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SHORT COMMUNICATION

The low prevalence of smoking in the Northern Sweden MONICA study, 2009

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Abstract

Aims: The purpose of this study was to describe tobacco use in the 2009 Northern Sweden cohort of the World Health Organization Multinational Monitoring of Trends and Determinants in Cardiovascular Diseases (MONICA) study. **Methods:** Subjects ($N = 1698$) were randomly selected from population registers, stratified for age (25–74 years old) and gender, in the two northernmost Swedish counties of Norrbotten and Västerbotten. Responses from tobacco-related questions were used to develop three mutually exclusive categories of snus use: past, current, or never use; and three comparable categories of smoking that were consistent with previous studies. **Results:** Among men, the prevalence of smoking (9%) and dual use (2%) remain unchanged from 2004, although the prevalence of snus use declined from 27% in 2004 to 24% in 2009. Among women, the prevalence of all forms of tobacco use declined between 2004 and 2009; smoking dropped from 16% to 11%, dual use from 2% to less than 1%, and snus use from 9% to 8%. Although overall prevalence of tobacco use was similar for younger versus older men and younger versus older women, there were notable differences in specific snus and smoking rates. **Conclusions:** This study confirms that use of snus was a significant factor in the low prevalence of smoking, especially among younger men and women in Northern Sweden. Furthermore, it documents that tobacco harm reduction is entirely compatible with a population-level decline in overall tobacco use.

Key Words: Dual use, MONICA, northern Sweden, smoking, snus use

Snus, a form of oral tobacco, has been used for over 200 years in Sweden, a country which has high-quality health surveillance. It is therefore ironic that there is very little detailed information on population prevalence of snus use available from government sources. Fortunately, the deficit has been mitigated partially by a series of surveys from the Northern Sweden component of the World Health Organization Multinational Monitoring of Trends and Determinants in Cardiovascular Diseases (MONICA) study.

These surveys collected information on smoking and snus use in Norrbotten and Västerbotten, the northernmost Swedish counties, in 1986, 1990, 1994, 1999 and 2004 [1,2].

The MONICA surveys reveal that smoking prevalence rates are strongly and inversely correlated with

prevalence of snus use, both across time and across age groups, for men and for women. The smoking decline in Northern Sweden, mediated by a reduction in smoking initiation and by increased cessation due to snus use [1], provides population-level evidence that tobacco harm reduction is an effective public health strategy [3].

In 2009, a new survey was conducted by the Northern Sweden MONICA group, based at Umeå University [4]. The purpose of this study was to describe tobacco use in the 2009 cohort.

Methods

This study used the 2009 dataset provided by the Northern Sweden MONICA project. Subjects were randomly selected from population registers,

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stratified for age (25–75 years old) and gender, in the two northernmost Swedish counties of Norrbotten and Västerbotten.

Survey participants completed questionnaires that were focused on cardiovascular disease risk factors. In addition to questions regarding cigarette smoking on the standard MONICA questionnaire, the Northern Swedish version included detailed questions regarding current and former snus use. Responses from tobacco-related questions were used to develop three mutually-exclusive categories of snus use: former, current, or never use; and three comparable categories of smoking that were consistent with previous studies [1,2]. Concurrent smoking and snus use were classified as dual use. The smoking quit-rate was defined as the proportion of ever smokers (current + former smokers) who were former smokers at the time of the survey.

Tobacco use is reported as gender-specific prevalence. When comparing 2009 prevalence with earlier MONICA surveys, the population was restricted to age 25–64 years. Differences in prevalence between 2004 and 2009 were evaluated by the test for difference between two independent proportions [5].

The MONICA 2009 population survey was approved by the Research Ethics Committee of Umeå University, and all participants gave informed consent; this study was approved by the institutional review board at the University of Louisville.

Results

The dataset consisted of 1729 subjects, of whom 1698 (98%) had complete information on tobacco use. This reflects a 69% participation rate, continuing a decline from 81% during the first year of the survey series (1986) [4]. There were similar proportions of men (49%) and women, and subjects were fairly equally distributed among five age groups from 25–34 years to 65–75 years.

Figure 1 shows the prevalence of tobacco use among men and women age 25–64 years in 2009, in the context of previous MONICA surveys [1,2]. Among men, the prevalence of all tobacco use declined from 38% in 2004 to 35% in 2009 ($p = .23$), largely due to a decrease in snus use from 27% in 2004 to 24% in 2009 ($p = .27$). Smoking (8.8%) and dual use (2%) in 2009 remained unchanged from 2004. Among women, the prevalence of all forms of tobacco use declined from 27% in 2004 to 20% in 2009 ($p = .001$); smoking dropped from 16% to 11% ($p = .005$), dual use from 2% to less than 1% ($p = .04$), and snus use from 9% to 8% ($p = .65$).

The prevalence of former smoking was 27% for men and 31% for women in 2009. Among men, only

27% of former smokers were never snus users, 39% were current snus users and 34% were former snus users. Among women former smokers, 70% never used snus, 19% were current users and the remainder were former snus users.

The smoking quit rate among men was 71%; 52% were ever users of snus and 19% were never users. This was consistent with earlier surveys [1]. The quit rate among women was 72%, which was considerably higher than previous years [1], reflecting increases in both ever users of snus (21%) and never users (51%).

The prevalence of all tobacco use among men and women age 65+ years was 24% and 13%, respectively; proportions of smoking, snus and dual use were similar to those among subjects age 25–64 years. The prevalence of former smoking was 45% among men and 35% among women.

Figure 2 shows detailed tobacco use categories in 2009 for younger (25–44 years) and older (45–75 years) men and women. Although overall prevalence of tobacco use was similar for younger versus older men and younger versus older women, there were notable differences in specific snus and smoking rates. Younger men had a smoking rate of 4.4%; it was the only group with fewer exclusive smokers (1.7%) than smokers who were former snus users (2.7%). The prevalence of snus use was 25.4%; most (18.6%) were exclusive users. Among older men the smoking prevalence was 10.8%, dominated by exclusive smokers (8.4%). The prevalence of snus use was 20.5%, and former smokers comprised the majority (11.7%).

Younger women also had a low smoking rate (7.4%); most were exclusive smokers (6.2%). The prevalence of snus use was 9.9%, and almost two thirds (6.2%) were former smokers. Among older women smoking prevalence was 13.4%, dominated by exclusive smokers (12.5%). The prevalence of snus use was 5.0%, and the vast majority were former smokers (4.1%).

Discussion

Compared with 2004, the prevalence of all forms of tobacco use in northern Sweden in 2009 was 8% lower among men and 25% lower among women, which is the first substantial overall decline in this population. While smoking only declined minimally in men (–2%), it was considerably lower in women (–30%). Snus use was also lower in both men (–11%) and in women (–9%). Previous MONICA surveys documented that smoking declined among men over the 18 years from 1986 to 2004, and among women from 1994 to 2004 [1,2]. These declines were concomitant with increases in snus use, which prompted some concerns. But this report clearly documents

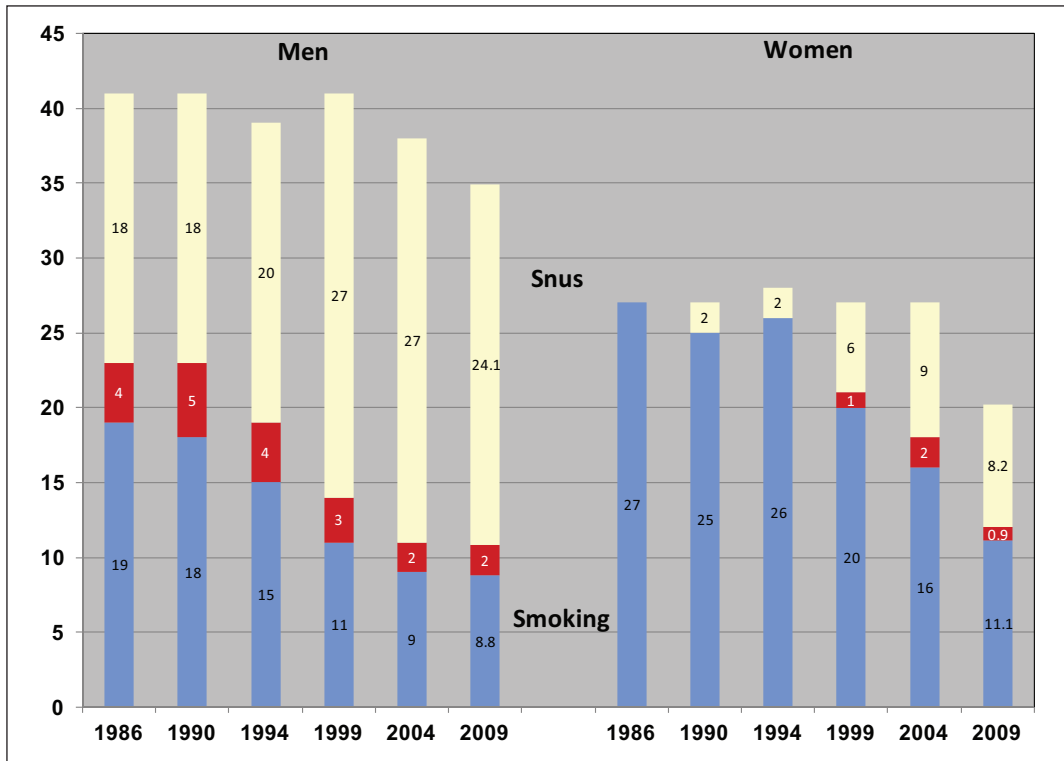


Figure 1. Prevalence of snus use (white), smoking (blue) and dual use (red) among men and women aged 25–64 years in Northern Sweden, 1986–2009.

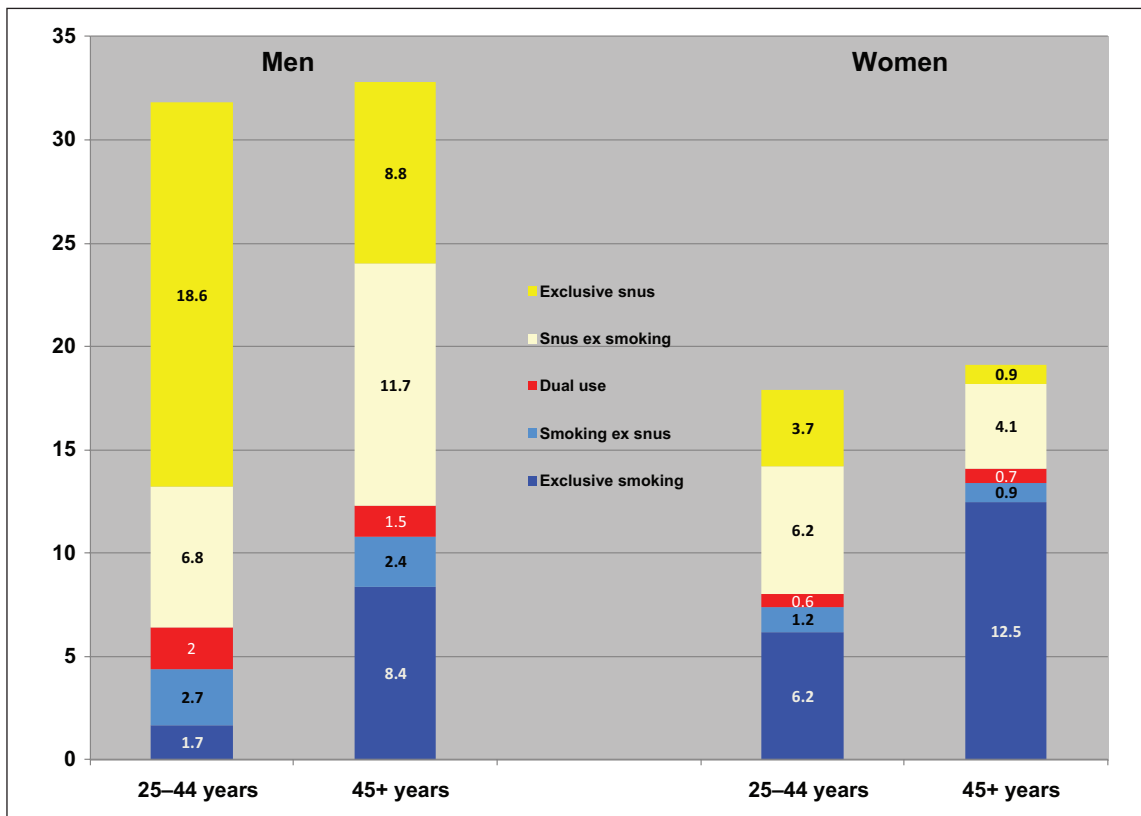


Figure 2. Detailed prevalence of snus use and smoking among younger and older men and women in Northern Sweden, 2009.

that tobacco harm reduction is not contrary to overall reductions in tobacco use at the population level.

Critics of tobacco harm reduction in the US frequently express concerns that the promotion of this strategy will lead to dual use [6], and that dual use will result in lower rates of nicotine/tobacco abstinence [7]. American and Swedish longitudinal studies reveal that dual users are less likely to become completely tobacco-abstinent, but they are more likely than exclusive smokers to quit smoking [8]. This study demonstrates that, despite high prevalence of snus use in this population, dual use is minimal and perhaps even declining. Furthermore, a longitudinal follow-up study of this population revealed that the majority of dual users subsequently become exclusive snus users or tobacco-free [9].

The prevalence of all tobacco use was similar among younger and older men, but the prevalence of smoking was much lower among the former (4.4% versus 10.8%). This is remarkably different from other developed countries, where smoking tends to be more prevalent among younger men. The difference is offset by much higher prevalence of snus use among younger men, an observation noted in an earlier study [1]. The same pattern is also seen among women, although smoking rates are higher and snus use rates are lower than the corresponding male groups.

Major strengths of the MONICA data are the population-based design and the standardized data collection in all surveys. A limitation is the lower participation rate among smokers in all surveys from northern Sweden, which may have resulted in an underestimate of smoking prevalence, especially among younger age groups in 2009 [4].

Conclusions

This study confirms that snus use was a significant factor in the low prevalence of smoking, especially among younger men and women in Northern Sweden. Furthermore, it documents that tobacco

harm reduction is entirely compatible with a population-level decline in overall tobacco use.

Conflicts of interest

None declared.

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