☐ 1 Ja, av og til ☐ 2 Sjelden ☐ 3 Aldri ☐ 4

	Ja	Nei
5.7 Synes du rettskrivning er vanskeligere enn andre ting på skolen?	☐	☐

5.8 Hvilken karakter fikk du sist i norsk skriftlig? (termin-/standpunktkarakter) ☐

6. STERKE OG SVAKE SIDER

6.1 Hva slags oppfatning har du av deg selv? *(Sett ett kryss for hver linje)*

	Svært enig	Enig	Uenig	Svært uenig
Jeg har en positiv holdning til meg selv	☐	☐	☐	☐
Jeg føler meg virkelig ubrukelig til tider	☐	☐	☐	☐
Jeg føler at jeg ikke har mye å være stolt av	☐	☐	☐	☐
Jeg føler at jeg er en verdifull person, i hvert fall på lik linje med andre	☐	☐	☐	☐
Jeg er fornøyd med kroppen min	☐ 1	☐ 2	☐ 3	☐ 4

6.2 Svar på grunnlag av slik du har hatt det de siste 6 månedene.
(Sett ett kryss for hver linje)

	Stemmer ikke	Stemmer delvis	Stemmer helt
Jeg prøver å være hyggelig mot andre. Jeg bryr meg om hva de føler	☐	☐	☐
Jeg er rastløs. Jeg kan ikke være lenge i ro	☐	☐	☐
Jeg har ofte hodepine, vondt i magen eller kvalme	☐	☐	☐
Jeg deler gjerne med andre *(mat, spill, andre ting)*	☐	☐	☐
Jeg blir ofte sint og har kort lunte	☐	☐	☐
Jeg er ofte for meg selv. Jeg gjør som regel ting alene	☐	☐	☐
Jeg gjør som regel det jeg får beskjed om	☐	☐	☐
Jeg bekymrer meg mye	☐	☐	☐
Jeg stiller opp hvis noen er såret, lei seg eller føler seg dårlig	☐	☐	☐
Jeg er stadig urolig eller i bevegelse	☐	☐	☐
Jeg har en eller flere gode venner	☐	☐	☐
Jeg slåss mye. Jeg kan få andre til å gjøre det jeg vil	☐	☐	☐
Jeg er ofte lei meg, nedfor eller på gråten	☐	☐	☐
Jeg blir som regel likt av andre på min alder	☐	☐	☐
Jeg blir lett distrahert, jeg synes det er vanskelig å konsentrere meg	☐	☐	☐
Jeg blir nervøs i nye situasjoner. Jeg blir lett usikker	☐	☐	☐
Jeg er snill mot de som er yngre enn meg	☐	☐	☐
Jeg blir ofte beskyldt for å lyve eller jukse	☐	☐	☐
Andre unge plager eller mobber meg	☐	☐	☐
Jeg tilbyr meg ofte å hjelpe andre *(foreldre, lærere, barn, andre unge)*	☐	☐	☐
Jeg tenker meg om før jeg handler *(gjør noe)*	☐	☐	☐
Jeg tar ting som ikke er mine hjemme, på skolen eller andre steder	☐	☐	☐
Jeg kommer bedre overens med voksne enn de på min egen alder	☐	☐	☐
Jeg er redd for mye, jeg blir lett skremt	☐	☐	☐
Jeg fullfører oppgaver. Jeg er god til å konsentrere meg	☐	☐	☐

6.3 Samlet, synes du at du har vansker på en eller flere av følgende områder: med følelser, konsentrasjon, oppførsel eller med å komme overens med andre mennesker?

Nei ☐ 1 Ja, små vansker ☐ 2 Ja, betydelige vansker ☐ 3 Ja, alvorlige vansker ☐ 4

Hvis du har svart «NEI», gå direkte til pkt. 7.1

6.4 Hvor lenge har disse vanskene vært tilstede?

Mindre enn en måned ☐ 1 1-5 måneder ☐ 2 6-12 måneder ☐ 3 Mer enn ett år ☐ 4

6.5 Forstyrrer eller plager vanskene deg?

Ikke i det hele tatt ☐ 1 Bare litt ☐ 2 En god del ☐ 3 Mye ☐ 4

6.6 Virker vanskene inn på livet ditt på noen av disse områdene?

	Ikke i det hele tatt	Bare litt	En god del	Mye
Hjemme/i familien	☐	☐	☐	☐
Forhold til venner	☐	☐	☐	☐
Fungering på skole, i jobb	☐	☐	☐	☐
Fritidsaktiviteter	☐ 1	☐ 2	☐ 3	☐ 4

6.7 Er vanskene en belastning for de rundt deg?
(familie, venner, lærere osv.)

Ikke i det hele tatt ☐ 1 Bare litt ☐ 2 En god del ☐ 3 Mye ☐ 4

7. OPPVEKST OG TILHØRIGHET

7.1 Jeg tror vår familie, sett i forhold til andre i Norge, har:
(Sett bare ett kryss)

Dårlig råd ☐ Middels råd ☐ God råd ☐ Svært god råd ☐

7.2 Er far og/eller mor i arbeid nå?

	Ja, heltid	Ja, deltid	Arbeidsløs/ trygdet	Hjemme-værende	Går på skole/ studerer	Død
Far:	☐	☐	☐	☐	☐	☐
Mor:	☐	☐	☐	☐	☐	☐

7.3 Mine foreldre er: *(Sett bare ett kryss)*

Gift/ samboere ☐ 1 Ugift ☐ 2 Skilt/ separert ☐ 3 En eller begge er døde ☐ 4 Annet ☐ 5

7.4 Hvem bor du sammen med nå? *(Sett bare ett kryss)*
(Ta ikke med søsken og halvsøsken)

Mor og far ☐ Bare mor ☐ Bare far ☐ Omtrent like mye hos mor og far ☐ Mor/far og ny samb./ektefelle ☐

Foster-foreldre ☐ Bokol-lektiv ☐ Alene på hybel/leil. ☐ Sammen med kjæreste ☐ Andre ☐

8. ADFERD

8.1 Har du gjort eller vært med på noe av dette de siste 12 mnd.?
(Sett ett kryss for hver linje)

	Aldri	1-5 ganger	6-10 ganger	Mer enn 10 ganger
Stjålet penger eller ting fra noen i familien din	☐	☐	☐	☐
Lurt deg fra å betale på kino, buss, tog e.l.	☐	☐	☐	☐
Slått eller truet med å slå noen	☐	☐	☐	☐
Skulket skole/jobb	☐	☐	☐	☐
Sniffet	☐	☐	☐	☐
Bannet til lærer/overordnet på jobb	☐	☐	☐	☐
Bare til deg som går på skolen: Blitt innkalt til rektor for noe galt du har gjort	☐	☐	☐	☐
Bare til deg som bor hos en eller begge foreldre: Vært hjemmefra en hel natt uten at foreldrene visste hvor du var, eller du sa at du var et annet sted enn du var i virkeligheten	☐	☐	☐	☐

8.2 Røyker du, eller har du røykt? *(Sett bare ett kryss)*

Nei, aldri ☐ 1 Ja, men jeg har sluttet ☐ 2 Ja, av og til ☐ 3 Ja, hver dag ☐ 4

8.3 Bruker du eller har du brukt snus, skrå e.l.? *(Sett bare ett kryss)*

Nei, aldri ☐ 1 Ja, men jeg har sluttet ☐ 2 Ja, av og til ☐ 3 Ja, hver dag ☐ 4

Hvis du har svart **«NEI, ALDRI»** på pkt. 8.2 **og** 8.3: hopp til pkt. 8.5

8.4 Hvor gammel var du da du begynte å:

Røyke? ☐☐ år Snuse? ☐☐ år

8.5 Omtrent hvor ofte har du i løpet av det siste året drukket alkohol?
(Sett bare ett kryss) (Lettøl og alkoholfritt øl regnes ikke med)

2-7 ganger i uka ☐ 1 gang i uka ☐ 1-3 ganger i måneden ☐ Noen få ganger i året ☐ Aldri ☐

8.6 Har du noen gang drukket så mye alkohol at du har vært beruset (full)? *(Sett bare ett kryss)*

Nei, aldri ☐ 1-4 ganger ☐ 5-10 ganger ☐ 11-25 ganger ☐ 26-50 ganger ☐ Over 50 ganger ☐