Smoking in a non-smoking environment:

Inequality, stigmatization and resistance

Marianne Lund

Norwegian Institute for Alcohol and Drug Research

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Department of Sociology and Human Geography, University of Oslo

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“In a culture where rationality and self-control are supremely valued, a person who affirms that he cannot control himself loses face and is ridiculed. However, a person who intends to exert control, but cannot despite his best ‘will power’, is admired and excused for his failing. One is only condemned if on does not try.” (Stein, 1985).

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Marianne Lund, Oslo, March 2016

Contents

Appendix

Appendix 1: Questions from the Norwegian Tobacco Survey (in Norwegian)

Appendix 2: Supplementary table, paper 2

Appendix 3: Questionnaire used in paper 4 (in Norwegian)

Summary

In Norway, the prevalence of daily smoking has gradually declined from 50% among men and 30% among women in the early 1970s to 13% in both genders in 2015. The rate of occasional smoking has remained stable at approximately 10% in recent decades. Presumably, this decline in the historically prevalent and socially rooted practice of smoking signals the final stage of the tobacco epidemic, which is characterized by an increasing social gradient within the steadily decreasing segment of smokers. Norway was once a pioneer in tobacco control and introduced a comprehensive governmental program to reduce smoking, including a total ban on tobacco advertising starting in the mid-1970s. Since then, most of the policy instruments recommended by the World Health Organization to combat smoking have been implemented. In addition to a robust infrastructure for tobacco control, there has also been a focus on social denormalization strategies to make cigarettes less desirable and less accessible, and the act of smoking less acceptable. However, given the severe harm associated with smoking, the tobacco control community considers the decline in smoking to be too slow. In particular, there has been a concern for a possible asymptotic plateau in smoking rates. Whether smoking rates will tend to flatten in countries that have reached the last phase of the tobacco epidemic has also been an issue for researchers. One approach has been to investigate the number of "hardcore smokers" to test the much-discussed "hardening hypothesis". Hardcore smokers are inveterate smokers who do not want to or are not able to quit smoking and therefore are considered a difficult segment to reach by traditional tobacco control measures. The hardening hypothesis postulates that the proportion of hardcore smokers will increase as smoking prevalence declines.

The overall aim of this thesis is to increase our understanding of those who continue to smoke, as the normative and socio-material climate tends to facilitate non-smoking. I use various survey data sets to address four main topics in this thesis. The first paper investigates the size of the hardcore smoker group and whether the relative size of the group has changed over time in the population of smokers. We concluded that the size of the hardcore group of smokers remains relatively moderate in Norway, and we found little support for the hardening hypothesis. However, this conclusion depends

upon how hardcore smokers are operationalized. Increased knowledge about the mechanisms underlying smokers' willingness and/or ability to quit is needed.

The second paper examines differences between smokers and snus users and their perceptions of their own tobacco use, self-evaluative emotions, perceived moral judgment and social disapproval of their tobacco use. Compared with snus users, we observed that smokers tend to hold more negative emotions about and experience more social disapproval of their tobacco behaviour.

Social inequality in smoking behaviour is addressed in the third paper. More precisely, I set out to explore the associations between education, income and the risk of smoking. I conclude that low education is associated with a greater risk of dependence, heavy smoking and having no intention to quit.

The last paper in this thesis explored public opinions for 16 novel tobacco control strategies. Smokers opposed all of the proposed strategies except banning smoking in cars carrying children, increasing the age limit for purchasing cigarettes, and banning smoking at transportation stops. The legitimacy of the newly proposed tobacco control measures is discussed within a justification framework.

Overall, I conclude that many smokers experience a subjective feeling of stigmatization, they express resistance to increased tobacco control measures and there are some signs of social marginalization processes. In the thesis, these results are discussed in a social inequality and social resistance framework. In addition, smoking is discussed in relation to social stigma and neutralization of risk. The mechanisms underlying the inequality, stigmatization and resistance associated with smoking behaviour need further investigation.

List of papers:

Paper I Lund, M., Lund, K.E., Kvaavik, E. (2011). "Hard-core smokers in Norway 1996–2009". *Nicotine and Tobacco Research* 13(11), 1132–1139.

Paper II Lund, M., Lund, K.E., Halkjelsvik, T. (2014). "Contrasting smokers' and snus users' perception of personal tobacco behavior in Norway". *Nicotine and Tobacco Research* 16(12), 1577–1585.

Paper III Lund, M. (2015). "Social inequality in cigarette consumption, cigarette dependence, and intention to quit among Norwegian smokers". *Hindawi Publication, Special Issue on Tobacco Disparities, BioMed Research International,* 2015, 1–7.

Paper IV Lund, M. (2016). "Exploring smokers' opposition to proposed tobacco control strategies". Submitted to NAD, Nordic Studies on Alcohol and Drugs, March 2016.

1. Introduction

1.1 Aim of the study

The overall aim that this thesis examines is how we can understand continued smoking among adults in the last phase of the smoking epidemic, given that smoking is harmful to one's health and socially condemned. The last phase of the tobacco epidemic is defined by a parallel but slow decline in smoking prevalence among both genders, and an expected fall in the rates of lung cancer among men (Lopez et al., 1994; Thun et al.,2012). The last stage of the tobacco epidemic is expected to be different for men and women in developed countries (Thun et al., 2012). In Norway, the incidence rates for lung cancer among women are still increasing, whereas the rates for men are decreasing (Cancer Registry of Norway, 2014). The smoking epidemic follow the same pattern as described in the diffusion of innovation model (Rogers, 2003). The group that adopts an innovation last is described as "laggard", and persistent smokers share this description, as they have not adopted the "innovation" of non-smoking (quit smoking).

The four papers presented in this thesis illustrate several points. First, at an aggregate level, there is a "softening" tendency in the smoking population; the willingness to quit among the remaining smokers is increasing (paper 1). This finding stands in contrast to the "hardening hypothesis", which suggests that as smoking prevalence declines, the remaining population of smokers will be more "hardcore" and less able to change their smoking behaviour. At the individual level, there are indications that smokers both regret their smoking behaviour and experience strong social disapproval of their smoking, in contrast to other tobacco users, such as snus users (paper 2). Social inequality in smoking behaviour is well documented. Even in the smoking population, which is highly selected regarding educational level, socio-economic status (SES) differences are found on indicators that increase the risk for continued smoking, strong cigarette dependence and low motivation to quit (paper 3). Finally, Norway has implemented most of the available tobacco control measures, and new strategies have been proposed. Except for banning smoking in cars carrying children, smokers oppose

most of the proposed tobacco control strategies. Smoker's opposition is somewhat weaker for regulations that aim to reduce the uptake of smoking by the young, but oppose increased regulation in some outdoor settings, specifically the proposal of banning smoking at outdoor seating's at bars and restaurants (paper 4).

There is no single theory in the social sciences that adequately explains smoking behaviour (Dixon & Banwell, 2009). Therefore, several theoretical explanations are presented in this thesis in an attempt to increase our understanding of continued smoking in a non-smoking environment. To a large extent, smoking is driven by addiction, but the behaviour is also shaped by social conditions and imperatives (Ford, 2001). Social science theories are an important complement to the problem of nicotine dependence, and the contribution they make has become more and more important as smoking has become less prevalent and marginalized.

1.2 Concepts

The phenomenon of persistent smoking in a normative non-smoking environment needs a broad approach and sociological imagination. Homans (1974) developed different categories of conformers and non-conformers to social norms, including the "holdouts", who "did not find the results of conformity rewarding and never conform". Holdout refers to the act of resisting something or refusing to accept what is offered. In an interview with "the last remaining refuges for the New York City smoker", smokers were described as "the holdouts", as the ones who have "survived the ever-scarier health warnings … the ones who have persisted despite legislation banning butts from bars, restaurants and office buildings…. The ones who can't, wont or just don't give it up" (Alvarez, 2010).

In the tobacco literature, this type of person has been conceptualized as a "hardcore smoker". The substantive definition of a hardcore smoker is a "daily, long-term smoker who is unable or unwilling to quit, and who is likely to remain so even when possessing extensive knowledge about the hazards of smoking and when confronting substantial social disapprobation of smoking" (Warner & Burns, 2003). This concept has been operationalized in different ways in empirical studies, including

variables such as no quit attempts, high level of cigarette consumption, no motivation to quit and high degree of nicotine dependence (Costa et al., 2010). Other labels for smokers that are similar to hardcore smokers are “immotive smokers” (Ladwig et al., 2005), “low-probability quitters” (Pierce et al.,1998), and “pre-contemplators” (Prochaska & Diclemente, 1982). Smoking is regarded as a highly ambivalent behaviour because of the addiction to nicotine; many smokers repeatedly fail in their attempts to quit smoking despite genuine intentions to do so (Heather, 1998). All of these concepts denote a smoking profile associated with smoking continuation.

An operationalization of “holdout smokers” is necessary to measure the size of the group and track changes in the size of the group over time. The concept of the hardcore smoker is operationalized to measure the phenomenon of continued smoking. Today’s smokers also have a social profile associated with an increased probability of continued smoking; smokers consist mainly of people with a low SES. The *poor smoker* is a social and policy dilemma: people that are more affluent have given up smoking, whereas people in lower social positions in society have not (Marsh & McKay, 1994).

Box 1: Tobacco control in Norway

1973	The Tobacco Act was sanctioned; monitoring of smoking prevalence started.
1975	Implementation of the Tobacco Act.
1980	Informational materials published by non-government organizations on passive smoking.
1984	Health warning on cigarette packaging.
1985	The National Council on Tobacco and Health published the "Clean Air for Everyone" report: A proposal to implement smoke-free air laws.
1988	Implementation of the smoke-free air law in public indoor areas and on public transportation, with an exception made for the hospitality industry.
1989	Regulation prohibiting the import, sale and manufacture of new nicotine and tobacco products.
1993	Partial ban on smoking in the hospitality industry; one-third of indoor areas to be smoke-free.
1996	Further refinement of the Tobacco Act, banning smoking in open restaurants, age limits for purchasing and selling tobacco set at 18 years, and a ban on indirect advertising of tobacco products.
1998	Further restrictions on smoking in the hospitality industry, including a ban on smoking in 50% of the establishment.
1999	A long-term strategy for tobacco control 1999–2003 published by the Ministry of Health and Social Affairs.
2002	The EU Directive 2001/37/EC concerning the manufacturing, sale and presentation of tobacco products was implemented in Norwegian legislation. A ban on misleading descriptions such as "light" and "mild", larger health warnings and a legal basis for demanding disclosure of ingredients in tobacco products were implemented.
2004	A ban on smoking in the hospitality industry was implemented.
2006	The "National strategy for tobacco control 2006–2010" and the "National strategy on COPD 2006–2001" were launched by the Ministry of Health.
2009	Pictorial health warnings on smoking tobacco products were implemented.
2010	The introduction of a tobacco display ban (to keep tobacco products out of sight of customers).
2012	Norway (The Ministry of Health) won a case after being sued by Philip Morris (PM), claiming that the display ban violates the EEA agreement. PM did not appeal the verdict.
2013	The Ministry of Health and Care Services launched "A tobacco-free future. National strategy for tobacco control 2013–2016". Stronger tobacco control strategies were planned.
2014	The EU adopted Directive 2014/40/EU, which recommended regulation of electronic cigarettes. A white paper titled, "Folkehelsemeldingen", proposed harm reduction strategies as a supplement to tobacco control.
2015	The Ministry of Health and Care Services proposed changes to the Tobacco Act based on the EU Directive 2014/40/EU (20), which allowed the sale of e-cigarettes with nicotine.

2. Background

2.1 Tobacco policy controversies

The prevalence of daily smoking has gradually declined in Norway, from 50% for men and 30% for women in the early 1970s to 13% among both men and women in 2015 (Norwegian Institute for Alcohol and Drug Research, 2015). Norway has strict tobacco regulations, which historically were implemented early, with a ban on tobacco advertising in 1975. The Tobacco Act of 1975 has been renewed several times, with an important change in the legislation in 2004 that banned smoking in all bars and restaurants. In 2010, the display of tobacco products was banned, which means that retailers must hide their tobacco products from customers (Box 1). The Norwegian tobacco control program also consists of anti-smoking media campaigns. Since 2003, several such campaigns have been launched, varying in type and intensity. These campaigns have used both fear appeals and other emotional persuasion strategies. Despite 50 years of information and regulation, 22% of Norwegians still smoke cigarettes (when occasional smokers are included). As a partner in the World Health Organization's Framework Convention on Tobacco Control, a number of tobacco control initiatives have been made since the ratification of the convention in 2003.

Even though there is a downward trend in smoking, tobacco control advocates consider the decline to be too slow. It is estimated that conventional tobacco control policies reduce smoking by between 0.5 and 1.0 percentage points per year, and that these rates are too low given the health burden to society (Royal College of Physicians, 2008). There is also concern about a plateauing of the smoking rate. In the final phase of the tobacco epidemic, tobacco policy discussions focus on how to reduce smoking rates. These discussions are polarized; one side focuses on fighting all forms of tobacco use and striving for a tobacco-free society, and the other side focuses on fighting to reduce tobacco-related diseases and gain acceptance for harm reduction strategies. The first group is strongly dedicated to so-called endgame strategies, meaning "multiple, new and radical approaches to bring smoking prevalence to near-zero levels" (Arnott, 2013). The other group sees harm-reduction as part

of the solution to the smoking problem. A product is harm reducing if it lowers total tobacco-related mortality and morbidity, even if use of the product may involve continued exposure to tobacco-related toxicants (Stratton, 2001).

In tobacco harm reduction discussions, the debate is mainly about electronic nicotine delivery systems (ENDS), also known as electronic cigarettes (e-cigarettes), and related vapour products. Opponents of e-cigarettes want to phase out all forms of tobacco and nicotine; some of these sceptics have a moralistic orientation, whereas others highlight the precautionary principle strongly rooted in public health (Lund, 2009). Those who support the use of e-cigarettes, the pragmatists, are dedicated proponents of harm reduction strategies who focus on the social characteristics of the remaining smoking population (Lund, 2009). At present, the controversies of tobacco control are exemplified by the discussion about e-cigarettes, their role in tobacco control and how they should be regulated (Jollye, 2014; McKee et al., 2014).

2.2 Hardening or softening?

The hardening hypothesis states that, as smoking prevalence decreases, the remaining smokers will be more *hardcore* and less receptive to tobacco control. As early as 1979, concerns were raised that as smoking prevalence declined, the remaining smokers would be "heavy smokers" and more addicted smokers with less ability to quit. This group of smokers was described as "die-hard" smokers, with a clear link to nicotine dependence as the driving mechanism (Coambs et al., 1989). In subsequent years, this group of smokers was labelled as hardcore smokers, and it was felt that "hard-core smokers (heavily dependent or disinclined to quit) may slow down the rate of decline in prevalence as they become a greater proportion of the smoking population" (Pierce et al., 1989). Hardening occurs when "the average ability or desire of smokers to quit is falling" (Warner & Burns, 2003). Others have defined hardening as the "decreased ability to remain abstinent on a given quit attempt due to increased nicotine dependence" (Hughes, 2011). This definition regards hardening as an aspect of nicotine addiction; it does not take into account possible changes in willingness to quit. The hardening

hypothesis and the concept of the hardcore smoker have been dominated by a medical model in which nicotine dependence is the main mechanism (Hughes, 2011).

The hardening hypothesis has been widely debated and empirically investigated, but the results are varied. Several studies reject the hypothesis (Azagba, 2014; Fernandez et al., 2015; Hughes, 2011; Kulik & Glantz, 2015; Smith et al., 2014a), whereas some studies show support for the hypothesis (Clare et al.,2014; Fagerstrom & Furberg, 2008; Irvin & Brandon, 2000; Irvin et al., 2003; Talati et al., 2016). There is also substantial variation in methods and designs used.

In the first paper in this thesis, hardcore smokers were defined as smokers with no intention to quit in the short- or long-term, including no recent quit attempts. The size of the hardcore smoker group did not increase over time, which indicates a softening rather than a hardening of the smoking population (Lund et al., 2011). Figure 1 shows an updated version of the size of the hardcore smokers in the population over time. Both the non-hardcore group and the hardcore group declined over time.

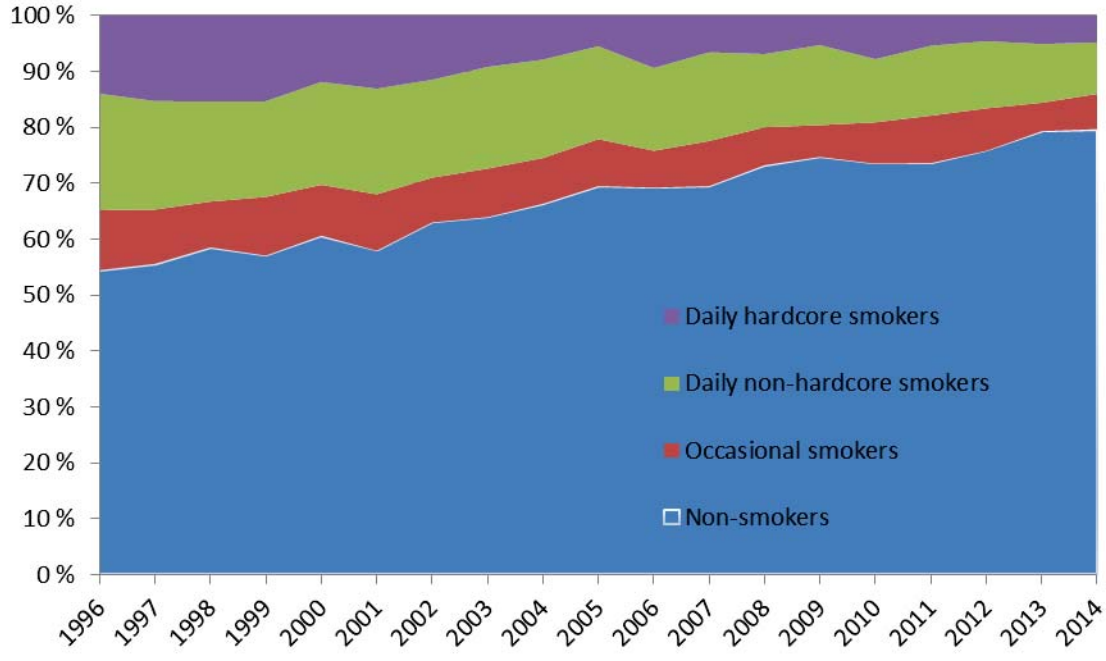

Figure 1. Percentage of daily hardcore smokers, daily non-hardcore smokers, occasional smokers and non-smokers in the population in Norway. Age group 25-74 years, 1996-2014. Source: SSB and SIRUS

2.2.1 Hardening conceptualized as increased social disadvantage

Successful quitting is harder for low SES smokers (Hiscock et al., 2012a). The evidence for a correlation between SES and smoking is strong (Hiscock et al., 2012b; Huisman et al., 2005; Lund & Lund, 2005; Reid et al., 2010; Schaap et al., 2008). In Norway, 30% of people with lower secondary education are daily smokers, whereas only 18% of people with an upper secondary education and 8% with lower or higher university degrees are daily smokers (Norwegian Institute for Alcohol and Drug Research, 2015). Social inequality in smoking-related mortality reflects the behavioural pattern of smoking, with a higher risk of mortality in the less-educated groups (Kulik et al., 2014). Studies of the population of smokers show a more risky smoking behavioural pattern for low SES smokers. Hardcore smokers are more likely to have low education or be socially deprived (Augustson & Marcus, 2004; Emery et al., 2000; Ferketich et al., 2009; Jarvis et al., 2003). Among Norwegian smokers, higher cigarette consumption, high cigarette dependence and lower motivation to quit were observed among less-educated smokers (paper 3). This finding may indicate that disparities in smoking behaviour will continue to increase in the future.

Increasing social inequality in smoking behaviour may be an alternative interpretation that supports the hardening hypothesis (Docherty & McNeill, 2012; Hughes, 2011). A decline in smoking prevalence has been observed for smokers from lower socio-economic backgrounds, but the rate of decline has been slower (Balbach et al., 2011; Chilcoat, 2009; Giskes et al., 2005). Research from 11 European countries indicates that socio-economic inequality in smoking cessation rates increased during the 1987–2012 period (Bosdriesz et al., 2015). The reason why lower socio-economic or socially disadvantaged smokers do not quit smoking at the same rate as more-affluent people is not fully understood.

In Norway, there is a downward trend for smoking in all educational groups, with no indication of a slower downward trend in the latest decade among the least educated (Norwegian Institute for Alcohol and Drug Research, 2015). Rather, it seems that the prevalence of daily smoking among men with the highest educational level has stalled (Norwegian Institute for Alcohol and Drug Research,

2015). There was a stronger decline in smoking rates among highly educated men relative to men with less education for cohorts born in the first part of the 20th century, but this difference has levelled off (Vedøy, 2014).

Studies that combine the social inequality perspective with components of hardcore smoking have found a greater rate of hardened smokers in low SES groups relative to high-SES groups (Clare et al., 2014). In a study by Clare et al. (2014), hardcore smoking declined among high-SES smokers, but not among low-SES smokers. In a study by Smith et al. (2014a), no evidence was found for hardening at the population level; instead, nicotine dependence declined in the 2002–2012 period. However, evidence for hardening among low-SES smokers was found, with increased severity for cigarette cravings (smoking to feel less irritable, higher degree of craving for cigarettes after a few hours) and a continuity dimension for nicotine dependence (Smith et al., 2014a). A study of Norwegian adolescents found a stronger relationship between daily smoking and social disadvantage in 2010 compared with 2002 (von Soest & Pedersen, 2014).

2.2.2 Hardening associated with increasing mental illness among smokers

Epidemiological studies have reported a strong association between different types of mental health diagnoses and smoking behaviour (Aubin et al., 2011). Changes in the association between smoking behaviour and mental problems over time would be an alternative interpretation of the hardening hypothesis, because smoking cessation is harder for people with mental problems. The decline in smoking prevalence for people with mental illness has been less than for those without mental illness (Le Cook et al., 2014). It has also been estimated that people with a past month mental disorder consumed approximately 44.3% of all cigarettes smoked by a nationally representative survey in the U.S. (Lasser et al., 2000). The prevalence of different types of depressive and anxiety disorders among current smokers increased from 1990 to 2001, which was a change that was significantly higher than for non-smokers in the same period (Goodwin et al., 2014). Mental illness has also been studied in relation to nicotine dependence. In the U.S., a decline in the severity of nicotine dependence was

greater for psychologically healthy smokers than it was for those in psychological distress, which suggests that hardening occurred for the smokers with mental health issues (Smith et al., 2014b).

Some studies have rejected hardening associated with mental illness. No evidence was found for an increased relationship between smoking and mental health or the use of other substances among adolescents in the 2002–2010 period (von Soest & Pedersen, 2014). A similar finding was reported in a study with adults, which indicated no changes in the relationship between psychological distress and smoking from 1997–2007 (Matthews & Gallo, 2011).

The latest contribution to this research area supports the hardening hypothesis, reporting that psychiatric vulnerability increases in smokers as smoking becomes less normative (Talati et al., 2016). The association between smoking and drug and alcohol use disorders has increased in more recently born cohorts, with dependent smokers being more at risk than non-dependent smokers. An increasing risk for comorbidity in recently born cohorts was found for attention-deficit hyperactivity disorder, bipolar disorder and antisocial personality disorder, but only among dependent smokers (Talati et al., 2016).

2.3 The non-smoking hegemony and denormalization of smoking

Tobacco control is an example of a health policy in which individuals are influenced by a powerful medical discourse that clearly specifies the correct behaviour: non-smoking. In this health discourse, those who place themselves at risk for diseases and/or premature death are seen as “contaminated” or even “degraded” individuals, and they are used as a reference point for what is abnormal and unacceptable (Broom, 2008). Lupton (1995) has critically analysed public health practices in contemporary society and conceptualized them as the *health imperative*. According to this imperative, smoking must be battled in the interest of public health, and smokers are seen as “weak and easily susceptible to external pressure” (Lupton, 1995).

Learning about the health hazards of smoking from the landmark Surgeon General’s report in 1964 was an important turning point for the status of tobacco smoking. Another important crossroad

was the 1986 acknowledgement of the health risks associated with passive smoking. It became clear that smokers were not only harming themselves; they were also polluting the environment and risking the health of others. From a situation in which the focus was on the individual smoker's health risk, cigarette smoking became everyone's business. Restrictions on cigarette smoking in public have become common in most western societies, including Norway. The establishment of non-smoking environments has been an important strategy to reduce smoking behaviour and a key aspect in a strategy that has been labelled *tobacco denormalization.*

The term *denormalization* was first used in relation to smoking to describe a comprehensive tobacco control program used in California. The goal of this change in social norms was to create a social milieu in which tobacco smoking was less desirable, less acceptable, and less accessible (California Department of Health Services, 1998). Since then, the concept of denormalization has been used in a variety of tobacco control policies and interventions that are believed to have influenced the social norms related to tobacco use (Hammond et al., 2006). Denormalization strategies can be grouped by their targets: the tobacco industry, tobacco products and smoking behaviour. Tobacco industry denormalization refers to tobacco control policies that focus on the activities of the tobacco industry. Such policies try to reverse the industry's effort to normalize tobacco behaviour, and they portray the tobacco industry as no ordinary industry and tobacco as no ordinary commodity (Chapman & Freeman, 2008; Mahood, 2002; Malone et al., 2012). Regulation of tobacco products mainly refers to price regulation, health information on tobacco products, age limits for purchasing tobacco products, tobacco content declaration, bans on additives (flavour) in tobacco products and tobacco display bans. Plain packaging may also be regarded as a social denormalization strategy because it reduces the symbolic content of cigarette packages and thereby weakens the marketing effects of tobacco packaging. The processes of *social* denormalization target the smoking behaviour itself and include such strategies as mass-mediated anti-smoking campaigns and the regulation of smoking in public places (Moore, 2005). The "out of sight, out of mind" strategy of banning smoking in specific outdoor settings is believed to help prevent young people from taking up smoking and to support

smokers who are trying to quit (Bloch & Shopland, 2000). Denormalization strategies have been regarded as successful, but they have not been able to eradicate smoking (Zhang et al., 2010). Based on the present definition of denormalizing tobacco use, as well as the Norwegian tobacco control strategies, it is clear that social denormalization strategies for smoking behaviour are strongly favoured in Norwegian society (Sæbø, 2012).

In the next section, hard-core smoking and continued smoking are elucidated from two main perspectives. First, sociologist Davis Ford's analysis of smoking, presented in metaphors of the "last smoker thesis" and the "poor smoker thesis", highlights the social inequality of smoking behaviour in contrast to the hegemony of tobacco control (Ford, 1999). Both neutralization of risk and smoker stigma will be discussed further. Second, a social resistance framework is presented that extends and complements existing theories on health inequalities.

3. Theoretical perspectives

Several explanations of and causes for smoking cigarettes have been identified in the literature (Wetterer & von Troschke, 1986). The explanations range from medical views about nicotine addiction, the psychosocial aspects of boredom, stress reduction and self-medication, enhanced cognitive performance, creativity and concentration to cultural aspects of identity, fellowship, enjoyment and pleasure. These explanations are still valid, but as the social context of smoking changes, additional perspectives may be legitimate. Thus, alternative explanations related to social inequality, power relations and mechanisms related to stigma and resistance may be relevant when smoking behaviour is both normatively and physically restricted.

3.1 The "poor smoker" thesis

In "The Poor Smokers", David Ford argues that smoking behaviour is not heading towards elimination, but towards a shifted social trajectory that he denotes as "the poor smokers" (Ford, 1999, p. 125). In his thesis, Ford uses a critical realist framework to examine the relationship between smoking and social disadvantage. My approach to the same "battle of smoking" in Norway is empirical; it is not anchored in critical realism. However, Ford's philosophical analysis and perspective on the "battle of smoking" provides some interesting perspectives that are pertinent to the composition of smokers in Norway.

Ford criticizes the idea of the "last smoker", which is parallel to the current discourse on the endgame of tobacco use. According to Ford, the "last smoker" thesis is the belief that smoking rates will continue to decline, and with the correct governmental policy, smoking behaviour will be eradicated in the future. Ford rejects the "last smoker" thesis based on recent empirical evidence of the increasing number of cigarette smokers globally, indications that smoking cessation is stalling and the social inequality in smoking behaviour. The main argument against the "last smoker" thesis concerns the socio-economic divide between smokers and non-smokers; Ford introduces "the last

poor smoker" as a more realistic thesis. Social inequality in smoking behaviour is the biggest threat to endgame ideas. Smoking has become a poverty phenomenon and "the last smoker", or endgame, will not materialize under the current social conditions. He states that "the social polarising of smoking behaviour mirrors similar social processes already active in the contemporary political economy" (Ford, 2001).

There are several mechanisms in play in the constitution of the "poor smoker". Anti-smoking policies have implemented several strategies to combat smoking, and these strategies have been successful in reducing smoking prevalence, but they have failed to eradicate smoking. Instead, anti-smoking policies have been disproportionately targeted at socially disadvantaged groups. Ford argues that "these tobacco specific policy initiatives are the primary causal agents responsible for the formation of the socio-economic divide" (Ford, 1999, p. 139). Although tobacco policies are well intentioned to prevent smoking-related illnesses and deaths, it is possible that they in some cases intensify the social pathology they purport to relieve. There are three major formative mechanisms for this divide: health education about the risks of smoking; the non-smoking environment in which smoking is stigmatized has become the norm; and tobacco taxation. These mechanisms are intended to motivate smokers to quit, but they do not act with equal force on social groups (Ford, 1999, p. 139). Ford's formative mechanisms are comparable to the concept of "tobacco denormalization" and the development of new tobacco control strategies that are discussed in relation to the tobacco endgame. I will now outline two potential mechanisms at play that may explain both how continued smoking is possible despite its negative connotations and the role of smoker stigma.

3.2. Neutralization of risk

Smokers who do not reach society's goal of smoking cessation may experience justification problems and cognitive dissonance (Fotuhi et al., 2013). Cognitive dissonance theory assumes that by justifying our actions to ourselves, the felt discomfort is reduced (Festinger, 1962). If we assume that smokers do not deliberately want to harm themselves, then continuing to smoke will lead to a conflict between

their attitude and their behaviour. This conflict is disturbing for the smoker, especially in a social context in which non-smoking information constantly reminds the smoker of this discrepancy. As shown in one of the articles for this thesis, smokers experience negative emotions such as regret, anger and social disapproval of their smoking behaviour (paper 2). Thus, this situation motivates smokers to develop strategies to reduce their dissonance.

Different types of neutralization techniques are seen as justifications for deviant behaviour, but they are not seen as valid by the society at large (Sykes & Matza, 1957). One such neutralization technique is risk denial (Peretti-Watel et al., 2007; Peretti-Watel & Moatti, 2006). Several studies demonstrate that smokers underestimate or deny the health risks associated with smoking (Weinstein, 1998, 2001). How smokers evaluate the health risks of smoking can be separated into absolute risk (their own perceived susceptibility) and comparative risk (their own risk relative to that of others) (Kaufman et al., 2015).

An association between risk perception and the intention to quit smoking has been found in several studies, indicating that a greater awareness of the health risks of smoking was associated with the intention to quit smoking (Savoy et al., 2014; Williams et al., 2011). In Norway, the willingness to try snus to quit smoking is significantly higher for those who, consistent with scientific evidence, evaluate the health risk of snus as far less than that of cigarettes (Lund, 2012). The tendency to underestimate the personal health risks of smoking has been found among smokers of low SES, materially deprived smokers, and those who mention the Internet and relatives as their main sources of information about cancer (Peretti-Watel et al., 2014; Siahpush et al., 2006). An association between risk perception and educational level has also been observed using a general measure of risk (Jusot et al., 2013).

In a qualitative study from Finland, the authors identified five justifying themes that people used to address the health risks associated with smoking behaviour (Heikkinen et al., 2010). In addition to a belief in reduced personal risk of smoking, the participants highlighted moderate smoking as less harmful, and they used counter-evidence such as their own good health or examples of friends and

relatives who smoked their whole lives without any negative health consequences. Compensatory behaviours such as exercising were mentioned as a neutralizing strategy, in addition to evaluating smoking as less risky than other unhealthy behaviours (Heikkinen et al., 2010). Referring to the survival of life-long smokers as an important component of smokers' justifications has even been thought to outweigh the impact of tobacco control measures (Heikkinen et al., 2010).

The denial of responsibility is an alternative neutralization technique (Sykes & Matza, 1957). Sykes and Matzas' theory was developed in relation to juvenile delinquents, who used the denial of responsibility as a neutralizing technique. A deviant action could be justified as something outside of the adolescent's control, such as peer pressure or deprived neighbourhood conditions (Sykes & Matza, 1957). The denial of responsibility may also be a means to reducing cognitive dissonance (Gosling, 2006). With respect to smoking, some smokers may regard nicotine addiction as a force outside of their control. Smokers become "victims of addiction" with reduced autonomy. This perspective is supported from a biomedical point of view, which gives nicotine dependence diagnostic status. However, the lay perspective of addiction indicates that the responsibility is placed on the addicted person (Rise et al., 2014).

Credibility, attractiveness and power are seen important prerequisites for successful anti-smoking messages (McGuire, 2001). If the sources of anti-smoking messages have these characteristics, the messages are assumed to be more persuasive through the process of internalization, identification and compliance (McGuire, 2001). If smokers were to question some of these attributes, the potential effect of anti-smoking messages would be weakened. For example, if smokers felt that a message was "blaming the victim" by focusing on individual responsibility for health, or if they perceived a moralistic agenda rather than scientific arguments as the basis for the health message, they would disavow the message, and thereby neutralize the risk.

3.3 Stigma

The denormalization strategies used in tobacco control policies have been criticized for stigmatizing smokers, which has been described as an unintended consequence of tobacco control (Broom, 2008). Proponents of denormalization strategies for tobacco control emphasize that norm change is the focus; their strategies are intended to establish non-smoking as a norm (Zhang et al., 2010). The problem of smoking stigma has been addressed in tobacco research in recent decades (Bayer, 2008; Bayer & Stuber, 2006). This stigma has been seen as moral dilemma in public health, but it has also been seen as a potential social mechanism in denormalization that leads to behavioural change (Kim & Shanahan, 2003). Stigma is hypothesized to have a strong normative function, especially under conditions that are seemingly controllable (Evans-Polce et al., 2015).

Stigma is a multifaceted phenomenon that is defined and expressed in different ways. Many authors cite Ervin Goffman's definition of stigma as an "attribute that is deeply discrediting" (Goffman, 1963). Goffman identifies three different types of stigma: physical deformities, blemishes of individual character, and differences based on religion, gender or ethnicity (Goffman, 1963). It is the blemishes in an individual's character that are pertinent to smoking behaviour, such as the perceived "weakness of the will", risk denial and addiction to smoking, that may bring stigma processes to the surface.

Several recently published articles have suggested that the increased stigmatization of smokers is a result of prevention strategies that rely on the denormalization of smoking behaviour (Bell et al.,2010; Sæbø, 2012). There is also evidence that non-smokers perceive smokers less favourably, which indicates that smokers have become a stigmatized group (Gibson, 1997). The concern is for the increasing stigmatization of smokers and the vulnerability they experience because of marginalization in other aspects of social life. The strategies that use tobacco denormalization appear to contribute to a social transformation that involves the active stigmatization of smokers (Bayer, 2008; Bayer & Stuber, 2006). Researchers have called for an examination of the ethical implications of this prevention strategy (Bell et al., 2010).

3.4 Resistance theory

The concept of resistance is relevant to the investigation of smoking with respect to the "resistance to quitting" and the low status of smoking. The theory of resistance has become fashionable in many disciplines, but is a difficult concept to address because there is no consensus about how to define and understand resistance (Hollander & Einwohner, 2004). The disagreements concerns whether resistance needs to be recognized as resistance and whether an act needs to be intentional to be resistance (Hollander & Einwohner, 2004). Definitions of resistance in the literature tend to be more specific and directional than is justified, and its applicability to smoking behaviour may not be straight forward, as smoking is a complex behaviour associated with ambivalence. I begin with resistance in social psychology and the concept of psychological reactance. Next, I present the social resistance framework, linking sociology, public health and inequality. The concept of everyday resistance is central and will be outlined.

3.4.1 Psychological reactance

In social psychology, resistance is understood as psychological reactance, as outlined by Brehm (1966). Psychological reactance is a motivational state directed towards restoring a threatened freedom of action. If a person's possibilities for freely chosen actions are restricted, the individual will experience an increased desire for the eliminated or threatened behaviours. Theoretically, what is most important for the individual is to restore the freedom rather than to be able to choose the action that was eliminated or threatened (Worchel & Brehm, 1971). The degree of reactance is determined by how important the person perceives his/her freedom to be, the proportion of freedom eliminated and the degree of pressure to comply (Worchel & Brehm, 1971).

Psychological reactance plays a role in the initiation of smoking among adolescents (Grandpre et al., 2003; Miller et al., 2006). Studies on psychological reactance and adult smoking are sparse, and mixed results have been reported for (among other things) the influence of graphic cigarette warnings (Blanton et al., 2014).

A potential problem with strong anti-smoking messages such as fear messages or with the repetition of many different forms of persuasive attacks is that they may increase smokers' reactance and resistance, ultimately leading to the opposite of the intended result. It is a concern that smokers are worn out by the health imperative of non-smoking as the desirable behaviour. One study indicated a "boomerang effect" in which exposure to graphic cigarette warnings increased intentions to smoke (Sabbane et al., 2009). However, a meta-analysis of studies of graphic cigarette warnings rejected the "boomerang effect" (Noar et al., 2015).

3.4.2 Everyday resistance

Despite the various definitions of resistance, scholars of resistance theory agree that resistance involves some active cognitive, verbal or physical behaviour that opposes something (Hollander & Einwohner, 2004). However, there is great disagreement about whether the act must be intended as resistance or not. In a review of resistance theory literature, the authors suggested that researchers have addressed the question of an actor's intention by saying that: intention is the key to classifying an act as resistant; assessing an actor's intention is difficult or impossible; and that intentions are not central in the understanding of resistance (Hollander & Einwohner, 2004). An intentionally resistant act may be seen as a direct response to power relations in society, whereas unintentional resistance is not directed towards an ideological struggle; it is motivated by interests and desires that are outside of the power structure (Rose, 2002).

Everyday resistance is an individual act that is part of ordinary, everyday life, and it is integrated into the routines of the actor's way of life. Vinthagen and Johansson (2013) suggested a detailed definition of everyday resistance. First, everyday resistance is an act that is done in a regular way. It may occasionally be politically intended, but typically, it is habitual or semi-conscious. Resistance is not a characteristic of the individual; it is about a specific action in a specific context.

Second, everyday resistance is non-dramatic, non-confrontational or non-recognized, but it has the potential to undermine some power without revealing itself (Vinthagen and Johansson, 2013). This perspective stands in contrast to Hollander and Einwohner's (2004) view that resistance needs to

be recognized as resistance by observers and the potential targets of the acts. From this perspective, health authorities, anti-smoking activists and the public in general need to recognize smoking as a resistant act.

To my knowledge, there are no studies on non-smokers' understanding of smoking as an act of resistance. However, some studies report that non-smokers have more negative attitudes about smokers compared to non-smokers, and are less willing to interact with smokers (Bleda et al., 1977; Chambliss et al., 2006). Non-smokers also believe that smoking plays a greater role in the smoker's sense of self, that smokers are more dependent and that they are less motivated to quit smoking than they say (Dillard et al., 2013). Research also indicates that non-smokers interpret smoking as irrational and assume smokers have personality flaws (McCool et al., 2013).

Third, everyday resistance is done by individuals or small groups without formal leadership or organization, but it is typically encouraged by some subcultural attitude or "hidden transcript" (Vinthagen & Johansson, 2013). The social context of smoking is essential for the development of subcultural pro-smoking attitudes, and the key to understand diverse sources of resistance to tobacco control (Poland et al., 2006). The spatial segregation of disadvantaged populations may produce "smoking islands" that can reinforce rather than discourage continued smoking (Thompson et al., 2007).

3.4.3 A social resistance framework

A sociological approach to resistance is the social resistance framework outlined by Factor and colleagues (Factor et al., 2011). The social resistance framework is based on the idea that power relations in society encourage members of non-dominant minority groups to actively engage in everyday resistance practices, including various unhealthy behaviours (Factor et al., 2011). Examples of non-dominant minority groups include ethnic minorities, socially and/or economically disadvantaged groups. From this perspective, everyday resistance refers to individual and "non-organized" resistance, as opposed to organized resistance, such as in social movements. This theoretical perspective tries to integrate structural and agency level explanations.

According to the social resistance framework, unhealthy behaviour develops through two main paths, one of which is associated with power relations and the other with collective identity. The first path is related to power relations in society and the individual's lack of attachment to the society at large. By being in the minority, feelings of alienation, powerlessness and reduced attachment to the society at large lead to a "hidden transcript" of everyday resistance (Factor et al., 2011). This perspective relates to the macro-structural explanations of health inequality and to social conditions as fundamental causes of risky health behaviour and diseases (Cockerham, 2005; Hatzenbuehler et al., 2013). When non-dominant groups engage in risky behaviours, they signal their willingness and ability to defy the dominant groups and their hegemony (Factor et al., 2011). This theory distinguished between coping and resistance, with coping being related to solving personal problems, such as smoking to relieve stress, whereas resistance is an active means of expressing dissatisfaction with social and economic circumstances.

The second path to unhealthy behaviour involves the development of a collective identity in the non-dominant group in opposition to that of the dominant group (Factor et al., 2011). This implies a pressure to reject the attitudes and behaviours of the dominant group, not unlike subcultures (Sandberg, 2013). If non-smoking and non-smoking norms are perceived by the minority group to characterize the dominant group, the minority would avoid quitting smoking and reject the laws or social norms of the majority group. Although smokers have complied with certain regulations such as bans on smoking in the hospitality industry, paper 4 in the present thesis illustrates that smokers' resistance to further smoking regulations is high.

Smoking has been found to have a symbolic significance regarding the reflexive construction of the self and identity formation (Denscombe, 2001, Scheffels, 2009). The act of smoking (and the risk involved) indicates control over one's destiny, marking the smoker as special and distinguishing him/her from others (Denscombe, 2001). To a large extent, people remember and define other people by distinctive traits rather than common attributes, and they take notice of those who violate social norms. Thus, the effect of "being special" may increase as norms changes.

4. Data and methods

The present thesis uses two types of data sources. The first data source is the Norwegian Tobacco Survey, which obtains nationally representative data from the adult population in Norway, collected by Statistics Norway (SSB). Data from this source were used in papers 1 and 3. The questionnaire that contains the smoking variables used is presented in Appendix 1. The other data come from two Internet-based surveys and were collected by an independent research agency, Ipsos MMI. Data from this source were used in papers 2 and 4. These questionnaires are presented in Appendices 2 and 3.

4.1 The Norwegian Tobacco Survey

Since 1973, SSB has collected information from a representative sample of 16–79-year-old Norwegian residents annually. The quarterly survey is cross-sectional, and it monitors smoking prevalence and snus use. The fourth-quarter survey each year (in November) constitutes the main survey, with a range of questions such as age of first tobacco use, frequency of use, consumption level, measures of nicotine dependence and attempts to quit. Most of the questions are asked each year, which makes it possible to track changes over time. Information about education is collected from register databases. Since 1992, the tobacco use survey has been a part of an omnibus survey, and since 2004, it has been a part of a survey on Norwegians travel habits.

Each quarter, 2,000 individuals are selected to be interviewed from the SSB's population statistics system (BeReg), the main data source of which is the National Registry (Statistics Norway, 2014). Data collection is done by telephone using computer-assisted telephone interview (CATI). Non-responders fall into three categories: those who could not be reach by telephone, those who were not able to attend due to sickness or language barriers, and those who did not want to participate. The first type of non-responders is the main cause of missing data and constituted approximately 50% of all the missing data (Statistics Norway, 2014).

All individuals invited to participate receive a letter from SSB in advance. The letter contains information about voluntary participation, the possibility of withdrawing from the study at any time and having one's data deleted. In addition to information about the Statistical Act and the Data Protection Act that the study is subject to, the letter indicates that the respondent's personal information is deleted after one year. Personal information is not accessible in the data set available for researchers.

There has been some variation in the response rate over the last 20 years, declining from 70% at the beginning of 1990s to 56% at the end of the 1990s. Since 2000, the response rate has been stable at around 60% (Vedøy, 2015). Reduced response rates have become a common problem in general population surveys, and they do not necessarily indicate a non-response bias (Johnson, 2014). It is the degree of difference between respondents and non-respondents on the variables of interest that defines bias. Of concern regarding the monitoring of cigarette smoking is the presumed high rate of smoking among persons with mental illness, homeless persons and those who are hospitalized (Johnson, 2014). Because smoking behaviour is strongly related to educational level, it is concerning if there is a bias on educational level. The missing data for those who declined to participate and those not met for interviews was somewhat higher in the low-education groups than in the high-education groups. Thus, it is questionable whether credible prevalence estimates for smoking are possible without correcting for this bias. Monitoring for smoking behaviour may also cause a social desirability bias. This will be discussed later in this chapter.

4.2 Internet-based surveys

The data used in papers 2 and 4 stem from Internet panels of more than 62,000 Norwegians collected by an independent research agency (Ipsos, MMI). The recruitment of Internet panellists was conducted using a probability sample, and new panellists are recruited continuously. Self-recruitment to the panel is not possible. The sample used in paper 2 consisted of tobacco users only, and was a specialty panel, which refers to a group of people who are selected based on special criteria (Baker, 2010). An invitation

to participate in an evaluation of an anti-smoking campaign was sent to people who had indicated in previous surveys that they were smokers or snus users. This data set also included tobacco users who were recruited from a postal database. The age group of the Internet panel and the postal database was 18 years and above, and the number of tobacco users in the study sample was 4,852 men and women.

In paper 4, the Internet panel was used to invite members to participate in a survey on attitudes about tobacco control policies. A total number of 4,291 subjects were recruited from the panel, and 1,252 participants less than 29 years old were recruited directly from cellphone lists. A total of 5,543 respondents participated in the survey. Thus, a mixed-mode design was used, with multiple modes of data collection, including CATI, Internet-based and mobile platforms (Dillman et al., 2009).

Three serially related stages are regarded as important in online panels, access to Internet/e-mail, willingness to participate and actual participation (Couper, 2000). Access to computers, the Internet and cellphones is high in Norway (Statistics Norway, 2015). Approximately 50% of the Ipsos panel members consented to further participation. There are many steps from the database of panel members to the analytical sample, and the number of non-responses can become substantial in this process. The question is whether this nonresponse is systematic or random. Studies analysing sample composition bias in probability samples versus Internet panels have found substantial differences in age and education, with younger and more educated people over-represented in Internet panels (Bosnjak et al., 2013). Consistent with this research, highly educated people were over-represented in the Internet sample for this thesis (Lund et al., 2014).

There are many different types of Internet-surveys, and the data used here are consistent with "pre-recruited panels of Internet users" (Couper, 2000). Non-response is the most important concern for this type of Internet survey. Because the objective of paper 2 was to compare groups of tobacco users, make comparisons between different users and within-group differences, a potential lack of representativeness in the Internet data is not seen as a problem here. In paper 4 on opinions about novel tobacco control policies, caution must be taken regarding representativeness.

Despite the problem with the generalizability of Internet-based data, this approach has several advantages. By using Internet panels, it is possible to accumulate a large volume of responses in a short period of time and at a low cost. Internet-surveys make comparative research across countries more feasible, and they also make it possible to use visual and interactive technologies. This is useful for evaluating anti-smoking campaigns or cigarette package designs, as respondents can be shown video clips and pictures. There are also indications that Internet-based surveys may be advantageous when studying potential stigmatizing behaviours. Behaviours such as cigarette smoking may elicit a social desirability bias in surveys, especially when respondents must interact directly with an interviewer, as in face-to-face or telephone interviews (Crutzen & Goritz, 2010).

4.3 Content validity

Validity concerns whether a variable measures the true theoretical meaning of what it is supposed to measure. For the empirical studies in this thesis, I used established and validated measures, such as the time to first cigarette in the morning as a measure of cigarette dependence in paper 3 (Borland et al., 2010). The measure of perception of personal tobacco use were mainly derived from a battery of psychological assessments of self-evaluative emotions embedded in social cognitive theory (Dijkstra & Buunk, 2008).

The hardcore construct is a more complex measure, as outlined in section 1.2. Questions have been raised regarding whether the hardcore smoker concept is appropriate to describe smokers who do not want to or are unable to quit. This critique is mainly based on the absence of a consensus about how to define the group and the variation in size depending upon which definition is used (Costa et al., 2010). The predictive validity of the hardcore construct has been confirmed in one study (Ip et al., 2012). A limitation of the hardcore construct is that it does not provide any information about the cause of hardcore smoking, such as why smokers do not want to quit, whether or not they are able to quit, or how these two components interact. In addition, the hardcore smoker concept may be

inappropriate for the smokers themselves in the sense that most hardcore smokers may not identify as such.

4.3.1 Social desirability bias in monitoring smoking behaviour

The social desirability bias hypothesis says that because individuals tend to answer what they think is expected of them, or because of specific social norms, the answers they give in surveys may have low validity. There is a tendency to over-report socially *desirable* actions, such as voting and exercising, and to under-report socially *undesirable* behaviours, such as alcohol and drug use (Johnson, 2014; Krumpal, 2013). Research indicates that under-reporting increases with the perceived stigma of the substance (Johnson, 2014). Being smoke-free has now become the normative behaviour, and there are reports that smokers experience stigma (Evans-Polce et al., 2015). An indication that smokers under-report smoking behaviour and/or their cigarette consumption level is suggested by a discrepancy between self-reported consumption and the registered sales statistics for smoking tobacco (Vedøy, 2015). However, studies on the validity of self-reported smoking reports high degree of accurate estimates when compared to objective (biological) measures of nicotine (Patrick et al., 1994; Wong et al., 2012). In another study, disadvantaged people attending a community service organization reported their smoking status very accurately (Bryant et al., 2011).

4.4 Data analysis

4.4.1 Scale variables: Between and within design

The analyses of the perception of tobacco use (paper 2) and on opinions towards tobacco control policies (paper 4) were based on scale variables ranging from 1 to 5. In article 2, differences between exclusive smokers and exclusive snus users' perceptions of their own tobacco use were analysed. A within groups design was used to analyse the tobacco use of people who used both cigarettes and snus. Descriptive statistics such as means and standard deviations were reported, as were statistics for differences using *t*-tests (dependent and independent t-tests) and chi-square statistics for group

differences. The significance level was defined as $p < 0.05$. Cohen's *d* was used to measure effect sizes for differences between means in paper 2 (Cohen, 1992). Cohen's *d* is calculated as the differences between the means, divided by the pooled standard deviation. Effect size provides information in addition to significance testing, and values above 0.8 are regarded as high. In addition, an analysis of covariance was computed to test whether the inclusion of age and sex influenced the differences in mean scores between exclusive smokers and exclusive snus users.

4.4.2 Principal component analysis

I used principal component analysis (PCA) to investigate the internal structure of the dataset with multiple scale variables in paper 2. PCA is an exploratory technique that is used to detect underlying patterns in a data set. It is useful as a data-reduction technique, were multiple variables are combined into components. To increase interpretability, rotation methods are available. In orthogonal rotation, the components are assumed to be uncorrelated, whereas oblique rotation is used when the components are assumed to be correlated (Tabachnick & Fidell, 2007). In paper 2, we used oblimin rotation, which assumes that the components are correlated. Eigenvalues above 1.0 were used to identify components, and interpretation of the component was based on the highest score loadings (se Appendix 2). The first identified component accounts for as much of the variance as possible, and each successive component explains progressively smaller portions of the variance. All of the components identified were given names to illustrate the underlying dimensions.

The internal consistency of each component was tested using Cronbach's alpha, which is a widely used measure of the reliability of scales and indexes. The value ranges between 0 and 1, and values from 0.70–0.95 are considered acceptable (Tavakol & Dennick, 2011). Internal consistency describes the extent to which all the variables in an index measure the same concept. The Cronbach's alpha have some limitations. The score depends upon the correlation between the variables included in the index, in addition to the number of variables included. The higher the correlation and/or number of variables, the higher the Cronbach's alpha will be. This measure is considered to be especially sensitive to the number of variables included. The number of items in the components used in paper

2 was not considered to be a threat to reliability. Another limitation of Cronbach's alpha is that it only measures the intercorrelations among the variables included in the model, not homogeneity, which means that there is only one latent dimension to explain the correlation (Barbaranelli et al., 2015).

4.4.3 Categorical variables: Regression analysis

Multivariate regression analysis was used to investigate the association between the outcome of interest (variables measuring smoking behaviour and attitudes) and socio-demographic variables to calculate the strength of the association when controlling for other variables. The correlations between dependent and independent variables in regression analyses of cross-sectional data are associations; they are not to be understood as causal relationships. Logistic regression analyses were used in papers 1 and 3. Logistic regression is used for binary outcome variables, and it is often used in tobacco research (smoking vs. non-smoking). Assumptions about normally distributed error terms, the absence of heteroscedasticity and autocorrelation are not required for logistic regression as they are for linear (ordinary least squares) regression. However, logistic regression is sensitive to extremely high correlations among the independent variables, and a poorly designed model (relevant variables omitted) gives parameter estimates that may change in magnitude or even direction (Tabachnick & Fidell, 2007). Logistic regression uses maximum-likelihood estimation, which refers to maximizing the likelihood that the observed values for the dependent variable are predicted by the observed values for the independent variables.

In paper 1, the outcome (or dependent variable) was smoking status (hardcore vs. non-hardcore). In paper 3, the dependent variables were cigarette consumption (high vs. low), cigarette dependence (high vs. low) and intention to quit smoking (no vs. yes). The results are presented as odds ratios (OR), a measure of the probability of an event occurring divided by the probability that an event is not occurring. In the multivariate models, adjusted OR are presented. In the multivariate models, all of the independent variables were entered simultaneously. The analyses reported in papers 1, 2 and 4 were done using SPSS. For paper 3, the analyses was done in STATA.

Multinomial regression was used in paper 3 to analyse smoking status. The dependent or outcome variable had three categories: current smokers, former smokers and never smokers (reference category). The multinomial regression model used K-1 equations. In this case, there were two equations, one to model the relative risk ratio (RRR) for current vs. never smokers and the other to model former vs. never smokers. Control variables were gender, age, survey year and number of members in the household. In paper 3, I used the margins command in STATA to present predicted probabilities (margins) and differences in predicted probabilities (marginal effects) from the logistic regression analysis (Williams, 2012). Marginal effects show how the outcome changes for each change in the categorical independent variable. The marginal effects are estimated as average marginal effects; therefore, the other variables in the model were used *as observed* for each case (default). Predicted probabilities for each combined group of education and income using the margins command (education # income) and the delta method were used to examine the statistical significance of group comparisons.

Both the OR and the RRR are relative measures, meaning that the baseline value is of importance. Even though the relative risk of being a hardcore smoker is significantly higher among low SES groups, it is important to remember that the occurrence of hardcore smoking in the general population is low.

5. Summary of the research papers

Paper 1 (Lund et al., 2011) investigates the relative number of hardcore smokers over time. A definition of hard-core smoker was constructed using cross-sectional data with identical variables for each year. All daily smokers who had made no attempt to quit during the previous year, did not intend to quit in the next six months, and believed that they would still be smoking in five years were defined as hardcore smokers. The aim of the study was to investigate relative changes in the proportion of hardcore smokers in the 1996–2009 period. The finding that the relative size of the hardcore smoker group did not increase does not support the hardening hypothesis. Rather, a "softening" of the smoking population may be the case. However, the definition of the hardcore smokers is of importance. For instance, unlike some other studies in this field, we did not include a measure of nicotine dependence as part of the hardcore construct.

In paper 2 (Lund et al., 2014), we investigated tobacco users' perceptions of their behaviour. We compared exclusive users of snus with exclusive users of cigarettes on different self-evaluative aspects such as emotions, morality, social disapproval and health benefits of quitting. In addition, we analysed dual users regarding their snus and cigarette use on the same evaluative measures. The aim of the study was to investigate whether the two tobacco user groups differed in their perceptions. We found that smokers have more negative emotions about and experience more social disapproval towards their tobacco use than do snus users. Dual users exhibited the same pattern. These findings indicate a greater degree of self-stigma among smokers relative to snus users.

In paper 3 (Lund, 2015), I investigated social inequality in smoking status and behaviour. The aim of this paper was to examine the association between SES (as measured by education and income) and the components of hardcore smoking: high cigarette consumption, cigarette dependence and intention to quit. Using a pool of representative data on smoking behaviour (2007–2012), I found the expected strong relationship between education and income on one hand and smoking status on the other hand. Among smokers, low education was associated with all three of the components of

hardcore smoking. These findings confirm the social inequality of smoking status, and inequality in smoking behaviour among smokers.

Paper 4 (Lund 2016, submitted) explores opinions towards proposed tobacco control strategies. Health government are concerned for a plateauing in the smoking rates, and to secure continuation in the downward trend in smoking prevalence, new tobacco control strategies have been proposed. The aim of the study was to explore opinions about 16 proposed tobacco control strategies, including smokers' opposition to the proposals. The results are discussed in relation to justification of new tobacco control measures, and the need for support among smokers for implementation. In the total sample, there was some support for regulating smoking in specific outdoor settings. Smokers opposed all of the proposed strategies except banning smoking in cars carrying children. To some extent, smokers seemed to accept regulation that protected others from health risk, but defended their right to smoke at outdoor seating's at bars and restaurants and in parks. Smokers also oppose the proposal of banning the sales of cigarettes in ten years. Support from smokers may be important on tobacco control areas that aim to denormalize smoking, and where enforcement is more complex.

6. Discussion

6.1 Hardcore smokers and the question of resistance

The concept of hardcore smokers represents an attempt to identify smokers who are not willing or not able to quit smoking. In addition, there are smokers who do not fall into the category of hardcore, but who struggles with nicotine addiction, and have ambivalent attitudes towards their smoking behaviour, with both positive and negative forces present (Humphreys et al., 2011; Larsen & Cohen, 2009; Lipkus et al., 2001). Among 25–74-year-old Norwegians, half of all occasional smokers (N = 256) and three quarters of daily smokers (N = 652) have tried to quit smoking at least once. When smokers are asked (on a five-point Likert scale) how strong their interest is in quitting, 28% have no interest, 24% are neutral and 46% say they are strongly interested. Among smokers with a strong interest in quitting, 44% have tried to quit in the last year (unpublished data from Statistics Norway for 2012–2015). These results illustrate the ambivalence of smokers. Even though the identified group of hardcore smokers represents a minority of smokers, this does not mean that it will be easy to persuade the remaining non-hardcore smokers to quit.

Tobacco denormalization and the associated smoker stigma may also buffer a smoker's self-esteem and strengthen (rather than weaken) a smoker's identity. Smokers may feel overwhelmed with information about health risks of smoking, the relative risks between different tobacco products, the most effective smoking cessation method and whether or not e-cigarettes are safe. This may lead to information overload, a "boomerang" effect, were the opposite of the intended effect of tobacco control occurs, were smokers becomes immune to anti-smoking messages. Thus, smokers may choose the path of "least resistance" and comply with tobacco regulations, but then continue to smoke. They are the holdout smokers who do not conform to a non-smoking behaviour. After all, people who continue to smoke in the current denormalization climate could be conceptualized as people who are adequately informed about the health risks and therefore have given their informed consent to maintain their smoking habit. Smokers are also willing to pay the high price of cigarettes, and they

show high degree of compliance to non-smoking norms and regulations by smoking in designated areas and not disturbing non-smokers.

The concept of resistance is of specific interest in the investigation of smoking behaviour, as it is a socially condemned, low-status behaviour. The social resistance framework uses both structural and individual level explanations, combining power relations and inequality in society with acts of everyday resistance, including unhealthy and risky behaviours such as smoking. In a pilot study, Factor and his colleagues (Factor et al., 2013) evaluated a questionnaire for testing the social resistance framework and found some indication for the explanatory power of social resistance for unhealthy behaviours in a minority group. Among African-American (non-dominant minority group), social resistance showed a significant correlation with smoking and alcohol consumption (Factor et al., 2013).

The main goal of tobacco control advocates is to reduce the health burden of cigarette smoking by persuading established smokers to quit and preventing youth from taking up the habit. Many smokers have adopted the non-smoking norm and tries to quit, or they hide their smoking. Smokers who do not follow this health imperative undermines the power of public health, and their continued smoking may be understood as an act of resistance. Smokers themselves may turn to “self-branding”, refusing to be victims of smoker’s stigma and resist to the non-smoking norm (Poland & Holmes, 2015).

Smokers seem to be well aware that they have lost the “battle over smoking” (Ford, 1999). They comply with existing tobacco regulations, but they do not necessarily accept them. It may also be that compliance with smoking bans is a strategy to protect themselves, minimize the subordination and stigma, and win acceptance among non-smokers and health authorities. It is a way to avoid attention.

Resistance is not necessarily directed at institutionalized power, but it may well be a struggle for autonomy (Krange & Skogen, 2011). Smoking is an individual and a social activity, but its symbolic meaning is changing. The act of smoking has undergone a change in status from being a behaviour of the rich and wealthy to a behaviour that symbolizes low SES and marginalization (Lund, 1996). The social meaning of smoking may also be devalued by the increasing restrictions on smoking in public

places. The collective aspect of smoking is changing, and its disappearance in some arenas is potentially transforming smoking into an isolated and individual activity (Parry et al., 2002).

Today, there is no form of organized resistance among smokers. Pro-smoking arguments have gradually disappeared as anti-smoking norms have become stronger. Fear of punishment, stigma or social ostracism may prevent smokers from openly expressing their dissatisfaction with smoking regulations. The only example of collective organization among smokers (which may also be interpreted as a form of social movement or resistance and political activism) is the vaping community. Users of electronic cigarettes (e-cigarettes), or *vapers*, are mainly former smokers and smokers who use e-cigarettes as a harm reduction strategy. Users of e-cigarettes include smokers who would like to quit, but also smokers with no express desire to stop using tobacco.

More research is needed to determine whether the theoretical idea of everyday resistance is relevant to the investigation of smoking behaviour. This may be done by using the social resistance framework and the additional scales developed for measuring everyday discrimination, alienation, in-group identity and social resistance (Factor et al., 2011, 2013). In addition, there is a need for qualitative research in this area to gain insights into smokers' own understanding of why they continue to smoke and whether resistance is a meaningful concept in this case. According to Poland, the social meaning of smoking in the context of peoples everyday life is underplayed (Poland et al., 2006).

6.2 Denormalization and stigma

Smokers evaluate their own tobacco use more negatively than snus users do, and many smokers report experiencing social disapproval of their smoking. Several studies indicate that smoking has become stigmatized (Farrimond & Joffe, 2006; Graham, 2012; Ritchie et al., 2010; Stuber et al., 2008). The consequences of smokers' "spoiled" identity are not clear. When an identity is "spoiled", alternative strategies develop (Goffman, 1963). Goffman (1963) shows how individuals with discredited identities take on the responsibility of managing interactions to prevent discomfort in others and at the same time build their own self-worth. Such a strategy for smokers would involve negotiating their spoiled

identity with non-smokers to facilitate smooth interactions by complying with the non-smoking norm and concealing their stigmatized status by refraining from smoking around non-smokers. Smokers have complied with smoking regulations such as the ban on smoking that was implemented in the hospitality industry in 2004 (Lund, 2006). Whether smokers will continue to comply with increasing restrictions on smoking behaviour is unclear. The findings in paper 4 question smokers' willingness to conform to increased regulations.

There is an ongoing debate among tobacco and public health researchers regarding the potential unintended consequences of tobacco denormalization strategies, including whether or not they contribute to the stigma of smoking and the potential impact such a stigma has on smokers. On the one hand, tobacco denormalization strategies and the subsequent smoking stigma may have helped to reduce the prevalence of smoking. On the other hand, a concern has been raised that smokers may feel increased stress, worthlessness and loss of dignity. Social denormalization strategies that make smoking less desirable, acceptable and accessible have prompted an ethical debate in tobacco research. From a public health perspective, the argument is that individual freedom must give way to some degree for the sake of better public health. In addition, the social gradient of smoking behaviour justifies denormalization strategies because lower social classes that have high smoking-related morbidity and mortality rates will derive substantial health benefits (Bayer, 2008). As long as denormalization strategies are effective at decreasing the prevalence of smoking among all social groups, the social denormalization of tobacco smoking may be justified, even though it may contribute to an increased stigma for smokers. There are indications that smokers with higher educational levels experience a greater degree of smoker-related stigma than do those with less education (Stuber et al., 2008), which calls into question the role of stigma as a reinforcing mechanism for social inequality in smoking behaviour. The effect of stigma on social inequality in smoking behaviour is also unknown and needs to be explored further.

On the other side is the question of whether a government can carry out a strategy that stigmatizes some individuals. Stigma has been defined as a "vicious form of social control" (Burris,

2008), and it puts an unnecessarily heavy burden on those who are already socially marginalized. The strategy of denormalizing smoking behaviour may have been ethically justifiable when smoking was a widespread phenomenon, but the rationale for a stigmatizing strategy is questionable as smoking becomes a less-prevalent phenomenon associated with marginalized social groups (Bell et al., 2010; Burris, 2008). Phelan et al. (2004) believe that stigma should be avoided as far as possible because stigmatizing processes impose further risk on a vulnerable group and restrict their access to protective factors.

6.3 Social inequality in smoking behaviour and "the poor smoker"

There is great interest in the field of tobacco control in studies that shed light on the hardening hypothesis. This is because the characteristics of the remaining population of smokers suggest what to expect when smoking rates decline further, which can help to direct further tobacco control policies. Studies that have failed to support the hardening hypothesis have been used as an argument for a tobacco endgame, because the absence of hardening suggests that all smokers can be persuaded to quit, which opens the way to phase out all forms of tobacco use (Fernandez et al., 2015). However, this strategy has been criticized for neglecting the social dimension of smoking, as it regards smoking as an isolated social phenomenon disconnected from its social context. It has also been criticized for putting too much faith in smokers as rational actors who "choose" to smoke or to quit (Ford, 2001).

Studies that have found hardening in various forms, such as increased social inequality in smoking behaviour, the association of social problems or mental disorders with smoking, and/or an increased difficulty in handling the problem of addiction, have been used as an argument to change the direction of tobacco control policy. To address this problem, tobacco control should consider strategies that do not contribute to the stigmatization of smokers. Instead of the "last smoker", the "poor smoker" seems to be a more accurate description in the present situation (Ford, 2001; Ford, 1999). Socially disadvantaged people are less likely to adopt the non-smoking norm, as the "social

polarizing of smoking behaviour mirrors similar processes already active in the contemporary political climate" (Ford, 2001).

This approach supports harm reduction strategies such as the use of ENDS/e-cigarettes as a method that may appeal to smokers who are not able to quit, and it may even be an effective smoking cessation method for smokers who have no motivation to quit. There is considerable disagreement in discussions about the future of tobacco control regarding the most effective and just strategy (Henningfield, 2014; Malone, 2010). There are substantial criticisms of harm reduction strategies that use ENDS, questioning its effect as a smoking cessation aid, the renormalization of smoking behaviour, the risk of continued nicotine use, and the fear that it is a gateway into smoking for adolescents (Chapman, 2014). In Norway, a white paper on public health, Folkehelsemeldingen (Box 1) endorses the use of harm reduction strategies as a supplement to traditional tobacco control strategies (Ministry of Health and Care Services, 2014).

Even though the present thesis study on hardcore smokers and changes over time concluded that there was a "softening" of the smoking population with respect to the willingness to quit, this willingness to quit smoking was tempered by ambivalence. In addition, this thesis demonstrates the problems of social inequality in smoking behaviour, low self-worth and stigma among smokers, and resistance towards new tobacco control policies. There are some additional empirical studies on smoking stigma in Norway (Sæbø, 2012). The evidence of social inequality in smoking behaviour is strong and has been demonstrated in many countries at the same stage of the cigarette epidemic as Norway.

The evidence of social inequality in smoking behaviour and increased smoker stigma has transform the tobacco epidemic into a social justice issue (Voigt, 2010). A social justice perspective in tobacco control implies policies that help disadvantaged smokers quit and thereby contribute to health equality. In particular, such socially just policies should be particularly sensitive to the harm tobacco control policies may cause vulnerable groups (Voigt, 2010). For example, banning smoking in cars when children are present has been accepted by both smokers and non-smokers (paper 4), and it is a strategy

that can be implemented without stigmatizing smokers. Sales restrictions is not supported by smokers, but they may not represent tobacco control strategies that contributes to stigma processes. In contrast, banning smoking in outdoor settings such as parks could increase the stigmatization of smokers by increasing smokers' feelings of being unwanted and deviant in public. The stigmatization of already disadvantaged groups is problematic from a social justice perspective (Bayer & Stuber, 2006). In such cases, tobacco control advocates need to consider the potential harm of stigmatization and its effect on the social inequality of smoking.

6.4 Conclusion

In summary, the following conclusions may be drawn from this thesis. First, even though the concept of a hardcore smoker was not found to be an increasing phenomenon in Norway, this thesis stresses the need for a better understanding of hardcore smokers, as well as a robust definition of the concept. Although a "softening" of the smoking population was suggested, the hardcore smoking group was mainly defined in terms of absence of quit intention. As was shown, ambivalence among smokers his high. It remains to be seen whether the apparent softening found here leads to a steady downward trend in smoking prevalence. Second, relative to snus users, smokers have more negative emotions about their own smoking, including the experience of subjective stigmatization. Third, the thesis supports the association between smoking behaviour and educational level. Low educational level was associated with heavy cigarette consumption, high cigarette dependence, and no intention to quit smoking, all of which are characteristics that are used to define hardcore smokers. Fourth, smokers oppose further regulations on smoking, both with respect to reduced cigarette accessibility and restrictions on smoking in some outdoor settings. However, although they were largely resistant to the proposed strategies, some exceptions were found, such as strategies aimed at protecting children from passive smoking and smoking prevention strategies for the young.

6.5 Directions for future research

We should continue to monitor the relative size of the hardcore smoking group, in addition to other indicators such as quit rates, cigarette consumption and measures of cigarette dependence. It is also of interest to measure nicotine dependence, as there are several sources for nicotine delivery available on the market.

More research is needed to improve our understanding of social inequality in smoking behaviour. This implies not only educational differences, but also broader examinations of associations between smoking and mental illness, and between smoking and other addictive behaviours. Knowledge of accumulation of health risk behaviours in different social groups is of interest.

The role of harm reduction in reducing smoking rates in general, and the appeal of e-cigarettes among smokers with low SES or other marginalized groups, needs to be explored.

The concepts of stigma and resistance both need to be explored further. We need to know more about different types of stigma, such as structural discrimination, social disapproval of smoking and self-stigma, in addition to the size of the stigmatization problem in the population. Stigmatization may be an unrecognized mechanism in the tobacco epidemic, and we should focus on the role stigmatization plays in relation to inequality in smoking behaviour. There is a need for more qualitative research about hardcore smokers, resistance and stigmatization to improve our understanding of the roles they play in smoking behaviour. In the interplay between tobacco denormalization, non-smoking norms, and social inequality in smoking, resistance is an interesting concept that needs further investigation.

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Original Investigation

Hardcore Smokers in Norway 1996–2009

Marianne Lund, M.Sc., Karl Erik Lund, Ph.D., & Elisabeth Kvaavik, Ph.D.

Norwegian Institute for Alcohol and Drug Research, Oslo, Norway

Corresponding Author: Marianne Lund, M.Sc., *Norwegian Institute for Alcohol and Drug Research, PO Box 565, Centrum, 0105 Oslo, Norway. Telephone: +47 22340255; Fax: +47 22340401; E-mail: ml@sirus.no*

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Abstract

Introduction: The aim of this study was to investigate changes in the relative proportion of hardcore smokers (HCS) in Norway for the years 1996–2009.

Methods: Data were derived from Statistics Norway's annually cross-sectional representative samples of the adult population. The total sample size of smokers each year was between 250 and 500. The outcome measure was HCS, defined by their intention not to quit smoking and absence of attempts to quit during the last 12 months. Logistic regression analysis was conducted to estimate the association between time (survey year) and the number of HCS.

Results: We identified three groups of smokers: occasional smokers, daily non-HCS, and HCS. The relative proportion of HCS declined in the period 1996–2009, from 30% to 23%. A model adjusted for gender, age, educational level, and the use of snus (smokeless tobacco) showed the same downward trend.

Conclusions: Within this sample of Norwegian smokers, the relative share of HCS is not increasing. This knowledge is important for tobacco prevention policy. The result does not support a hardening hypothesis regarding changes in the size of the group of HCS. Further analysis is needed to investigate individual resistance to smoking cessation.

Introduction

Cigarette smoking is declining in Norway, a trend shown both in population surveys and official sales statistics of smoking tobacco products (M. Lund & Lindbak, 2007; Norwegian Institute for Alcohol and Drug Research, 2010). Daily smoking has dropped continually since 1973 among men and since 2000 among women. A gender convergence in daily smoking occurred in the late 1990s and has been present since (Norwegian Directorate of Health, 2010). The amount of smoking tobacco consumed annually per adult decreased from 2 to 1.5 kg for men and from 1.6 to 1.3 kg for women in the period 1996–2007 (K. E. Lund, Lund, & Bryhni, 2009). From 1996 to 2009, daily smoking among 16–24 years dropped from 30% to 15% (Statistics Norway, 2007). However, in the adult population, there has been no significant decline in smoking rates during the most recent period, causing speculation that a smoking prevalence plateau has been reached.

The Norwegian Tobacco Act came into force in 1975, with the most important regulations being a ban on tobacco advertising and age restrictions for buying tobacco. Since then, several tobacco control measures have been introduced. At present, regulatory restrictions include an age limit of 18 years for purchasing tobacco, warning labels on tobacco products, a ban on smoking in bars and restaurants from 2004, and the requirement for all retailers to put tobacco products out of sight for customers from 2010. Norway is considered to have a strict tobacco prevention policy, ranking as the fourth country on a European tobacco control scale (Joossens & Raw, 2006, 2007). However, in spite of having a strict tobacco prevention policy, 30% of Norwegian adults still smoke daily or occasionally.

The concept of hardcore smokers (HCS) and the hardening hypothesis are essential in this study. HCS refer to a group of smokers who probably would not quit smoking. Studies that have analyzed HCS at an individual level have found that HCS are distinct from other smokers. They are more likely to be male (Emery, Gilpin, Ake, Farkas, & Pierce, 2000; Jarvis, Wardle, Waller, & Owen, 2003; MacIntosh & Coleman, 2006), to be older (Emery et al., 2000; Jarvis et al., 2003), and to have a low level of education and income (Augustson & Marcus, 2004; Emery et al., 2000; Ferketich et al., 2009; Jarvis et al., 2003). The size of the HCS group has also been addressed. HCS constitute 5% of Californian smokers (Emery et al., 2000), 13.7% of all U.S. smokers (Augustson & Marcus, 2004), and 16% of smokers in England (Jarvis et al., 2003). HCS have some similarities with so-called precontemplators in the Transtheoretical Model, which are defined as smokers with no quit intention during the next six months (Velicer Rossi, Prochaska, & DiClemente, 1996). About 65% of the remaining smokers in Europe and United States are precontemplators (Meyer, Rumpf, Schumann, Hapke, & John, 2004). Early smoking onset, high consumption of cigarettes per day, and prolonged smoking are other characteristics of HCS, factors that could indicate high nicotine dependence among this group (Augustson & Marcus, 2004). Studies using Fagerström Test for Nicotine Dependence (FTND) found higher FTND scores among smokers not willing to quit compared with other

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smokers (Haukkala, Laaksonen, & Uutela, 2001). A higher proportion of HCS smoke their first cigarette within 30 min after awakening compared with other smokers (Emery et al., 2000).

The association between nicotine dependence and smoking cessation has been widely addressed in tobacco research. A selection hypothesis has been introduced, stating that smokers with low nicotine dependence level quit at a higher speed, leaving behind a group of smokers who are highly nicotine dependent (Hughes, 1993). The idea that as smoking prevalence in a society decreases, the remaining smokers will become more hardcore, is referred to as the "hardening hypothesis" (Warner & Burns, 2003). One study supporting the hardening hypothesis compared the prevalence of smoking in different countries with the subsequent level of nicotine dependence in the countries (Fagerstrom & Furberg, 2008). This study found an inverse relationship between FTND scores and smoking prevalence across countries. The finding that countries with a low prevalence of smoking had high scores on the nicotine dependence scale was interpreted as a result of higher smoking cessation activity among the low-dependent smokers. Other studies giving support to the hardening hypothesis investigated smoking cessation success in clinical settings and found lower success rates over time in both interventions using pharmacotherapy and behavioral therapy as smoking cessation aids (Irvin & Brandon, 2000; Irvin, Hendricks, & Brandon, 2003).

However, other studies investigating the hardening hypothesis have not supported the hypothesis. In the monograph "Those who continue to smoke," the overall conclusion was that hardening among the remaining smokers in the United States is probably not the case (National Cancer Institute, 2003). This conclusion is supported by proponents of a softening hypothesis, based on the idea that tobacco intervention at a population level would influence all smokers (Chaiton, Cohen, & Frank, 2008). One premise for the nicotine dependence explanation to be true is the need for replacement of new highly nicotine-dependent smokers to maintain a high nicotine dependence level on average. This situation is not likely to occur since most new smokers consist of both high- and low-dependent smokers (Warner & Burns, 2003).

The hardening hypothesis focuses on nicotine dependence as an explanation, but psychosocial factors have also been outlined as important factors for a potential hardening of the remaining smoking population (Hughes, 2003). Accumulation of other health risk factors such as mental illness or accumulation of unhealthy lifestyle factors could make it harder for smokers to quit (Haukkala et al., 2001; Lasser et al., 2000). A recently published study from Australia found that psychological distress and social disadvantage were more common among smokers than among nonsmokers, but there was no evidence that this relationship was getting stronger among smokers over time (Mathews, Hall, & Gartner, 2010). Other explanations for a potential hardening have been related to changes in the social composition of the remaining smokers, where a high proportion of smokers with lower socioeconomic status is expected to have a harder time quitting (Warner & Burns, 2003).

There is no established definition of HCS (Costa et al., 2010), but one often cited definition is "a daily, long-term smoker who is unable or unwilling to quit and who is likely to remain so even when possessing extensive knowledge about the hazards of smoking and when confronting substantial social disapprobation of smoking" (Warner & Burns, 2003). The definition of HCS used in our study relates both to the "unwillingness" and the "unableness" of Warner and Burn's construct of HCS. The absence of recent quit attempts, lack of intention to quit in next six months, and a belief in persistent smoking in five years could not only be related to an unwillingness to quit smoking but might also be based on the smokers belief that quitting smoking most probably would fail based on their experiences and/or low self-efficacy. The definition used does not cover those who are "unable" to quit due to nicotine dependence or other individual or social factors that could reflect a smoker's incapability toward smoking cessation. The aim of the study was to investigate relative changes in the proportion of HCS in the population of smokers in the time period 1996–2009 in Norway. The relative size of HCS over time was used as an indication of a possible hardening of the remaining population of smokers.

Methods

Samples and Procedures

We used data from annual cross-sectional surveys of tobacco behavior, comprising a representative sample of the adult Norwegian population (16+ years). Data were collected by Statistics Norway and the Norwegian Directorate of Health, and samples were drawn from Statistics Norway's own population database, which is updated every month with the National Population Register, a register that covers almost 100% of the Norwegian population. The samples were adjusted for gender and age in accordance with the population numbers for each survey year. Smoking behavior was one of the several topics in the surveys, and correspondence between the gross and the net samples for the variables related to smoking is not known. The data were collected from a combination of face-to-face and telephone interviews from 1996 to 2000. From 2001, all data have been collected by telephone interviews. The original annual sample was $N = 2{,}000$ minus a small sample each year which was not eligible due to death or emigration (varied between 13 and 32 respondents). The response rate varied from 56.5% in 2000 to 73% in 2002 (Table 1). The wordings of the questions for the variables used in this study were identical for every survey year. The study sample was restricted to daily smokers 25–74 years. Respondents below the age of 25 were excluded because they may still be in a smoking initiation phase, a condition taken into consideration in other studies of HCS (Augustson & Marcus, 2004; Emery et al., 2000).

Measures

We measured smoking status in two steps. The first question was: "Do you sometimes smoke?" Those who answered yes were then asked: "Do you smoke daily or occasionally?" All daily smokers were split into two separate groups. The HCS group was defined by using three different questions about smoking intention and previous attempts to quit. The first question was: "Are you considering to quit during the next six months?" The second question covered smokers' beliefs about future smoking: "Try to predict your smoking status in five years from now. Which statement fits your beliefs best?" Four answers were available: (a) "I will definitely be a daily smoker," (b) "I will probably be a daily smoker," (c) "I will probably not be a daily smoker," and (d) "I will definitely not be a daily smoker." The third question was: "Have you tried to quit smoking during the

Table 1. Sample Size 25–74 Years, Response Rate, Numbers and Prevalence of Daily Hardcore Smokers (HCS), Daily Non-Hardcore Smokers, and Occasional Smokers by Survey Year

Survey year	*N*, 25–74 years	Response rate, % (total sample)	Number and prevalence (%) of daily HCS	Number and prevalence (%) of daily non-HCS	Number and prevalence (%) of occasional smokers
1996	1,112	68	155 (14)	233 (21)	119 (11)
1997	1,105	69	171 (16)	215 (20)	107 (10)
1998	1,091	67	170 (16)	196 (18)	88 (8)
1999	948	59	146 (15)	162 (17)	99 (11)
2000	900	57	109 (12)	167 (19)	81 (9)
2001	1,017	64	135 (13)	194 (19)	102 (10)
2002	1,175	73	138 (12)	206 (18)	93 (8)
2003	1,054	66	97 (9)	195 (19)	91 (9)
2004	1,062	68	85 (8)	190 (18)	86 (8)
2005	986	65	55 (7)	164 (17)	82 (8)
2006	980	62	92 (9)	147 (15)	64 (7)
2007	1,029	63	73 (7)	165 (16)	82 (8)
2008	954	57	67 (7)	127 (13)	64 (7)
2009	977	58	54 (6)	145 (15)	55 (6)
Total	14,390		1,547 (11)	2,506 (18)	1,213 (8)

latest 12 months?" All daily smokers with no quit attempt during the previous year, no intention to quit during the next six months, and a belief in continued smoking status in five-year time (Answers 1 and 2, including those who answered "don't know" regarding future smoking) were defined as daily HCS. All other daily smokers were defined as daily non-HCS. The third group was defined as occasional smokers (Figure 1). In the analysis shown in Table 2, non-HCS and occasional smokers were merged as all other smokers.

The main independent variable was survey year, as a measure of time. In order to aid the presentation of the results, survey years were pooled in pairs and used as a categorical variable in the logistic regression analysis. We made adjustments for gender, age, and education since these variables were considered to be confounding variables based on earlier research on HCS. We also included use of smokeless tobacco (snus) as an independent variable to detect possible association between hardcore smoking and double use of tobacco. Age was grouped by

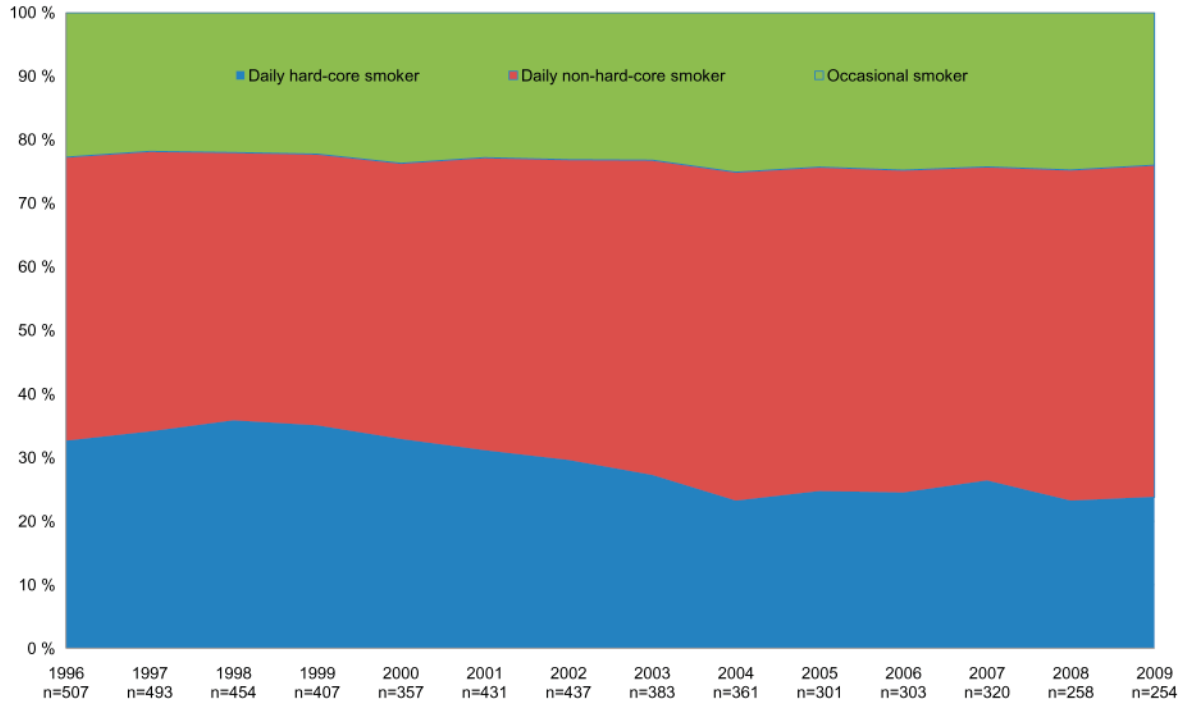

Figure 1. Relative share of daily hardcore smokers (HCS), daily non-HCS, and occasional smokers in the population of smokers, 25–74 years. 1996–2009. Three years moving average.

Table 2. Crude *OR* and *AOR* with 95% *CI* for Being a Daily Hardcore Smoker by Survey Year, Gender, Age, Education, and Snus Use

	Daily hardcore smoker vs. all other smokers		
Predictor variables	*n*/*N*	*OR* (95% *CI*)	*AOR* (95% *CI*)
Gender			
Female	736/2,591	1.00	1.00 (ref.)
Male	811/2,675	1.10 (0.97–1.24)	1.16 (1.02–1.31)
Age group, years			
25–38	432/1,941	1.00	1.00
39–52	552/1,916	1.41 (1.22–1.64)	1.39 (1.19–1.61)
53–74	563/1,409	2.33 (2.00–2.70)	2.21 (1.89–2.58)
Education level			
High	204/1,100	1.00	1.00 (ref.)
Low	1,317/4,051	2.12 (1.79–2.50)	2.01 (1.70–2.38)
Use snus daily or occasionally			
No	1,479/4,864	1.00	1.00
Yes	68/397	0.47 (0.36–0.62)	0.54 (0.40–0.72)
Survey year			
1996/1997	326/1,000	1.00	1.00 (ref.)
1998/1999	316/861	1.20 (0.99–1.45)	1.25 (1.02–1.52)
2000/2001	244/788	0.93 (0.76–1.13)	0.92 (0.75–1.13)
2002/2003	235/820	0.83 (0.70–1.02)	0.81 (0.66–1.00)
2004/2005	140/662	0.55 (0.44–0.70)	0.55 (0.43–0.70)
2006/2007	165/623	0.75 (0.60–0.93)	0.71 (0.57–0.89)
2008/2009	121/512	0.64 (0.50–0.82)	0.59 (0.40–0.72)
Survey year (1–7)		0.90 (0.88–0.93)	

Note. Daily and occasional smokers aged 25–74 years; $N = 5{,}266$. *AOR* = adjusted odds ratio; *OR* = odds ratio; *n* = number of hardcore smokers in each category; *N* = total number in the category.

using the cutoff point of three equal groups. We dichotomized information about highest completed education into *higher education*, which refers to completed university or college education (ranging from minimum 14 years in school), and *lower education*, which refers to completed primary or secondary school education. Those without any formal education were categorized as lower educated ($n = 12$).

Data Analysis

We analyzed the data in two ways. First, we used three-year moving averages to present the relative proportion of HCS, daily non-HCS, and occasional smokers in the population of all smokers for the years 1996–2009 (Figure 1). Second, we used logistic regression analysis to estimate the association between HCS and survey years, with adjustments for gender, age, educational level, and use of snus. The analysis shows crude odds ratio (*OR*) and adjusted odds ratios for hardcore smoking (Table 2). In the multivariate analyses, we entered all the independent variables into the model simultaneously. We tested all the independent variables for possible interaction with survey year. The interaction terms are not presented in the table, as there was no evidence of interaction with survey years. We calculated all the *OR* with a 95% *CI*.

Results

The percentage of daily smokers who reported no to quit attempt last year was 79.0%, 57.2% reported no quit intention next six months, and 48.7% stated a future belief in continued smoking. Those daily smokers who fulfilled all the three criteria defining HCS comprise 29.4% of the total sample of smokers for the years 1996–2009 (Table 1). The relative size of the HCS group declined in the study period 1996–2009 (Figure 1). At the beginning of the survey period, from 1996 until 2000, HCS constituted approximately 30% of the population of smokers, with a peak in 1998. After this period, the proportion of HCS decreased to 23% in 2004, the lowest observed level. After 2004, the percentage of HCS has been stable at 24%–25%.

The downward trend in hardcore smoking was confirmed in the logistic regression analysis (Table 2). We used 1996/1997 as the reference category for calculating the *OR* for being a HCS for the following survey years. We calculated crude *OR*s between HCS and years. This showed a steady decline in the *OR*s from 2000/2001. There was a significant increase in *OR* for hardcore smoking from the reference years to the next years 1998/1999, reflecting the peak observed in Figure 1. The crude *OR* was only significant for the years 2004/2005, 2006/2007, and 2008/2009 when compared with the reference years 1996/1997. Using survey year as a continuous variable (seven measure points) gave a significant downward trend. The multivariate model adjusted for gender, age, education, and snus use gave approximately the same *OR* for being a HCS as the bivariate analysis. No significant interaction terms were detected between survey year and the confounding variables gender, age, educational level, or snus. Increasing age, being male, and having low educational level showed higher *OR*s for being a HCS (Table 2).

Discussion

In the present study, we have shown that there is a downward trend in HCS relatively to other smokers in the period 1996–2009. Daily smokers who have no intention to quit in both the short term and the long term and who have made no attempts to quit have become more and more rare during the survey period. In this study, 24% of all smokers were categorized as HCS in 2009. This estimate of HCS is different from the estimates in England in 1994–1997 (16%) and in a national U.S. sample from 1998 to 1999 (13.7%; Augustson & Marcus, 2004; Jarvis et al., 2003). One possible reason is differences in the definition of HCS. The definition used in this study does not include prolonged smoking during the last five years or daily cigarette consumption.

The results from this study do not support a hardening hypothesis, if hardening is defined as increased unwillingness or unableness of the remaining smokers to quit smoking. An alternate hypothesis of softening rather than hardening has been highlighted, based on upstream tobacco prevention policies that influence the whole population of smokers (Chaiton et al., 2008). By using Geoffrey Rose's epidemiological perspective of the "curve shift" (Rose, 2001), the potential of population tobacco control intervention to move all smokers in a "smoking cessation direction" is highlighted. An increasing proportion of cessation prone smokers, as found in this study, could be interpreted as a result of intensified tobacco control interventions. One U.S. study comparing state-level prevalence with smoking cessation found higher cessation activity in states where smoking prevalence was the lowest (Burns, Major, Anderson, & Vaughn, 2003).

Several tobacco control interventions have taken place in Norway during the study period, especially in the second half of the period. Several antismoking media campaigns were launched between 2003 and 2006 with high awareness rates (K. E. Lund, 2009). Antismoking media campaigns are designed to influence beliefs, attitudes, and behavior, and there is strong evidence for their benefits in tobacco control (Wakefield, Loken, & Hornik, 2010). Media campaigns have the potential to influence norms regarding smoking, and an unfavorable climate for smoking makes smokers more willing to quit (Kim & Shanahan, 2003). On June 1, 2004, Norway implemented a total ban on smoking in bars and restaurants. Before the implementation, a media campaign drew attention to nonsmokers' rights and employees' protection from passive smoking. A drop in the relative proportion of HCS was observed a few months after the ban was implemented, as shown in Figure 1. A separate analysis was performed (not shown) to detect whether the drop in the percentage of HCS was to be found mainly from changes in intention to quit smoking in the next six months, changes in quit attempts last year or changes in the smokers belief about own future smoking. The results revealed that the drop in 2004 was due to increased smoking cessation attempts. Results from Scotland also support the hypothesis that a ban on smoking may influence intention to quit through changing social norms (Brown, Moodie, & Hastings, 2009).

Warner and Burns (2003) define the hardening hypothesis as an average decrease in the ability to quit smoking, and they point out that a sizeable group of HCS may be identified without finding evidence for hardening. Studies on HCS published to date have measured the size of the group at a single point in time. To our knowledge, this is the first study identifying HCS and the relative proportion of this group over time. It is expected that a decreasing relative proportion of HCS over time would influence the average desire to quit in the population of daily smokers. But whether the downward trend in HCS influences the ability to quit among the remaining smokers on average is unknown.

Some proponents of the hardening hypothesis emphasize nicotine dependence as the root cause for the hardening mechanism (Fagerstrom & Furberg, 2008), but measures of nicotine dependence have also shown diverging results for predicting successful smoking cessation. Higher cessation reports are found among those with a low score and a high score on the Heaviness of Smoking Index compared with medium scores (Chaiton, Cohen, McDonald, & Bondy, 2007). An alternative understanding of the hardening hypothesis could be that remaining smokers are more nicotine dependent now because of dual or triple use of nicotine products, like smokeless tobacco (snus) and/or nicotine replacement therapy in combination with cigarette smoking. The prevalence of double use of tobacco is reported to be low in Norway, 4.5% of the adult population (Norwegian Directorate of Health, 2010). The logistic regression analysis in this study showed that the *OR* for being HCS was significantly lower for those who use snus daily or occasionally, indicating that dual use is not a HCS phenomenon.

Other explanations of the hardening hypothesis highlight changes in the social composition of the remaining population of smokers. These changes may mean that it is harder to quit today than previously (Warner & Burns, 2003). One such factor is the strong association between smoking and low socioeconomic position found in Northern Europe, including Norway (K. E. Lund & Lund, 2005; M. Lund & Lund, 2005; Schaap, van Agt, & Kunst, 2008). In this study, we found higher odds for being a HCS among smokers with a low level of education but no indication for an increasing association over time (no significant interaction between education and survey year). Low education or socioeconomic position is associated with lower smoking success rates (Gilman, Abrams, & Buka, 2003; Kotz & West, 2009; Reid, Hammond, & Driezen, 2010). Explanations for these differences may be found in the experience of socioeconomic hardship and deprivation (Layte & Whelan, 2009).

Preventing smoking behavior by using population intervention strategies could also have some unintended consequences with relevance for the hardening versus softening debate. Repeated exposure of an antismoking message over a long time could desensitize smokers and lead to a boomerang effect where the target group react in the opposite way to the intended response (Hyunyi & Salmon, 2007). Recent studies have focused on the increasing social denormalization of smoking, which is defined as strategies that seeks to change the norms around using tobacco, making tobacco use an abnormal behavior (Hammond, Fong, Zanna, Thrasher, & Borland, 2006). Negative consequences of denormalization have been outlined, such as increased social stigma toward smokers (Stuber, Galea, & Link, 2008) and that increasing stigma would exacerbate the existing social inequality in smoking (Bell, Salmon, Bowers, Bell, & McCullough, 2010). Such a boomerang effect could result in an

increasing relative proportion of HCS over time and/or hide a hardening effect among remaining smokers by increasing psychological reactance and hostility toward changing their smoking behavior.

Strengths and Limitations of the Study

The strength of this study was the sample's representativeness for the adult population in Norway. Another unique possibility with these data was the ability to define HCS for 14 separate survey years and to observe the development of the group over time. In this study, we have used a somewhat different definition of HCS than earlier published studies on this subject. We find the inclusion of future belief about smoking as strengthening the concept of HCS. The study's limitations are first of all the lack of a valid measure of nicotine dependence. FTND scores are only available from the survey year 2005 and onwards and were therefore not included in this study. The association between HCS and nicotine dependence has been highlighted in other studies (Emery et al., 2000). The second limitation deals with the tendency of decreasing response rate by time. Even though the latest surveys response at 58% is considered acceptable, we lack information about the nonresponse group. Nonresponse bias regarding smoking status is not known. The only available nonresponse analysis is on known variables as gender, age, and region (Statistics Norway, 2007). Social desirability bias is also a possibility, where smokers exaggerate their intention to quit, conforming to the no-smoking norm. If such a mechanism is present, it would lead to an underestimation of HCS. At last, the decreasing pool of smokers over time gives small number of cases and limits the possibility for detailed analysis.

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Declaration of Interests

None declared.

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II

III

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Research Article

Social Inequality in Cigarette Consumption, Cigarette Dependence, and Intention to Quit among Norwegian Smokers

Marianne Lund

Norwegian Institute for Alcohol and Drug Research, P.O. Box 565, Centrum, 0105 Oslo, Norway

Correspondence should be addressed to Marianne Lund; ml@sirus.no

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Background. The study aim was to examine the influence of education and income on multiple measures of risk of smoking continuation. *Methods*. Three logistic regression models were run on cigarette consumption, dependence, and intention to quit based on nationally representative samples (2007–2012) of approximately 1 200 current smokers aged 30–66 years in Norway. *Results*. The relative risk ratio for current versus never smokers was RRR 5.37, 95% CI [4.26–6.77] among individuals with low educational level versus high and RRR 1.53, 95% CI [1.14–2.06] in the low-income group versus high (adjusted model). Low educational level was associated with high cigarette consumption, high cigarette dependence, and no intention to quit. The difference in predicted probability for having high cigarette consumption, high cigarette dependence, and no intention to quit were in the range of 10–20 percentage points between smokers with low versus those with high educational level. A significant difference between low- and high-income levels was observed for intention to quit. The effect of education on high consumption and dependence was mainly found in smokers with high income. *Conclusion*. Increased effort to combat social differences in smoking behaviour is needed. Implementation of smoking cessation programmes with high reach among low socioeconomic groups is recommended.

1. Introduction

While smoking rates among countries across the Western world are gradually decreasing, concerns over social inequality in smoking behaviour are increasing. Many studies have found an association between smoking behaviour and different measures of socioeconomic status (SES) such as education, income, and occupational class [1–3]. Smokers with low SES also have poorer cessation outcomes. This inequality pattern has been observed in studies of smoking cessation interventions and aggregated-level quit rates [4–6]. There is also some evidence of increasing social inequality in smoking behaviour and substantial health disparity consequences [7, 8].

In Norway, smoking rates are gradually declining, with a rate of 22% in 2014 in the adult population aged 16–74 years (13% are daily smokers). Norway has a strong welfare system and strives to be an egalitarian society that provides equal opportunities for all citizens. Despite reduced mortality in all educational groups, educational inequality in mortality increased in Norway in the period 1960–2000 [9]. Smoking is one mechanism behind this inequality [10]. Increased knowledge about social inequality in smoking behaviour can inform tobacco prevention efforts.

The pathways to successful quitting have been widely studied. Nicotine dependence is regarded as a primary barrier to giving up smoking and is predictive of smoking continuation [11]. Number of cigarettes per day (CPD) has often been used as a proxy for nicotine dependence, although some studies indicate that one should be cautious in interpreting high cigarette consumption as nicotine dependence. CPD is significantly associated with nicotine dependence, but differences in dependence are found to be independent of CPD level [12]. However, high cigarette consumption indicates a strong habit and illustrates aspects of dependence such as the time and effort the smoker dedicate to the behaviour [13].

Nicotine dependence has been widely measured in population-based surveys using different measurements like the Fagerström Test for Nicotine Dependence (FTND) and associated short versions such as the Heaviness of Smoking Index (HSI) and time to first cigarette in the morning (TTFC). The TTFC is likely the single item in the FTND

that most strongly predicts addiction to nicotine, probably because morning smoking reflects the smoker's overnight withdrawal symptoms [14]. TTFC also shows good correlation with biological measures of nicotine ingestion [15].

The FTND, TTFC, and number of CPD are all predictive of smoking continuation and significantly associated with relapse following a quit attempt [16, 17]. Having an intention to quit smoking is strongly associated with quit attempts but is less consistent with quitting success [18].

Measures of nicotine dependence such as the FTND, HSI, and TTFC are significantly related to SES and show increasing dependence with decreasing SES [17, 19, 20]. The association between nicotine dependence and SES is also found in studies using biochemical measures of dependence, such as levels of cotinine in plasma [21].

However, the association between intention to quit and SES is less clear. Some studies report a positive relationship between low-SES smokers and intention to quit or quit attempts but reduced smoking cessation success among low-SES smokers [6, 22]. Other studies investigating the transtheoretical model of change report a higher proportion of smokers with a low educational level in the precontemplation stage (i.e., a smoker who does not intend to quit) [23, 24].

Norway is in the final stage of the tobacco epidemic, experiencing both a gradual decline in smoking prevalence and persistent inequality in smoking habits. In this situation, it is of interest to investigate differences in smoking behaviour that indicate smoking continuation. Risk of continued smoking is defined in three ways: high cigarette consumption, high cigarette dependence, and having no intention to quit. The aim of this study was to investigate the associations between education and income and risk of high cigarette consumption, cigarette dependence, and intention to quit. Because education and income are related, it was of interest to explore the combined effect of social inequality measures on risk of smoking continuation.

2. Method

2.1. Study Sample. Data were pooled from six cross-sectional datasets representative of the Norwegian population during 2007–2012. Approximately 1 200 respondents aged 16 years or older were surveyed by telephone during the autumn of each year by Statistics Norway. The study sample was 4 591 respondents aged 30–66 years. The lower age cut-off for inclusion was 30 years because younger adults may not have completed their education. A study sample aged 30 years or older also represents a population of individuals with an established smoking history, since more than half of daily smokers start smoking before age 18. Individuals who received early retirement pensions ($n = 197$) were excluded from the study sample, along with 89 individuals with missing education information. Survey response rates were 67% (2007), 57% (2008), 61% (2009), 54% (2010), 58% (2011), and 61% (2012).

2.2. Dependent Variables: Cigarette Consumption, Cigarette Dependence, and Absence of Intention to Quit. Three measures were used to capture risk of smoking continuation: cigarette consumption, nicotine dependence, and intention to quit. High *cigarette consumption* was defined as consumption of 15 CPD or more. Occasional smokers with an average weekly consumption above 105 were coded in the +15 CPD group. *Cigarette dependence* was the time to first cigarette in the morning (TTFC); individuals smoking within the first 30 minutes after awakening were defined as having high cigarette dependence and individuals who smoked 31 minutes or more after wakening had low cigarette dependence [14]. Although TTFC is most often referred to as a measure of *nicotine dependence*, it also captures nonpharmacological aspects of cigarette dependence such as psychosocial functions [13]. The term *cigarette dependence* is therefore preferred in the present study. Having no *intention to quit* was a measure of smokers' short- or long-term intention to quit; smokers with no intention to quit within the next 6 months and who also believed they would still be smoking in 5 years were defined as having no intention to quit.

2.3. Socioeconomic Measures: Education and Income. Two measures of SES were included as independent variables: educational level and income level. Educational level was recoded from the original nine-level variable to three levels: completion of lower secondary, upper secondary, and university levels. For the interaction analysis, we used a dichotomous measure of education with *high educational level* including completion of upper secondary school or university and *low educational level* representing completion of lower secondary school. Income was defined by combining the gross household income and marital status. Those with an annual household income above the median (NOK 700 000, ≈USD 160 000 or more) were coded in the high-income group. Medium income was NOK 300 000–699 000 (≈USD 36 000–50 000) and low income was below NOK 300 000. Those with a household income of NOK 300 000–699 000 and living alone were coded as having high income. In the study sample, 12% were in the low-income group (7% of the population sample, see Table 1). This is comparable to the percentage defined as having low income in Norway using the EU definition of 60% of median income [25].

2.4. Analyses. Data analyses were conducted in two parts. First, the representative sample was used to confirm socioeconomic differences in smoking status. For the multinomial regression, the smoking outcome category was defined as current and former smokers, with nonsmokers as the reference category. Results from this analysis are presented as a relative risk ratio (RRR) in Table 2. The characteristics of the population sample and study sample of all current smokers (daily and occasional smokers) are presented in Table 1. The logistic regression analysis included three binary outcomes reflecting risk of smoking continuation (cigarette consumption, cigarette dependence, and intention to quit), with education and income as independent variables. The models were adjusted for survey year, age, sex, and numbers of household members. Three logistic models were used to compute adjusted prediction (predicted probabilities) of the

Table 1: Characteristics of the population and study samples (current smokers). Participants aged 30–66 years. Data were pooled from 2007 to 2012.

	Population sample ($N = 4\,600$)	n	Study sample (current smokers, $n = 1\,282$)	n
Age (mean, SD)	47.7 (10.2)	4 600	47.7 (9.7)	1 282
Male (%)	49.1	2 260	49.9	640
Educational level				
High	39.1	1 798	23.7	304
Medium	43.7	2 008	47.4	607
Low	17.3	794	28.9	371
Household income				
High	66.9	2 849	60.1	701
Medium	25.9	1 105	27.8	324
Low	7.2	308	12.2	142
Daily smokers (%)	20.4	937	73.1	937
Heavy smoking ≥15 CPD	7.9	365	28.5	365
TTFC ≤30 minutes	9.3	423	34.3	423
No intention to quit	7.1	327	25.7	237

Table 2: Adjusted multinomial regression for education and income according to smoking status with never smoker as reference group. Relative risk ratio (RRR) and 95% confidence interval. Bivariate and adjusted models.

	Model 1: bivariate relationship Never smoker = ref.		Model 2: adjusted for survey year, age, sex, and members of the household Never smoker = ref.	
	Current smoker	Former smoker	Current smoker	Former smoker
High education	Ref.	Ref.	Ref.	Ref.
Medium education	2.59 (2.21, 3.06)***	1.92 (1.63, 2.25)***	2.53 (2.12, 3.02)***	1.75 (1.47, 2.08)***
Low education	5.66 (4.61, 6.95)***	2.31 (1.84, 2.89)***	5.37 (4.26, 6.77)***	2.05 (1.59, 2.65)***
High income	Ref.	Ref.	Ref.	Ref.
Medium income	1.44 (1.22, 1.70)***	1.44 (1.22, 1.71)***	1.07 (0.89, 1.29)	1.16 (0.97, 1.40)
Low income	2.76 (2.12, 3.59)***	1.17 (0.84, 1.64)	1.53 (1.14, 2.06)**	0.84 (0.58, 1.21)

***$P < .001$, **$P < .01$, *$P < .05$.

outcomes across the SES measures and marginal effects (differences in predicted probabilities) between different levels of SES (Table 3). Marginal effects show how the outcome changed for each change in the categorical independent variable. Marginal effects are estimated as average marginal effects, which means that other variables in the model are used *as observed* for each case. Tables 4 show the predicted probability for each combined group of education and income using the margins command (education # income) and the delta method was used to examine the statistical significance of group comparisons [26]. Only dichotomous measures of education and income were used for the combined effect (high versus low). All analyses were conducted using Stata statistical software (v.13).

3. Results

The proportion of individuals with low educational level (28.9%) was higher in the study sample of current smokers than in the population sample (17.3%) (Table 1). The proportion with low income level was 12.2% in the study sample and 7.2% in the population sample. One out of four current smokers reported having high cigarette consumption and no intention to quit, while one out of three reported having high cigarette dependence. Social inequality in smoking behaviour was confirmed. Educational differences were present in both the bivariate and the adjusted models, with RRR of 5.37, 95% confidence interval [4.26–6.77] for current compared with never smokers in the low educational level (Table 2).

Table 3: Adjusted predicted probabilities and marginal effects (differences in predicted probabilities) of the outcomes high consumption, high cigarette dependence, and no intention to quit smoking by education and income. All variables included in each model, in addition to survey year, age, sex, and number of persons in household. Current smokers aged 30–66 years. Data were pooled from 2007 to 2012.

	High consumption $N = 1147$ Percent (95% CI)		High cigarette dependence $N = 1105$ Percent (95% CI)		No intention to quit $N = 1142$ Percent (95% CI)	
	Adjusted predicted probability	Marginal effects (difference in predicted probability)	Adjusted predicted probability	Marginal effects (difference in predicted probability)	Adjusted predicted probability	Marginal effects (difference in predicted probability)
Education						
High	17.9 (13.2, 22.6)	Reference	19.8 (14.7, 24.8)	Reference	19.1 (14.2, 24.1)	Reference
Medium	29.8 (26.1, 33.5)	11.9 (5.9, 18.0)***	36.3 (32.2, 40.3)	16.5 (10.0, 23.0)***	25.0 (21.4, 28.5)	5.9 (−0.2, 12.0)
Low	33.3 (28.1, 38.4)	15.4 (8.2, 22.5)***	39.0 (33.5, 44.4)	19.2 (11.6, 26.8)***	30.6 (25.6, 35.6)	11.5 (4.3, 18.7)**
Income						
High	25.1 (21.8, 28.4)	Reference	29.5 (25.9, 33.1)	Reference	20.8 (17.9, 24.3)	Reference
Medium	35.1 (29.8, 40.3)	10.1 (3.7, 16.3)**	39.3 (33.9, 44.7)	9.8 (3.2, 16.4)**	30.4 (24.8, 35.0)	9.6 (3.5, 15.7)**
Low	26.2 (19.0, 33.4)	1.1 (−7.0, 9.2)	36.6 (28.4, 44.8)	7.1 (−2.0, 16.2)	34.7 (25.1, 42.1)	13.9 (4.8, 23.1)**

***$P < .001$, **$P < .01$, *$P < .05$.

Table 4: Margins (adjusted predicted probability) for high consumption of cigarettes, high cigarette dependence, and no intention to quit by education and income (margins income # education).

Education	Income	High cigarette consumption			n	High cigarette dependence			n	No intention to quit			n
		Margins	Unadjusted groups			Margins	Unadjusted groups			Margins	Unadjusted groups		
High	High	25.7	A		758	30.3	A		725	21.4	A		755
High	Low	26.7	A	B	76	34.2	A	B	74	31.8	A	B	76
Low	High	35.9		B	252	39.7		B	247	30.6		B	252
Low	Low	26.2	A	B	61	40.9	A	B	59	40.3		B	59

Margins sharing a letter in the group label are not significantly different at the 5% level.

A significant association between income and current smoking was observed in the bivariate model. In the adjusted model, the RRR for current smoking was 1.53, 95% confidence interval [1.14–2.06] in the lowest compared with the highest income group.

Table 3 presents three separate logistic regression models for the outcome variables high cigarette consumption, high cigarette dependence, and having no intention to quit. Adjusted predicted probabilities for the outcomes of interest are presented for each SES group. Among current smokers, the probability of high cigarette consumption, high cigarette dependence, and having no intention to quit increased with reduced educational level (Table 3). The marginal effect shows a 15 percentage point increase between the highest and lowest educational groups in the predicted probability of having high cigarette consumption. The marginal effect of education on cigarette dependence showed a 19 percentage point increase.

Income produced somewhat different results than educational level, with the highest probability of the outcomes of high consumption and high cigarette dependence among those with medium income level. Low-income smokers had the same probability of being a high-consuming smoker as the high-income group, 26% and 25%, respectively (Table 3). The probability for cigarette dependence for high-, medium-, and low-income groups was 30%, 39%, and 37%, respectively.

Having no intention to quit was significantly associated with low educational level and low or medium income (Table 3). The adjusted predicted probability that a smoker with a low educational level would have no intention to quit was 31%, while the corresponding percentage for smokers with a high educational level was 19%.

Table 4 presents the adjusted predicted probabilities for the outcome variables for every combination of high and low educational levels and income. The education effect for the outcome cigarette consumption and cigarette dependence was only found among those with high income. There was a 10 percentage point difference in the probability of having a high cigarette consumption and being highly dependent on cigarettes between the highly educated with high income compared with those with a low educational level with high income (Table 4). A 10 percentage point difference was also found for cigarette dependence between those with high levels of both education and income compared with those with low levels of both education and income ("top-bottom" differences), but the difference did not reach statistical significance. An educational effect among the high-income smokers was

also found for no intention to quit smoking, with a 9 percentage point difference. A significant "top-bottom" difference for having no intention to quit smoking was also observed, with a 19 percentage point difference in predicted probabilities. For example, a smoker with high educational level and high income had a predicted 21% chance of having no intention to quit smoking, while the corresponding number for a smoker with low educational level and low income was 40%.

4. Discussion

This study revealed a strong association between education and the outcomes indicating risk of smoking continuation: high cigarette consumption, high cigarette dependence, and having no intention to quit. Low income had an independent effect on intention to quit. The effect of education was only valid for those defined as having a high-income level. There was a 10–20 percentage point difference between high and low education level in relation to probability of high consumption, dependence, and no intention to quit.

Several studies confirm the importance of education for lack of smoking cessation and risk of smoking continuation [5, 19, 21, 27]. Possible explanations for the strong influence of education on smoking have included knowledge and cognitive resources, social networks, number of smokers and social norms regarding smoking in the social environment, health literacy, psychosocial stress, and health risk perceptions [28–30]. It has been suggested that education creates a culture that discourages smoking [31]. Being in a culture where smokers are in the minority and where norms against smoking dominate may make it easier for someone who smokes to quit. Stronger no-smoking norms among those with greater education may explain some of their lower risk of smoking continuation.

The strong association between education and smoking continuation may be ascribed to the association between delay discounting/impulsivity and education; several studies show that less educated individuals choose smaller, immediate rewards over larger, delayed rewards [32, 33]. This means that smoking would be valued more highly than future health. Current smokers discount delayed rewards more than never and former smokers and are more nicotine dependent than less dependent smokers, even when controlling for education [34, 35]. However, the association between education/income and nicotine dependence is stronger than the association between delay discounting and nicotine dependence [35]. A Norwegian study of adolescents found that both education and impulsivity predicted smoking initiation, but only education (not impulsivity) predicted smoking cessation. No interaction between education and impulsivity on smoking cessation was found [36].

The somewhat stronger relationship between education and smoking behaviour compared with income and smoking behaviour may vary by country [37]. Income had a curvilinear impact on high consumption. The high price of cigarettes in Norway may explain the low probability of high cigarette consumption in the low-income group, a finding in line with studies showing that low-SES groups are sensitive to increasing cigarette taxes [38]. However, this does not explain the low consumption levels among the high-income group in this study. Having low income may reduce cigarette consumption, but being financially deprived does not necessary imply an increased motivation to quit smoking.

Increases in the price of or tax on cigarettes are seen as having the most consistent positive impact, for example, the greatest potential to reduce inequality in smoking behaviour [38]. Interventions such as compulsory and national smoke-free policies and control on advertising, promotion and marketing of tobacco are regarded as having a positive or neutral impact; here, a neutral impact means that the effect would be equal regarding SES [38]. Norway scores relatively high on the cigarettes price score (20 out of 30 points) in the tobacco control scale in Europe [39]. Further tax increases are seen as problematic due to fear of increased cross-border trade with subsequent lost tax revenue and smuggling. Smoke-free legislation was introduced in Norway in 2004, with positive health effects among employees in the hospitality industry [40]. The impact of national smoke-free policies on reducing inequalities is found mainly in reduced social inequalities in passive smoking (nine out of 19 studies) [38]. Smoke-free legislation is expected to reduce the social acceptability of smoking, thereby contributing to the ongoing process of smoking denormalization. Whether denormalization processes have the same impact regardless of social status is unclear and highly debated (cf. the smoker stigma debate [41]).

Tobacco control interventions such as price/taxation increases and sales restrictions are considered highly effective because they affect most people. The population-level cessation support in Norway, with the exception of individual media campaigns that have been launched earlier, comprises a national quit line and a web site for smoking cessation support hosted by health authorities. Call rates to the quit line are higher among high-SES groups than low-SES groups and these SES differences are stable over time [42]. A study evaluating the Norwegian quit line is currently in progress. More intensive smoking cessation services implemented through the health care service with special focus on deprived areas have shown positive effects in reducing social inequality in smoking in England [43]. Reaching proportionally more low-SES smokers than high-SES smokers may compensate for the lower quit rates usually found in socially disadvantaged groups of smokers.

The present study results are consistent with others and show the need to increase motivation to quit and assist nicotine-dependent low-SES smokers to quit smoking. In addition, the present study has disentangled the effect of two SES measures (education and income) on three separate indicators of prolonged smoking. The results show substantial differences in motivation to quit between those with both high educational level and high income, compared with those with both low educational level and low income.

Many Western countries including Norway have made substantial progress in reducing smoking prevalence over the last two decades but have been unable to decrease social inequality in smoking behaviour. New population-based interventions are currently being debated, including plain packaging and harm reduction strategies such as use of electronic cigarettes. Given the high mortality rate from cigarette

smoking and its contribution to health inequality, interventions that reduce smoking rates in low-SES populations are needed. However, few population-based interventions with an equity impact beyond those already identified, including price and tax increases, exist. A report from the Royal College of Physicians states that harm reduction strategies, such as electronic cigarettes, may have a potential role in preventing deaths from cigarette smoking and reducing social inequalities in smoking-related morbidity and mortality [44]. Further investigation on the potential role of electronic cigarettes to reduce social inequality in smoking is needed, both to assess their potential for helping nicotine-dependent smokers to quit as well as their potential to increase motivation to quit among smokers unwilling to quit smoking.

Limitations

The cross-sectional design of this study makes it impossible to deduce causation. The validity of the outcome variables requires attention. Having high cigarette consumption, high cigarette dependence, and no intention to quit were used as indices of risk for smoking continuation. This is consistent with several studies reporting these measures in relation to unsuccessful cessation among hardcore smokers. In a longitudinal study, the predictive ability of high consumption, high dependence, and intention to quit was investigated in relation to continued smoking after 1 year. All components predicted smoking continuation, but nicotine dependence was the best predictor of smoking continuation [16].

Conflict of Interests

No conflict of interests exists.

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IV

Research article:

Exploring smokers' opposition to proposed tobacco control strategies

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Marianne Lund

Norwegian Institute of Public Health

Department of Alcohol, Drug and Tobacco Research

PO Box 4404, Nydalen, 0403 Oslo, Norway

Corresponding author: marianne.lund@fhi.no

Abstract

Background: Tobacco control (TC) advocates are searching for new TC strategies to decrease smoking rates further. *Aims:* The aim of this study was to explore opinions about 16 proposed TC strategies, including smokers' opposition to the proposals. The results are discussed both in relation to the justification of new TC strategies and to the need for public versus smokers' support. *Methods:* An Internet panel with 35,000 registered users was accessed to invite participants to join a survey on attitudes towards TC strategies. Of the 5,543 participants recruited, 5,250 adults aged 20 years or older were eligible for analysis. Respondents' attitudes were measured on a five-point Likert scale, and mean values, standard deviations and percentages of those who opposed TC regulations were reported. *Results:* In the total sample, there was some support for regulating smoking in specific outdoors areas. Smokers opposed all of the proposed strategies except banning smoking in cars carrying children, increasing the age limit for purchasing cigarettes, and banning smoking at transportation stops. Smokers seemed to accept regulations that protected others from the health risks of smoking, but defended their right to smoke in some specific outdoor areas. *Conclusion:* Smokers opposed most of the proposed TC strategies. Smokers' support may be more important in TC areas that aim to denormalize smoking, and where enforcement is more complex.

Introduction

Tobacco control (TC) strategies are important for reducing smoking prevalence. Different TC measures used in combination are claimed as the most effective (Levy, Chaloupka, & Gitchell, 2004; Zhang, Cowling, & Tang, 2010). Tax increases, smoke-free air laws, advertising restrictions and cessation treatment programmes are effective strategies for lowering smoking rates (Nagelhout et al., 2012).

Norway implemented an advertising ban on tobacco products in 1975, introduced a total ban on indoor smoking in the hospitality industry in 2004, and introduced a display ban on tobacco products in 2010. In partnership with the World Health Organization's Framework Convention on Tobacco Control (FCTC), a number of TC initiatives have been undertaken. Although Norway has implemented most of the strategies recommended by the FCTC, some methods have still not been applied, or are underused. In the last two years, the daily smoking prevalence has been stable at 13%, and occasional smoking has been stable at 9–10% for decades (Norwegian Institute for Alcohol and Drug Research, 2015). Norway has the statutory goal of being a tobacco-free society, and aims to reach a daily smoking prevalence of 10% by the end of 2016 (Ministry of Health and Care Services, 2014). To achieve the goal of a tobacco-free society, novel and radical TC strategies have been proposed. The so-called endgame strategies may be grouped into three overall aims: to reduce tobacco to a minimum; to end commercial sale of tobacco; and to denormalize smoking in society (Lykke, 2016). The concept of smoking denormalization has become a central part of TC instruments, and refers to strategies that aim to make cigarettes less desirable and less accessible, and the act of smoking less acceptable (Zhang et al., 2010).

The present paper presents several proposals for regulating smoking behaviour, which were suggested by the government and non-government organizations based on TC regulations in other countries. The strategies include reducing the accessibility of cigarettes by sales

restrictions, a radical proposal to ban the sale of cigarettes in 10 years, and strategies that aim to denormalize smoking by introducing outdoor smoking bans in specific areas.

Knowledge of public support for TC strategies is considered an important factor for two reasons: support may lead politicians to take action, and it is important for the successful implementation of TC (Wong, Pawson & Owen, 2011; Rabe, 2013). In addition, the size of the problem is an important justification for regulation, the possibility to enforce implemented regulations and the empirical evidence that the intervention will be effective.

The aims of this study were first to explore the public support for 16 proposed TC strategies, and to explore the degree of smokers' opposition to these strategies. Smokers will need to adjust their behaviour if these strategies are implemented, and successful implementation may depend on their support. The findings are discussed in relation to the importance of public versus smoker support, and the need for legitimate TC strategies, especially those aimed at denormalizing smoking behaviour.

Methods

Data and sampling procedure

A market research firm (Ipsos MMI) used its pool of 35,000 registered Internet panellists in Norway to invite participation in an Internet-based survey on public opinion towards TC strategies. The panel was randomly recruited via telephone lists (randomly selected within quotas set by gender, age or geography). A double opt-in procedure was used, whereby panellists gave background information when signing in, in addition to confirming their attendance by email. A total number of 4,291 panellists were recruited. A further 1,252 participants aged under 29 years were recruited directly from cellphone lists. A mixed-mode survey using Internet and telephone data makes it possible to reach a higher number of respondents (Dillman et al., 2009). The survey recruited 5,543 respondents in total. In the

present study, only respondents aged 20 years or older were included in the analysis (N = 5,250). Panel members over the age of 64 years were interviewed by computer-assisted telephone interviewing, those in the 25–64-year age group answered via the Internet, and the youngest via cellphone or the Internet.

Variables

Respondents' opinions towards proposed TC strategies were measured on a five-point Likert scale (1 = no support, 5 = full support). The introduction to the questions was as follows: "Several new tobacco control strategies may be implemented to reduce the health risk from tobacco smoking in society. What is your opinion if the government were to implement these regulations on smoking behaviour?" Smoking status was categorized as daily smoker, occasional smoker, former daily smoker and non-smoker.

Statistical analysis

Mean values (M) with standard deviations (SD) for each TC measure are reported, together with mean differences between daily smokers and non-smokers with independent sample *t* tests (Table 1). In addition, the percentages of those who strongly opposed TC regulation (value = 1, no support) are presented in Table 2, with test for statistical differences between daily and occasional smokers.

Results

In the total sample, the highest support was observed for banning smoking in cars carrying children (M = 4.47), followed by support for outdoor smoke-free air laws at transportation areas (M = 3.97) and at workplace entrances (M = 3.79). There was also some support for banning smoking in outdoor seating areas at restaurants and bars, although less than that given for transportation stops and outside workplaces. In the total sample, there was also some support for increased taxation and age limits for purchasing cigarettes. Overall, a total ban on selling

cigarettes in the next 10 years was met with more opposition than support (M = 2.87), but 19% had a neutral opinion in this matter (results not shown). In the total sample, there was more support for regulating smoking in outdoor settings than for regulation by sales restrictions.

As expected, there were significant differences in opinion by smoking status. The differences in mean scores between daily smokers and non-smokers were largest for the proposals of extending the smoking ban to outdoor seating areas in bars and restaurants, increasing taxes on cigarettes and prohibiting smoking in public parks. The TC strategies with the least disagreement between daily smokers and non-smokers were banning smoking in cars carrying children and increasing the age for purchasing cigarettes from 18 to 20 years (Table 1).

Table 2 presents the percentage of those opposed to the regulations (those who scored 1 = “no support” on the five-point Likert scale). In the total sample, opposition was reported for regulation of the sales of tax-free cigarettes, prohibition of sales from kiosks and petrol stations, restricting cigarette sales to pharmacies only, the introduction of plain packaging and a total sales ban.

Daily smokers opposed 13 of the 16 TC proposals, which meant that 50% or more reported no support for these items (Table 2). Of the daily smokers, 73.2% opposed the most radical proposition of banning smoking in 10 years. The corresponding number among occasional smokers was 50.8%. Significant differences in reporting strong opposition to TC were found between daily and occasional smokers on all items except for increasing the age limit for purchasing cigarettes and banning smoking in cars (Table 2).

Discussion

The main findings from this study were observed as support for banning smoking in specific outdoor settings, for an age increase for purchasing cigarettes and tax increases on cigarettes in

the total sample. Smokers only supported banning smoking in cars carrying children. Smokers showed a strong degree of opposition towards most of the proposed TC instruments.

Differences in attitudes between smokers and non-smokers have been reported by others, and are mainly described in terms of smokers' self-interests (Ashley et al., 2000; Dixon et al.,1991; Hersch, 2005; Lazuras et al., 2009; Green & Gerken, 1989). However, there are nuances in smokers' opposition, both between daily and occasional smokers, and regarding the type of regulation. For instance, the opposition against banning smoking in cars carrying children was low among both daily smokers and occasional smokers, and there was weak opposition to banning smoking at transportation stops and increasing the age limit for purchasing cigarettes. Support among smokers for banning smoking in cars carrying children has been reported by others (Hitchman et al., 2011; Wong et al., 2011).

Daily smokers were opposed to the proposal of a total sales ban on cigarettes in 10 years (73.2%), and the corresponding opposition in the total sample was 32.8%. Two studies on public opinions towards a total sales ban in other European countries report support rates between 35% and 45% (Gallus et al., 2014; Shabab & West 2010). The number of *supportive* respondents in the total sample in the present Norwegian data was 36% (value 4 and 5 on the Likert scale), not unlike the results from Gallus et al. The support among Norwegian current smokers was 20 %, compared to 26% in Gallus et al., and approximately 30% in England (Shabab and West, 2010). Caution must be taken in relation to comparing these results due to different design and measurements methods.

A central question is whether support from the public is considered to be sufficient, or whether support from smokers, the group that society demands a change from, is more important. As the prevalence of smoking declines, smokers become a minority group; therefore, their public "voice" is diminishing. Thus, public support becomes almost equivalent with non-smokers' opinions, and this group may easily support restrictions towards a behaviour they do

not engage in themselves. High discrepancies between smokers and non-smokers were found on the proposal to ban smoking at outdoor seating in bars and restaurants. In this area, smokers and non-smokers have a clear conflict of interest. On the one hand, smokers may feel they have already gone to great lengths to accommodate the indoor smoking ban required by the public. On the other hand, non-smokers may feel excluded from outdoor seating at some restaurants and bars. The outdoor seating areas are often enclosed and built-in to protect customers against rain, wind, and cold, leading to a high density of environmental tobacco smoke. Non-smokers may feel discomfort, and outdoor seating at some restaurants may become an inappropriate place for families to sit.

However, support from smokers may not be realistic because they want to protect their right to smoke. When smoking indoors was banned, there was support from the public, but not from smokers; the high level of compliance to the law after implementation showed that smokers were able to adapt (Lund, 2006). In this case, the justification for an indoor smoking ban was strong because of the risk of environmental smoke and the need to protect employees in the hospitality industry. In addition, there was support from the labour unions, and media campaigns were used to inform the public about the justification of the law before it was implemented. The strong justification of this ban were accepted by the smokers, and it is also probable that smokers did not experience this ban as a top-down approach, but rather as an important step in reducing health inequality by protecting employees in the hospitality industry.

It is unclear whether this successful implementation can be applied to banning smoking in specific outdoor settings. There is some evidence that high smoker density in enclosed outdoor areas generates high levels of environmental smoke, measured as particulate matter (Sureda et al., 2013). Banning smoking at outdoor seating in bars and restaurant may therefore have some justification in relation to the health risk of passive smoking in some cases. Beyond these conditions, the evidence of harm from cigarette smoking in outdoor settings is weak.

Evidence is strong for a high concentration of environmental tobacco smoke in cars, with subsequent health risks, especially for children (Evans & Chen, 2009; Rees & Connolly, 2006). The banning of smoking in cars carrying children was met by support from both non-smokers and smokers. TC interventions that include children in the context of passive smoking activate protective attitudes in smokers as well as non-smokers. Smokers regret starting to smoke, but do not want their children to take up smoking, and are therefore supportive of interventions targeting children (Diepeveen et al., 2013; Fong et al., 2004). In this aspect of TC, everyone seems to agree that the practice of smoking while driving and exposing children to the environmental smoke is unacceptable. Therefore, a high degree of compliance with such a ban is likely.

The arguments for banning smoking in outdoor settings are found mainly in the social denormalization approach, where reduced visibility of smoking is believed to make smoking less acceptable (Collins & Procter, 2011). The "out of sight, out of mind" strategy represents a shift in social norms, and is believed to be important for the prevention of smoking uptake among youth, and supportive for smokers who are trying to quit (Bloch & Shopland, 2000). To persuade smokers to regulate their behaviour based on the theory and documentation that underlie tobacco denormalization approaches seems to be much harder than to persuade smokers based on evidence-based research on the health consequences of smoking, including passive smoking.

For some types of outdoor regulations, smokers' opposition is less marked. A minority of daily smokers opposed regulation at transportation stops, and only two out of ten occasional smokers opposed this regulation. The concept of the "considerate smoker" illustrates the notion that smokers wish to retain public acceptance of their smoking, and are therefore willing to comply with the unwritten social norms and expectations relating to outdoor public spaces by moving away from non-smokers to light a cigarette (Poland, 2000). Smokers are aware that

their smoking may bother non-smokers, and report that they feel more comfortable smoking where non-smokers are absent (Kaufman et al., 2010). It is also possible that this type of regulation is not considered as a major intervention into the freedom of smokers. In contrast, smokers opposed the banning of smoking in public parks and gardens in addition to outdoor seating in bars and restaurants, which probably activates fear among smokers that "every space is claimed" by non-smoking norms (Bell et al.,2010).

However, there are TC strategies that could be successfully implemented without support from smokers, such as reducing accessibility to cigarettes, because they encompass the possibility of permanent structural changes and law enforcement. The biggest threat to reduced accessibility to cigarettes is possibly not a lack of support in the public, but powerful actors with economic interests. Examples here are duty-free sales, which are advocated as essential for the profitable operation of Norwegian airports, and lawsuits from the tobacco industry (TI) to the introduction of the display ban (Mikalsen, 2015; News.com.au, 2012).

Another example of TC strategies that may not need support in the public or among smokers for successful implementation is the introduction of plain packaging. The cigarette pack is considered an important part of the TI's marketing strategy, so removing cigarette brand images by introducing plain packaging is believed to have an effect on the appeal of the product. It is also believed that plain packaging will make the health warnings more prominent, and avoid misleading the public by creating false perceptions with colours and fashionable designs (McCool et al., 2012; Moodie et al., 2012). In the present sample, there was little support for introducing plain packaging in the total sample. The reason for this is not clear, but one possible explanation is lack of information about its TC potential. The justification of plain packaging may be more complex to communicate to the public because it is based on a mixture of theory and study design investigating smokers' and non-smokers' preferences.

Debates about public health intervention are related to the classic conflict between individual autonomy and freedom, and the desire to promote health and protect third parties from health risks. The strong negative health impact, along with the economic and social costs, has been used to justify reduced availability of cigarettes, product regulation and laws to reduce the harm caused by passive smoking. The justification to continue along this path still exists. However, there are reasons to believe that regulations without a clear scientific evidence for the health risk to others may be difficult to find support for, especially among smokers.

The ethical justification of the outdoor smoking ban is disputable (Chapman, 2000). Some argue that banning outdoor smoking is a major intervention in the autonomy of the smoker, that such interventions need to be supported by scientific argument of health risk to others, and that the argument that smoking is an unwanted behaviour annoying non-smokers is not enough to build policy upon (Chapman, 2000). Another problem with the outdoor smoking ban is the absence of enforcement measures; policing of the outdoor smoking ban would be left to the lay public (Poland, 2000).

At present, further regulations in the accessibility of cigarettes, regulation of smoking in specific outdoor settings and banning smoking in 10 years are met with resistance among smokers. Daily smokers resist the proposals more than occasional smokers do. The vision of a tobacco-free society does not seem to have reached a legitimate status among smokers or non-smokers. This may be because the public does not see a clear plan for driving the smoking rates toward zero levels, the proposals are seen as unrealistic to implement, and/or ethical considerations may be a barrier for support. Both the public and smokers support TC strategies based on legitimate scientific evidence of the effects of passive smoking, and which imply protection of vulnerable groups in society. TC strategies related to social denormalization, such as the banning of smoking in parks, do not seem to have reached similar levels of legitimacy in the public view. The dilemma for TC policy highlighting a denormalization approach with its

primary goal of creating a social milieu in which smoking becomes less desirable and less socially acceptable, is to convince the smokers that this approach is possible without stigmatizing smokers (Bayer & Bachynski, 2012). A clear distinction between the act of smoking and the smoker needs to be drawn to avoid stigmatizing processes. Support from smokers may be more important for successful implementation in areas of TC that rely on social denormalization, where enforcement is low and where successful implementation is left to the lay public and compliance by smokers. TC at a structural level, reducing the accessibility to cigarettes, is possible less stigmatizing, and may not be dependent by support from smokers to be effective.

Strengths and limitations

The use of Internet-based data provided the opportunity to accumulate a large volume of responses in a short time, including a large enough group of smokers. It is also likely that Internet-based data are more suitable for measuring behaviours with a negative social perception, such as smoking status, to avoid social desirability bias. Shortcomings in the present data are mainly related to uncertainty regarding representativeness. Characteristics of non-respondents in the survey were not available in this study, and whether non-response was systematic or random is unknown.

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Table 1
Attitudes towards proposed tobacco control strategies. Mean (SD). Five-point Likert scale (1 = no support, 5 = full support). Differences between daily smokers and non-smokers. Respondents were aged 20 years or older.

	Daily smokers N = 541	Occasional smokers N = 532	Former daily smoker N = 1 700	Non-smokers N = 2 477	Total N = 5 250	Difference: daily smokers vs. non-smokers
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	
Remove duty-free quota on cigarettes completely when entering Norway	1.34 (0.93)	2.01 (1.42)	2.81 (1.70)	3.42 (1.60)	2.86 (1.70)	2.08*
Increase cigarette taxes	1.45 (1.01)	2.34 (1.52)	3.29 (1.61)	3.83 (1.40)	3.26 (1.64)	2.38*
Reduce the number of cigarette outlets	1.47 (0.97)	2.18 (1.43)	2.89 (1.61)	3.39 (1.53)	2.90 (1.62)	1.93*
Prohibit cigarette sales at petrol stations and kiosks	1.36 (0.89)	1.94 (1.30)	2.72 (1.62)	3.21 (1.56)	2.73 (1.62)	1.85*
Prohibit cigarette sales at festivals, concerts and other cultural events	1.67 (1.15)	2.17 (1.43)	3.06 (1.66)	3.55 (1.53)	3.06 (1.65)	1.88*
Allow cigarette sales only at grocery stores, similar to the regulation for the sale of beer	1.71 (1.19)	2.19 (1.41)	2.92 (1.60)	3.36 (1.51)	2.93 (1.60)	1.65*
Give exclusive rights to pharmacies to sell cigarettes	1.23 (0.71)	1.63 (1.17)	2.04 (1.46)	2.49 (1.57)	2.13 (1.49)	1.26*
Increase age for purchasing cigarettes from 18 to 20 years	2.49 (1.58)	2.75 (1.63)	3.14 (1.66)	3.51 (1.59)	3.21 (1.65)	1.03*
Introduce plain packaging regulation	1.49 (1.01)	2.13 (1.42)	2.61 (1.60)	3.10 (1.56)	2.68 (1.59)	1.62*
Prohibit all cigarette sales within 10 years	1.56 (1.08)	2.15 (1.42)	2.92 (1.61)	3.27 (1.55)	2.87 (1.62)	1.71*
Prohibit smoking at (outside) roofed stands for buses, trains, boats, trams and taxis	2.50 (1.50)	3.31 (1.60)	4.03 (1.39)	4.38 1.14)	3.97 (1.44)	1.88*
Prohibit smoking in public parks/gardens	1.47 (0.97)	2.10 (1.38)	3.08 (1.64)	3.66 (1.47)	3.09 (1.64)	2.19*
Prohibit smoking at entrances to all workplaces	2.17 (1.41)	3.01 (1.57)	3.85 (1.49)	4.28 (1.21)	3.79 (1.52)	2.11*
Extend the smoking ban to outdoor seating areas in restaurants	1.37 (0.87)	2.09 (1.40)	3.20 (1.63)	3.89 (1.40)	3.23 (1.66)	2.52*
Extend the smoking ban to outdoor seating areas in bars	1.34 (0.84)	1.97 (1.35)	3.15 (1.64)	3.80 (1.43)	3.15 (1.67)	2.46*
Prohibit smoking in cars when children are present	4.05 (1.43)	4.25 (1.30)	4.51 (1.12)	4.59 (1.00)	4.47 (1.14)	0.55*

*p-value (2-tailed) < .001

Table 2

Attitudes towards proposed tobacco control strategies. Percentage opposing (1 = no support) tobacco control strategies. Respondents were aged 20 years or older.

	Daily smokers N = 541	Occasional smokers N = 532	Former daily smokers N = 1,700	Non-smokers N = 2,477	Total N = 5,250	Significant difference: daily vs. occasional
	%	%	%	%	%	p -value
Remove duty-free quota on cigarettes completely when entering Norway	82.1	56.2	36.9	21.6	36.6	.000
Increase cigarette taxes	79.1	46.6	24.4	11.8	26.4	.000
Reduce the number of cigarette outlets	76.0	50.0	32.7	18.8	32.3	.000
Prohibit cigarette sales at petrol stations and kiosks	81.1	58.1	36.9	22.9	37.0	.000
Prohibit cigarette sales at festivals, concerts and other cultural events	68.4	49.8	29.5	17.0	29.7	.000
Allow cigarette sales only at grocery stores, similar to the regulation for the sale of beer	67.7	49.8	31.0	19.0	31.0	.000
Give exclusive rights to pharmacies to sell cigarettes	87.4	71.4	58.9	43.0	55.6	.000
Increase age for purchasing cigarettes from 18 to 20 years	44.4	36.7	28.5	20.2	27.0	.042
Introduce plain packaging regulation	76.5	51.3	40.4	24.1	37.6	.000
Prohibit all cigarette sales within 10 years	73.2	50.8	31.4	21.1	32.8	.000
Prohibit smoking at (outside) roofed stands for buses, trains, boats, trams and taxis	39.9	22.0	10.8	5.0	12.2	.000
Prohibit smoking in public parks/gardens	76.0	50.4	28.6	13.8	28.7	.000
Prohibit smoking at entrances to all workplaces	49.5	26.9	14.1	6.5	15.4	.000
Extend the smoking ban to outdoor seating areas in restaurants	79.7	52.4	25.2	11.1	26.9	.000
Extend the smoking ban to outdoor seating areas in bars	81.3	56.8	26.5	12.4	28.6	.000
Prohibit smoking in cars when children are present	12.4	8.6	6.2	4.3	6.2	.135

Appendix

Appendix

Appendix 1: Questions from the Norwegian Tobacco Survey (in Norwegian)

Tob1. Så kommer det noen spørsmål om røyking. Hender det at du røyker?

Ja/Nei

Hvis Tob1 = Ja

Tob2.Røyker du daglig eller av og til?

Daglig

Av og til

Tob3-Tob13 stilles hvis Tob2 = Av og til

Tob3. Røyker du sigaretter? Regn med både fabrikklagede og hjemmerullede

Ja/Nei

Hvis Tob3 = Ja stilles Tob4 - Tob6

Tob4a. Hvor mange sigaretter røyker du anslagsvis per uke? BÅDE FABRIKKLAGDE OG HJEMMERULLEDE

Tob9.Har du noen gang prøvd å slutte med av-og-til-røykingen?

Ja/Nei

Hvis Tob9 = Ja stilles Tob10-Tob11

Tob10.Hvor mange ganger har du forsøkt å slutte?

Tob11 Har du noen gang i løpet av de siste 12 måneder forsøkt å slutte med av-og-til-røykingen?

Ja/Nei

Hvis Tob2 = "av og til" stilles Tob13

Tob13.Har du noen gang røykt daglig?

Ja/Nei

Hvis Tob1 = Nei (IKKE-RØYKERE) stilles Tob14

Tob14.Har du noen gang røykt daglig eller av og til?

1. Ja, daglig
2. Ja, av og til
3. Nei, aldri

Hvis Tob2 = Daglig stilles Tob30 - Tob42k (Dagligrøykere)

Tob31a.Hvor mange sigaretter røyker du gjennomsnittlig pr. dag? Regn med både fabrikklagede og hjemmerullede

Tob38.Har du noen gang prøvd å slutte å røyke daglig?

Ja/Nei

Tob40.Prøvde du noen gang i løpet av de siste 12 månedene å slutte å røyke daglig?

Ja/Nei

Hvis Tob1 = 1 (daglig og av-og-til-røykere)

Tob43.Vurderer du seriøst å slutte å røyke de neste 6 månedene?

Ja/Nei

Tobvan1.Hvor lang tid etter at du våkner, tenner du din første sigarett Regn også med de som røyker pipe og/eller sigar?

1. Innen 5 min er gått.
2. Mellom 6 - 30 min.
3. Mellom 31 - 60 min.
4. Etter at 60 min. er gått.

Tob61.Kan du prøve å forutsi dine røykevaner omkring 5 år fra nå? Hvilket av følgende svar passer best?

1. Kommer helt sikkert til å røyke daglig
2. Kommer antakelig til å røyke daglig
3. Kommer antakelig ikke til å røyke daglig
4. Kommer helt sikkert ikke til å røyke daglig

Tob60.Bruker du snus daglig, av og til eller aldri?

1. Daglig
2. Av og til
3. Aldri

Appendix 2: Supplementary table, paper 2.

Supplementary table 1: Components loading of 16 evaluation items on smoking and snus use. Principal component analysis with oblimin rotation.

	Component 1 Self-evaluative emotions		Component 2 Benefits from quitting		Component 3 Social judgment		Component 4 Moral judgment	
	Smoking	Snus	Smoking	Snus	Smoking	Snus	Smoking	Snus
I am dissatisfied with myself because of my snus use/smoking	0.86	0.86	-0.07	0.03	-0.03	0.00	-0.03	-0.01
I am embarrassed because I am using snus/smoking	0.82	0.72	0.10	-0.11	0.06	0.10	0.18	-0.25
I have bad conscience because I am using snus/smoking	0.89	0.90	-0.04	0.03	-0.04	-0.01	0.00	0.01
I feel angry with myself because I am using snus/smoking	0.89	0.87	-0.01	-0.03	-0.04	0.05	0.01	0.02
I have guilt because I am using snus/smoking	0.89	0.84	0.04	-0.06	0.01	0.07	0.07	-0.07
I regret that I started to use snus/smoke	0.56	0.73	-0.27	0.22	0.04	-0.08	-0.21	0.15
Snus use/smoking is unethical	-0,03	0.16	-0.07	0.12	-0.05	0.23	0.85	-0.44
Snus use/smoking is disgusting	0,05	0.01	-0.18	0.14	-0.03	-0.03	0.72	-0.81
I try to hide my snus use/smoking when meeting people I do not know	0,28	0.25	0.14	-0.10	0.17	0.25	0.50	-0.46
Non-users of tobacco despises us who use snus/smoke	-0,09	-0.02	-0.01	0.02	0.86	0.75	-0.01	-0.14
I feel that there is a strong social pressure towards quitting with snus/smoking	-0,03	-0.02	-0.02	0.05	0.83	0.89	-0.10	0.17
I feel that other people view my snus use/smoking as a personal weakness	0.23	0.18	-0.03	0.05	0.51	0.61	0.25	-0.15
If I quit snus/cigarettes my physical shape will improve	0.04	0.05	-0.79	0.82	0.05	0.06	-0.12	0.15
If I quit snus/cigarettes the risk of getting CVD will be reduced	0.05	-0.01	-0.77	0.80	0.00	0.10	-0.07	0.01
If I quit snus/cigarettes I will become a better role model	0,07	0.21	-0.67	0.56	-0.01	-0.11	0.27	-0.17
If I quit snus/cigarettes people around me will be more satisfied	-0,02	-0.05	-0.72	0.63	0.02	0.04	0.23	-0.31
Eigenvalue (initial)	6.30	7.07	1.69	1.52	1.44	1.33	1.19	0.79
% of variance	39.39	44.21	10.53	9.50	9.03	8.29	7.43	4.94

Appendix 3: Questionnaire used in paper 4.

startdato	Dato
◆ **afilla:**sys_date c Dato	☐☐☐☐☐☐☐☐ 1

start	Starttidspunkt
◆ **afilla:**sys_timestartf c Starttidspunkt	☐☐☐☐☐☐ 1

SID	SID from IIS
	Open

iisID	IIS panelist ID
	Open

iisID_1	IIS panelist ID
	Open

uke	Uke
◆ **afilla:**sys_week c Uke	☐☐ 1

ukedag	Ukedag
◆ **afilla:**sys_dayofweek c Ukedag	☐ 1

browser	Browser
	Open

kjonn	AUTO UTFYLLING **Kjønn**
◆ **range:***	
Mann	○ 1
Kvinne	○ 2

alder	AUTO UTFYLLING **Hva er din alder?**
◆ **afilla:**sms_ICALIndage c	☐☐ 1

fylke	AUTO UTFYLLING **Hvilket fylke bor du i?**
◆ **range:***	
Østfold	○ 1

fylke	AUTO UTFYLLING **Hvilket fylke bor du i?**	
Akershus	○	2
Oslo	○	3
Hedmark	○	4
Oppland	○	5
Buskerud	○	6
Vestfold	○	7
Telemark	○	8
Aust-Agder	○	9
Vest-Agder	○	10
Rogaland	○	11
Hordaland	○	12
Ubenyttet	○	13
Sogn og Fjordane	○	14
Møre og Romsdal	○	15
Sør-Trøndelag	○	16
Nord-Trøndelag	○	17
Nordland	○	18
Troms	○	19
Finnmark	○	20

utd	AUTO UTFYLLING **Hva er din høyeste fullførte utdannelse?**	
◆ **range:***		
Folkeskolenivå (Inntil 8 års skolegang)	○	1
Ungdomsskole/ Realskolenivå (9-10 års skolegang)	○	2
Videregående skole/ Gymnasnivå (11-13 års skolegang)	○	3
Universitetsnivå (Mer enn 12 års skolegang + studier)	○	4
Er under utdanning	○	5
Universitet/ høyskole, lavere grad	○	6
Universitet/ høyskole, høyere grad	○	7

innt_IIS	Hva er husstandens samlede bruttoinntekt?	
◆ **range:***		
Inntil kr 300.000	○	1
Kr. 300.-499.999	○	2
Kr. 500.-799.999	○	3
Kr. 800.-999.999	○	4
Kr. 1.000.-1.499.000	○	5
Over 1.500.000	○	6
Vil ikke oppgi	○	7
Vet ikke	○	8

postnr	AUTO UTFYLLING Hva er ditt postnummer?	
◆ **afilla:**sms_ZipCode c	☐☐☐☐	1

sentralitet	AUTO UTFYLLING Hvor bor du?	
◆ **range:***		
Stor by	○	1
Mindre by	○	2
Tettsted	○	3
På landet	○	4

eieform	AUTO UTFYLLING Eierform	
◆ **range:***		
Leid bolig	○	1
Selveierbolig	○	2
Borettslagbolig	○	3
Annet/ Vet ikke	○	4

boligtype	AUTO UTFYLLING Hvilken type bolig bor du i?	
◆ **range:***		
Leilighet	○	1
Hybel	○	2
Enebolig	○	3
Rekkehus	○	4

boligtype	AUTO UTFYLLING **Hvilken type bolig bor du i?**	
Bofellesskap		○ 5
Annet/vet ikke		○ 6

personer	AUTO UTFYLLING **Hvor mange personer bor det i husstanden?**	
◆ **range:***		
1 person		○ 1
2 personer		○ 2
3 personer		○ 3
4 personer		○ 4
5 personer		○ 5
6 personer		○ 6
7 personer		○ 7
8 personer		○ 8
9 personer eller flere		○ 9
Ikke oppgitt		○ 10

sivilstand	AUTO UTFYLLING **Hva er din sivilstand?**	
◆ **range:***		
Gift/Samboende/par		○ 1
Samboende med venner		○ 2
Enslig		○ 3
Bor hos foreldre		○ 4

barn	AUTO UTFYLLING **Hvor mange hjemmeboende barn under 18 år er det i husstanden?**	
◆ **afilla:**sms_CEENbChildren c Antall		☐ 1

nbchildren	AUTO UTFYLLING **Hvor mange hjemmeboende barn under 18 år er det i husstanden?**	
Null		○ 1
1		○ 2
2		○ 3
3		○ 4

nbchildren	AUTO UTFYLLING **Hvor mange hjemmeboende barn under 18 år er det i husstanden?**
4 or more	○ 5

source	AUTO UTFYLLING **Origin of respondent - All panel respondents need to be uploaded with source=1**
◆ **range:***	
Panel	○ 1
New recruits	○ 2

Information

ID:alle1

q1	Myndighetene har innført flere tiltak for å få færre til å røyke eller beskytte mot passiv røyking. Hvordan er din tilslutning til følgende tiltak?					
◆ **range:***						
	1 - Ingen støtte	2	3	4	5 - Full støtte	
	1	2	3	4	5	
◆ **rot:**r						
Forbudet mot å reklamere for tobakksvarer	○	○	○	○	○	1
Forbudet mot å ha tobakksvarer synlig i butikker, kiosker og andre salgssteder	○	○	○	○	○	2
Påbudet om at alle elever til og med videregående skole skal være røykfrie i skoletiden	○	○	○	○	○	3

q2	Flere nye tiltak kan bli aktuelle for å redusere tobakkskadene i samfunnet. Hvordan vil du stille deg dersom myndighetene skulle foreslå disse tiltakene mot røyking?					
◆ **range:***						
	1 - Ingen støtte	2	3	4	5 - Full støtte	
	1	2	3	4	5	
◆ **rot:**r						
Heve aldersgrensen for å kjøpe sigaretter og røyketobakk fra 18 år til 20 år	○	○	○	○	○	1
Redusere taxfree-kvoten for innførsel av sigaretter og røyketobakk ved utenlandsreiser	○	○	○	○	○	2
Oppheve muligheten til å ta med avgiftsfri sigaretter og røyketobakk inn i landet ved utenlandsreiser	○	○	○	○	○	3
Fjerne adgangen til taxfreekjøp av sigaretter og røyketobakk ved ankomst på flyplasser i Norge	○	○	○	○	○	4
Halvere antall utsalgssteder for salg av sigaretter og røyketobakk	○	○	○	○	○	5
Forby salg av sigaretter og røyketobakk fra bensinstasjoner, kiosker og lignende	○	○	○	○	○	6
Forby salg av sigaretter og røyketobakk på festivaler og andre kulturarrangementer	○	○	○	○	○	7
Tillate salg av sigaretter og røyketobakk kun for dagligvareforretninger, på samme måte som det er gjort for øl	○	○	○	○	○	8
Forby kjøp av sigaretter og røyketobakk over internett	○	○	○	○	○	9
Forbud mot at produsentene selv kan bestemme hvordan røykpakkene skal se ut når det	○	○	○	○	○	10

q2	Flere nye tiltak kan bli aktuelle for å redusere tobakkskadene i samfunnet. Hvordan vil du stille deg dersom myndighetene skulle foreslå disse tiltakene mot røyking?					
gjelder farge, design, logo og annen merking						
Påbud om standardiserte røykpakker, dvs. at alle må ha lik farge og utforming	○	○	○	○	○	11
Forbud mot smakstilsetninger i sigaretter, slik som mentol, vanilje, tuttifrutti osv.	○	○	○	○	○	12
Gi apotekene enerett til salg av sigaretter og røyketobakk	○	○	○	○	○	13
Forby salg av sigaretter og røyketobakk om ti år	○	○	○	○	○	14
Øke avgiften for sigaretter	○	○	○	○	○	15

q3	Her er flere nye tiltak som kan bli aktuelle for å redusere tobakkskadene i samfunnet. Hvordan vil du stille deg dersom myndighetene skulle foreslå disse tiltakene mot røyking?					
◆ **range:***						
	1 - Ingen støtte	2	3	4	5 - Full støtte	
	1	2	3	4	5	
Forby røyking i overbygde holdeplasser eller stasjoner for buss, båt, trikk, tog, taxi og lignende	○	○	○	○	○	1
Forby røyking i alle offentlige parker	○	○	○	○	○	2
Forby røyking ved utendørs inngangspartier til alle arbeidsplasser	○	○	○	○	○	3
Utvide røykeforbudet til uteserveringer på restauranter	○	○	○	○	○	4
Utvide røykeforbudet til uteserveringer på puber og barer	○	○	○	○	○	5
Forby røyking i biler hvor barn er passasjerer	○	○	○	○	○	6
Forby røyking på private balkonger i tilfeller der det plager naboen	○	○	○	○	○	7
Pålegge lærere i grunnskolen å være røykfrie så lenge skoledagen varer	○	○	○	○	○	8
Pålegge lærere i videregående skole å være røykfrie så lenge skoledagen varer	○	○	○	○	○	9
Forby bruk av elektroniske sigaretter i lokaler hvor det er røykeforbud	○	○	○	○	○	10

q4	Myndighetene har innført flere tiltak for å få færre til å bruke snus. Hvordan er din tilslutning til tiltaket som er nevnt nedenfor?				
◆ **range:***					
	1 - Ingen støtte	2	3	4	5 - Full støtte
	1	2	3	4	5

q4	Myndighetene har innført flere tiltak for å få færre til å bruke snus. Hvordan er din tilslutning til tiltaket som er nevnt nedenfor?					
◆ **rot:**n						
Påbudet om at alle elever til og med videregående skole skal være snusfrie i skoletiden	○	○	○	○	○	1

q5	Flere nye tiltak kan bli aktuelle for å redusere tobakkskadene i samfunnet. Hvordan vil du stille deg dersom myndighetene skulle foreslå disse tiltakene mot snusbruk?					
◆ **range:***						
	1 - Ingen støtte	2	3	4	5 - Full støtte	
	1	2	3	4	5	
◆ **rot:**r						
Heve aldersgrensen for å kjøpe snus fra 18 år til 20 år	○	○	○	○	○	1
Redusere taxfree-kvoten for innførsel av snus ved utenlandsreiser	○	○	○	○	○	2
Oppheve muligheten til å ta med avgiftsfri snus inn i landet ved utenlandsreiser	○	○	○	○	○	3
Fjerne adgangen til taxfreekjøp av snus ved ankomst på flyplasser i Norge	○	○	○	○	○	4
Halvere antall utsalgssteder for salg av snus	○	○	○	○	○	5
Forby salg av snus fra bensinstasjoner, kiosker og lignende	○	○	○	○	○	6
Forby salg av snus på festivaler og andre kulturarrangementer	○	○	○	○	○	7
Tillate salg av snus kun for dagligvareforretninger, på samme måte som det er gjort for øl	○	○	○	○	○	8
Forby kjøp av snus over internett	○	○	○	○	○	9
Forbud mot at produsentene selv kan bestemme hvordan snusboksene skal se ut når det gjelder farge, design, logo og annen merking	○	○	○	○	○	10
Påbud om standardiserte snusbokser, dvs. at alle må ha lik farge og utforming	○	○	○	○	○	11
Forbud mot smakstilsetninger i snus, slik som sjokolade, blåbær, mint osv.	○	○	○	○	○	12
Gi apotekene enerett til salg av snus	○	○	○	○	○	13
Forby salg av snus om ti år	○	○	○	○	○	14
Øke avgiften for snus	○	○	○	○	○	15
Pålegge lærere i grunnskolen å være snusfrie så lenge arbeidsdagen varer	○	○	○	○	○	16

q5	Flere nye tiltak kan bli aktuelle for å redusere tobakkskadene i samfunnet. Hvordan vil du stille deg dersom myndighetene skulle foreslå disse tiltakene mot snusbruk?					
Pålegge lærere i videregående skole å være snusfrie så lenge skoledagen varer	○	○	○	○	○	17

q6	Sammenlignet med daglig sigarettrøyking, hvor alvorlig mener du helseeffekten er ved daglig bruk av snus?	
◆ **range:***		
◆ **rot:**n Mye mer skadelig	○	1
Noe mer skadelig	○	2
Omtrent like skadelig	○	3
Noe mindre skadelig	○	4
Mye mindre skadelig	○	5
Vet ikke / Usikker	○	6

q7	Her er noen påstander om den internasjonale tobakksindustrien. I hvilken grad mener du disse påstandene er riktige?					
◆ **range:***						
	1 - Usant 1	2 2	3 3	4 4	5 - Helt sant 5	
◆ **rot:**r Den internasjonale tobakksindustrien har politisk innflytelse i Norge	○	○	○	○	○	1
Internasjonale sigarettprodusenter markedsfører seg aktivt mot ungdom i Norge	○	○	○	○	○	2
Internasjonale snusprodusenter markedsfører seg aktivt mot ungdom i Norge	○	○	○	○	○	3
Den internasjonale tobakksindustrien unngår reklameforbudet mot tobakk ved for eksempel produktplassering i film, media og lignende	○	○	○	○	○	4
Sigarettpakkers design (f.eks. farger, varemerke, utforming) er utviklet for å appellere til ungdom	○	○	○	○	○	5
Sigaretter og annen røyketobakk med smakstilsetninger, som f.eks. mentol og vanilje, er laget for å appellere til ungdom	○	○	○	○	○	6
Snusboksers design (f.eks. farger, varemerke, utforming) er utviklet for å appellere til ungdom	○	○	○	○	○	7
Snus med smakstilsetninger, som f.eks. sjokolade og blåbær, er laget for å appellere til ungdom	○	○	○	○	○	8

q8	Hvor stor tillit har du til den internasjonale tobakksindustrien?	
◆ **range:***		
◆ **rot:**n 1 - Ingen tillit		○ 1
2		○ 2
3		○ 3
4		○ 4
5		○ 5
6		○ 6
7 - Full tillit		○ 7

q9	Bruker du snus?	
◆ **range:***		
◆ **rot:**n Ja, daglig		○ 1
Ja, av og til		○ 2
Nei, aldri		○ 3

q10	Hva er dine røykevaner nå?	
◆ **range:***		
◆ **rot:**n Røyker daglig		○ 1
Røyker av og til		○ 2
Røyker aldri		○ 3

q11	Har du noen gang røykt daglig?	
◆ **filter:**\q10=2 ◆ **range:***		
◆ **rot:**n Ja		○ 1
Nei		○ 2

ID:smokers
filter:\q10=1

q12	Hvor lang tid etter at du våkner tenner du din første sigarett?	
◆ **range:***		
◆ **rot:**n Innen 5 minutter er gått	○	1
Mellom 6-30 minutter	○	2
Mellom en halvtime og en time	○	3
Etter at en time er gått	○	4

q13	Vurderer du seriøst å slutte å røyke i løpet av de neste 6 månedene?	
◆ **range:***		
◆ **rot:**n Ja	○	1
Nei	○	2

q14	Har du forsøkt å slutte å røyke i løpet av det siste året?	
◆ **range:***		
◆ **rot:**n Ja	○	1
Nei	○	2

q15	Dersom du prøver å forutsi dine røykevaner omkring 5 år fra nå - hvilket av følgende svar tror du vil passe best?	
◆ **range:***		
◆ **rot:**n Kommer helt sikkert til å røyke daglig	○	1
Kommer antakelig til å røyke daglig	○	2
Kommer antakelig ikke til å røyke daglig	○	3
Kommer helt sikkert ikke til å røyke daglig	○	4

q16	Ca hvor mange sigaretter røyker du per dag?	
◆ **range:**1:99		
Skriv inn ca. antall (skriv kun tall):	☐☐	1

ID:alle2

q17	Har du hørt om elektroniske sigaretter, såkalte e-sigaretter?	
◆ **range:***		
◆ **rot:**n Ja	○	1
Nei	○	2

q18	Har du prøvd e-sigaretter?	
◆ **filter:**\q17=1 ◆ **range:***		
◆ **rot:**n Ja	○	1
Nei	○	2

q19	Bruker du e-sigaretter…	
◆ **filter:**\q18=1 ◆ **range:***		
◆ **rot:**n Regelmessig, dvs ukentlig eller oftere	○	1
Av og til, men sjeldnere enn hver uke	○	2
Eller har kun prøvd det en eller noen få ganger	○	3

q20	Kunne du tenke deg å begynne å bruke elektroniske sigaretter?	
◆ **filter:**\q18=2 ◆ **range:***		
◆ **rot:**n Ja	○	1
Nei	○	2

q21	Hvordan vil du stille deg dersom myndighetene skulle foreslå disse tiltakene mot e-sigaretter?					
◆ **filter:**\q17=1 ◆ **range:***						
	1 - Ingen støtte	2	3	4	5 - Full støtte	
	1	2	3	4	5	
◆ **rot:**n Heve aldersgrensen for å kjøpe e-sigaretter fra 18 år til 20 år	○	○	○	○	○	1
◆ **rot:**n Forby kjøp av e-sigaretter over internett	○	○	○	○	○	2
◆ **rot:**n Gi apotekene enerett til salg av e-sigaretter	○	○	○	○	○	3

q21	Hvordan vil du stille deg dersom myndighetene skulle foreslå disse tiltakene mot e-sigaretter?					
◆ **rot:**n Forby salg av e-sigaretter i Norge	○	○	○	○	○	4
◆ **rot:**n Øke avgiften for e-sigaretter	○	○	○	○	○	5

ID:cawi_end

AlderFordeling	Alder	
◆ **range:**1 when \alder.1=17:29 2 when \alder.1=30:39 3 when \alder.1=40:59 4 when \alder.1=60:99		
18-29 år	○	1
30-39 år	○	2
40-59 år	○	3
60 år +	○	4

Komplett	Komplett	
◆ **range:**1		
OK	☐	1

Screened	Screened	
◆ **filter:**!\Komplett=1 ◆ **range:**1		
OK	☐	1

sluttid	Sluttid	
◆ **afilla:**sys_timenowf c Sluttidspunkt	☐☐☐☐☐☐	1

sluttdato	Sluttdato	
◆ **afilla:**sys_date c Sluttdato	☐☐☐☐☐☐☐☐	1

Information