

Evaluation of the Norwegian Tobacco Control Programme  
from 2003 to 2007  
Report No. 13 from HEMIL/SIRUS

**Smoke-free hospitality venues**  
**Summary report from a prospective survey among**  
**employees in the hospitality industry**

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## FOREWORD

The Norwegian Institute for Alcohol and Drug Research (SIRUS) and the Research Centre for Health Promotion<sup>1</sup> (HEMIL), University of Bergen, have been commissioned to evaluate the authorities' overall efforts to prevent tobacco-related diseases from 2003 to 2007. The results will generally be published as articles in national and international professional journals. In addition, selected excerpts of the results will be published on an ongoing basis in a series of reports intended to present the findings in a faster, more accessible manner than is usually the case with scientific publications. The present report is part of that series.

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Bergen, September 2007

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<sup>1</sup> The HEMIL Centre is organised under the Faculty of Psychology at the University of Bergen. The Centre is involved in teaching programmes at bachelor, masters and PhD levels. The research projects focus on issues associated with preventive and health-promoting efforts (including the evaluation of measures), health-related behaviour, the impact of the local environment on health and well-being, bullying/victimisation, antisocial behaviour and health policies. The Centre also engages in research on preventive and health-promoting efforts in developing countries. Since 1990, HEMIL has been designated as a Collaborating Centre by the World Health Organization.

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## **SUMMARY**

On 1 June 2004, an amendment to the Act relating to the Harmful Effects of Tobacco (the Tobacco Act) made smoking illegal in restaurants, pubs and all other businesses in the hospitality industry. This gave employees in the hospitality industry a smoke-free working environment, a right the majority of workers in Norway have enjoyed since 1988.

A large-scale evaluation of Norwegian tobacco control policies for the period from 2003 to 2007 is currently being conducted. The present one-year panel study on a national representative sample of employees in the hospitality industry is one of the components of that evaluation. The study is being conducted by the Research Centre for Health Promotion (HEMIL), University of Bergen, on behalf of the Norwegian Directorate for Health and Social Affairs (SHdir). This report is based on data from the baseline survey made in May 2004, and two follow-up surveys conducted in September/October 2004 and May 2005, respectively.

The present report gives an overview of results concerning smoking behaviour, attitudes to and expectations of the ban, lessons learned about enforcement, air quality in bars and restaurants and, finally, health complaints among employees. One of the main aims of the current report is to examine whether changes found in connection with the first follow-up had persisted, weakened or increased by the time of the second follow-up survey.

The results reveal a significant reduction in the percentage of employees who report being daily smokers from the baseline measurement to the first and second follow-up measurements (4.6 and 3.5 percentage points, respectively). Further, there has been a reduction in the daily cigarette consumption of employees who smoke, which is equivalent to a decrease of 1.36 cigarettes from before to one year after the baseline measurement. The percentage of employees reporting that they have a positive attitude to the ban on smoking in bars and restaurants increased from 48.5% at the baseline measurement to 59.8% one year later. This increase was most pronounced in the interim between the two follow-up measurements. Furthermore, the present study indicates a substantial increase in compliance with the total ban at both follow-up measurements, compared with the former arrangement featuring smoking and non-smoking zones. However, there was a small increase in the percentage of employees (4 percentage points) reporting breaches of the ban

from the first to the second follow-up. Finally, the present study reveals a substantial and lasting improvement in the subjective air quality in bars and restaurants. In addition, there has been a lasting reduction in the majority of general and respiratory health complaints of employees from before to after the introduction of the ban.

## 1. BACKGROUND

On 1 June 2004, all hospitality venues in Norway became smoke-free as a result of amendments to the Tobacco Act. This ensured that employees in the hospitality industry had a smoke-free working environment, a right the vast majority of other employees in Norway have had since 1988.

As part of the evaluation of the overall efforts to prevent tobacco-related diseases from 2003 to 2007, the HEMIL Centre was commissioned by the Directorate for Health and Social Affairs (SHdir) to conduct a national representative one-year panel study among employees in the hospitality industry. The investigation consisted of a baseline survey and two follow-up surveys which were conducted six months and one year after the baseline survey, respectively. The survey was intended to map employees' smoking habits, subjectively experienced air quality at the workplace, health complaints among the employees, employees' job satisfaction and experienced enforcement problems, as well as expectations of and attitudes to the ban on smoking in hospitality venues before and after the legislative amendment. Two previously published reports from the survey (Hetland & Aaro, 2005; Hetland & Aarø, 2005) indicated a series of changes in the above-mentioned areas of focus from the baseline survey to the first follow-up survey. This report is intended to summarise these findings, and to further investigate whether the changes found six months after the introduction of smoke-free hospitality venues also persisted at the final follow-up survey, about one year after the amendments to the Tobacco Act entered into force. The report presents results from the three rounds of data collection as well as descriptions of changes in the following areas of focus:

- 1) Employees' smoking habits
- 2) Expectations of and attitudes to the ban
- 3) Experienced enforcement problems
- 4) Subjectively experienced air quality
- 5) Subjective health complaints



## 2. SUMMARY OF FINDINGS SIX MONTHS AFTER THE INTRODUCTION OF SMOKE-FREE HOSPITALITY VENUES

### 2.1 Employees' smoking habits

Previously published findings from this survey confirm the common perception that employees in the hospitality industry are an occupational group with a relatively high percentage of smokers compared with the general population (Hetland & Aarø, 2005). In the baseline survey conducted in May 2004, no fewer than 53% of the employees reported smoking daily. Figures from Statistics Norway indicate that the comparable proportion of smokers among the general population in the same age cohorts is just 26.3%. One interesting question is whether the introduction of smoke-free hospitality venues has also had an impact on the employees' smoking habits. In support of this hypothesis, the figures from the first follow-up survey indicated that about every 10<sup>th</sup> employee who reported smoking daily at the baseline survey had quit smoking daily within six months after the introduction of smoke-free hospitality venues. This report examines this finding more closely to determine whether the picture was still the same one year after the baseline survey.

### 2.2 Attitudes to and expectations of the introduction of smoke-free hospitality venues

Despite the fact that the introduction of smoke-free hospitality venues was largely driven by the employees' trade unions, a number of articles in the media drew a picture of a certain resistance to the legislative amendment among hospitality industry employees (K. E. Lund, 2006). In an earlier report from the present survey, we found, however, that far more employees in the hospitality industry were positive to the legislative amendment (48.3%) than those who were negative to the amendment (29.6%). The same ratio between the percentages of positive and negative employees was repeated in the follow-up survey six months later, and no change was observed (Hetland & Aarø, 2005).

This is in contrast to surveys performed in other countries that have introduced a total ban on smoking in hospitality venues, where we see an increase in the proportion of employees who are positive to working in a smoke-free working environment. In measurements undertaken before and after the introduction of smoke-free hospitality venues in California, there was an increase from 17% to 51% of the percentage of employees who preferred a smoke-free working

environment (Tang, Cowling, Stevens, & Lloyd, 2004). In a comparable survey from Ireland, it was found that the percentage of hospitality industry employees who supported a total ban on smoking in hospitality venues increased from 43% before the introduction to 67% after (Fong, Hyland, & Borland, 2005). Accordingly, it is reasonable to envisage that, over time, we will see a similar change in Norway when it comes to employees' attitudes to working in a smoke-free environment. Based on this, we expect that more employees will have a positive attitude to the legislative amendment in the present final survey. The survey also measures more specific attitudes and expectations and, in line with lessons learned from Ireland and California, we found an increase in positive attitudes six months after the introduction of the ban, accompanied by a reduction in negative expectations.

### **2.3 Experienced enforcement problems**

One important argument for amending the Tobacco Act was that the former solution, in which at least 50% of the tables and seats in the hospitality venues were to be smoke-free, was not adequately enforced. Inspection efforts associated with regulations were not given sufficiently high priority by the municipalities either (Knoff, 1999). In a previous report from the present survey that dealt with enforcement problems, it was found that a larger percentage of the employees reported that the Act was adequately enforced at their workplace six months after the introduction of the ban. Under the old scheme in which hospitality venues were divided into smoking and non-smoking zones, 78% of employees reported that the regulations were to a “very great extent” or a “great extent” observed at their place of work, while after the introduction of a total ban on smoking in hospitality venues, the comparable figure climbed to 98%. There is little reason to believe this picture has changed significantly six months after the first follow-up survey.

### **2.4 Air quality**

As mentioned above, the main objective of the introduction of smoke-free hospitality venues was to ensure the employees a smoke-free working environment. The earlier figures published from the survey indicate that this target was largely reached six months after the legislative amendment entered into force. The percentage of employees reporting they were troubled by second-hand smoke at work was reduced from 44% to 6% from before to after the introduction of smoke-free hospitality venues. The follow-up survey also showed that other aspects of the air quality at hospitality venues such as odours and dryness had improved. These findings have also

largely been confirmed by studies involving “objective” measurements of air quality in a sample of hospitality venues in Norway (Ellingsen et al., 2006) and Ireland (Mulcahy, Evans, Hammond, Repace, & Byrne, 2005).

## **2.5 Employee health**

Previously published findings from the survey indicated a decrease in employees' reporting of general health complaints (Hetland & Aaro, 2005), as well as more specific complaints related to the respiratory passages (Eagan, Hetland, & Aaro, 2006; Hetland & Aaro, 2005), from before to six months after the introduction of smoke-free hospitality venues. These findings agree well with similar surveys performed among employees in bars and restaurants in California (Eisner, Smith, & Blanc, 1998). It is nonetheless interesting to see whether this trend will continue and whether there will be a further reduction in the level of health complaints in the final follow-up survey that was undertaken one year after the introduction of smoke-free hospitality venues. The final follow-up survey was carried out at the same time of year as the baseline survey, allowing us to exclude to a greater extent that the variations in health complaints are ascribable to variations in the weather or seasonal allergies.



### 3. METHOD

#### 3.1 Design

This survey among hospitality industry employees is a one-year panel investigation with three dates of measurement. The first measurement took place in May 2004, the second in September/October 2004, and the third in May 2005. Data collection (telephone interviews) was conducted by Markeds- og mediainstituttet A/S (MMI), commissioned by the Directorate for Health and Social Affairs and the HEMIL Centre. The data file with data documentation was submitted to the HEMIL Centre for statistical analysis and reporting.

#### 3.2 Sample and procedure

The sample was selected by contacting enterprises in the hospitality industry by phone. Each hospitality venue was asked to supply one or more employees based on a sampling procedure that ensured representativeness. Further, using a standardised questionnaire, a 10-minute telephone interview was conducted with the employee (appendix A).

In the initial round of data collection, 1525 employees were interviewed, consisting of 719 men and 806 women (Table 1). The average age of the sample was 35.1 years. Of the original sample, 894 participated in the first follow-up survey (2nd measurement). This gives an attrition rate of 42.4 % from the first measurement to the second. The second follow-up survey covered 758 members of the original sample, which gives an attrition rate of 51.3% compared with the first measurement. Of the 1525 who took part in the first measurement, 580 (38%) participated in both follow-up surveys.

#### 3.3 Measurement

The interview forms used for the three data collections are shown in appendix A (the baseline survey). This report uses the following categories of questions:

- Employees' smoking habits (2 items) (questions 16 and 17)
- Expectations of and attitudes to the ban (10 items) (questions 28 and 29)
- Compliance with the Tobacco Act (1 item) (question 30)
- Experienced enforcement problems (5 items) (question 31)
- Subjectively experienced air quality (4 items) (question 26)
- General health complaints (8 items) (question 23)

- Respiratory complaints (5 items) (question 24)

### **3.4 Analyses**

Changes in ordinal categorial variables (ranked categories) are analysed using percentages and the Wilcoxon signed ranks test. Changes in total scores are described by arithmetic means and t-tests for correlated groups. To optimise the number of employees in the various comparisons, all those who have responded to the two relevant measurement points in the comparison have been included in the analyses. Consequently, n will vary across the various comparisons.

## 4. RESULTS

### 4.1 Employees' smoking habits

Table 2 illustrates changes in the employees' smoking habits from before to after the introduction of smoke-free hospitality venues. The table shows that there has been a significant change in the employees' smoking habits from before the introduction to six months after, and from before the introduction to one year after the introduction. There is no significant difference between the first (six months) and second follow up (one year). The table also indicates that the percentage of employees who smoke daily decreased by 4.6 percentage points from before the introduction (51.8%) to six months after (47.2%). One year after the introduction, the percentage of employees who smoke daily was 47.4%. Please note here that *n* and thereby the percentages cannot be compared directly across the different pairs of comparisons.

Further, it appears from Table 3 that there has also been a significant reduction in the average number of cigarettes smoked per day from before the introduction of smoke-free hospitality venues to the first follow up, while there was no significant change from the first to the second follow up. While the average consumption of cigarettes among employees who smoke was 14.5 cigarettes per day before the introduction, the average daily consumption was reduced to around 13.2 cigarettes per day one year after the introduction.

Table 4 illustrates changes in the employees' smoking habits at work after the introduction of smoke-free hospitality venues. The table shows that there has been a decline in the percentage who smoke every time they are at work from the baseline survey to both the first (from 80.5% to 72.5%) and the second follow up (from 79.6% to 72.5%). When one compares the first and second follow up, however, there has not been any further significant change in the employees' smoking habits at work. Further, the table shows that there was a very similar increase in the percentage of employees who reported that they smoke occasionally at work during the same periods, while the percentage who did not smoke at work remained almost unchanged.

When we look at the mean number of cigarettes smoked at work, we find that here too there has been a significant change from before the introduction of smoke-free hospitality venues to both the first follow up (six months after) and the second follow up (one year after) (Table 5). Nor was there any significant change from the first to the second follow up. While employees who are smokers smoked an average of 7.8 cigarettes per day before the introduction, the comparable

figure had been reduced to 6.1 cigarettes by the second follow-up survey. This indicates that the average change in daily consumption can in its entirety be ascribed to the employees' smoking fewer cigarettes while at work.

**4.2 Attitudes to and expectations of the introduction of smoke-free hospitality venues**

Table 6 shows changes in the employees' general attitude to the introduction of smoke-free hospitality venues. The table shows that there is not a significant difference in the employees' general attitude before the introduction and at the first follow-up survey, while their attitude a year after was significantly different from the two preceding measurements. Comparing the employees' attitudes from the first to the second follow up, we see that a larger percentage of employees is positive to the introduction at the second follow up (60.1%) than at the first follow up (54.4%). Further, there is a lower percentage who reports a negative attitude at the second follow up (22.5%) than at the first follow up (28.1%), while the percentage of those who are neutral remains unchanged. Looking at the change from before the introduction of smoke-free hospitality venues to one year after, we find the percentage of those with a positive attitude has increased from 48.5% to 59.8%, while those who are negative and neutral declined from 29.0% to 23.3% and from 22.5% to 16.9%, respectively (Figure 1). As can be seen from Figure 1, there has been an increase in the percentage who reported that they are positive from the baseline survey to one year after the introduction. We can also see that of those who became more positive to the introduction during that year, almost equal numbers were neutral or negative before the introduction.

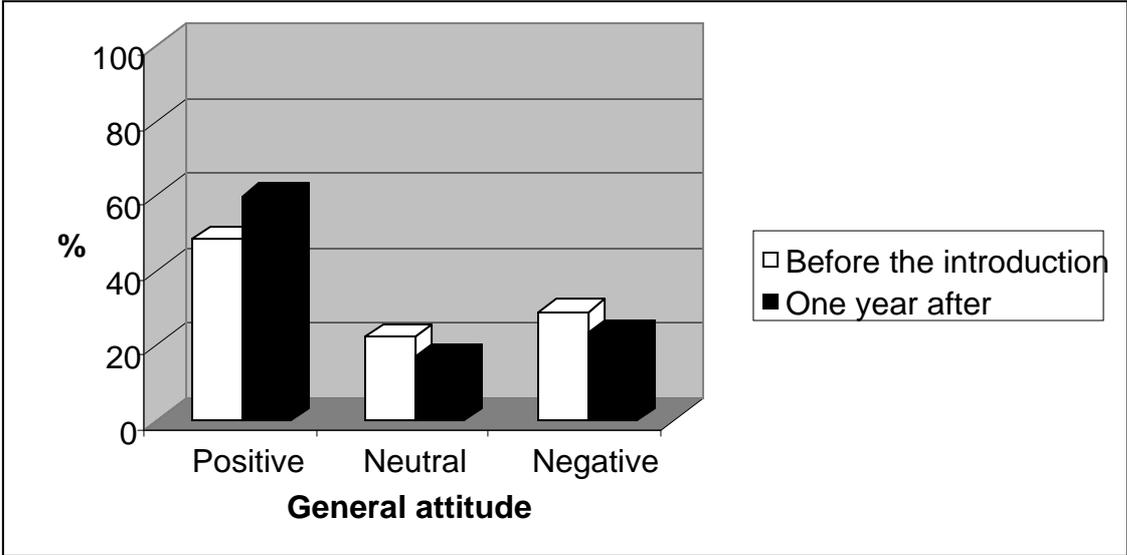


Figure 1. Percentages who are positive, neutral and negative to the introduction of smoke-free hospitality venues before and one year after the introduction.

The survey also contains a series of questions designed to measure more specific attitudes to and expectations of the introduction of smoke-free hospitality venues. We have previously shown that these can be divided into three subcategories: positive attitudes, negative expectations and intended compliance (Hetland & Aarø, 2005). Table 7 shows the average changes in these scores between the different dates of measurement. As illustrated by the table, there was a moderate but significant change in employees' positive attitudes from before the introduction to six months after ( $\Delta\bar{x} = -0.07$ ;  $t = -2.11$ ;  $p < 0.05$ ). One year after, there was clearly a higher level of positive attitudes among the employees, compared with the level before the introduction ( $\Delta\bar{x} = -0.43$ ;  $t = -11.81$ ;  $p < 0.001$ ). Further, there had been a decrease in the level of negative expectations among the employees from before the introduction to six months after ( $\Delta\bar{x} = 0.58$ ;  $t = 15.82$ ;  $p < 0.01$ ), and there had been a further reduction in negative expectations one year after the introduction ( $\Delta\bar{x} = 0.82$ ;  $t = 19.92$ ;  $p < 0.01$ ). Finally, we see that there was an increase in employees' intended compliance with the ban on smoking from before to six months after the ban ( $\Delta\bar{x} = -0.14$ ;  $t = 4.48$ ;  $p < 0.01$ ), and that there has also been a further increase in employees' intentions to comply with the ban on smoking one year after ( $\Delta\bar{x} = -0.27$ ;  $t = 10.27$ ;  $p < 0.01$ ) the introduction of smoke-free hospitality venues.

### **4.3 Compliance and enforcement problems associated with the “Tobacco Act”**

Table 8 shows the employees' opinions about compliance with the “Tobacco Act” before and after the introduction of smoke-free hospitality venues. As illustrated by the table, there has been a pronounced change in experienced compliance from before the introduction to six months after, and this change continued one year after the introduction. When looking at the percentage who reported that they to a very great extent experienced compliance with the Act at their place of work before and one year after the introduction, we find that there has been an increase from 51.4% to 89.8%. The percentage reporting little or no compliance with the Act declined from 22.3% to 1.6% in the same period.

Table 9 indicates changes in experienced enforcement problems before and after the legislative amendment. The table shows that as regards enforcement problems or unpleasant situations with guests, there was a significant change in the complaints about smoking from the first measurement to both follow-up measurements, while there was not any significant difference in

reporting between the two follow-up measurements. Looking at the change from the baseline survey to the follow-up survey conducted a year later, we see that the percentage reporting that they often or occasionally experience enforcement problems or unpleasant situations with guests, and have received complaints about smoking decreased by 13.2, 5.6, and 12.6 percentage points, respectively. The employees were also asked how often smoking took place in prohibited areas. Here, there was a pronounced and significant change from the baseline survey to the follow-up surveys, and there was also a significant change between the two follow-up surveys. From the table we see that the percentage reporting that smoking occurred in prohibited areas decreased by 28.5 percentage points from before the introduction to one year after, but that there has been a slight increase in the percentage reporting that violations occur rarely or more often, i.e. approx. 4 percentage points from the first to the second follow up.

#### **4.4 Air quality**

Table 10 shows the change in the subjectively experienced air quality from before to after the introduction of smoke-free hospitality venues. The survey asks about the extent to which the employees experience that they are troubled by second-hand tobacco smoke, stale/poor quality air, dry air and unpleasant odours at their place of work. The table shows that there was a significant improvement in subjectively experienced air quality across all these factors from the baseline survey to both follow-up surveys, while there was no significant difference from the first to the second follow-up survey. The main purpose of the introduction of smoke-free hospitality venues was to ensure employees a smoke-free working environment, and the table shows that there has been a reduction of almost 40 percentage points in the proportion who report that they are troubled by second-hand tobacco smoke from before to one year after the introduction of smoke-free hospitality venues. When we examine poor air quality, dry air and unpleasant odours, during the same period, there has been a decline of 17.2, 10.7 and 18.2 percentage points, respectively.

#### **4.5 General health complaints**

Table 11 illustrates the change in general health complaints from before to after the introduction of smoke-free hospitality venues. As the table indicates, there has been a significant reduction in reporting from before the introduction to six months after for all health complaints. Further, we see that with only one exception (hoarse, dry throat), there was not any significant change from the first to the second follow up. Comparing the baseline survey with the follow-up survey

conducted one year after the introduction of smoke-free hospitality venues, we see that for most complaints (heavy-headed feeling, headache, concentration problems, irritated eyes, and hoarseness), the employees reported that their complaints are less severe one year after than was the case before the introduction. For fatigue, dizziness and stuffy or runny noses, there was, however, no significant difference from before to one year after the introduction.

Table 12 illustrates the average change in the level of health complaints among the employees from before to one year after the introduction of smoke-free hospitality venues. The table shows that there was a moderate, but significant, reduction in the level of health complaints from before to six months after the ban ( $\Delta\bar{x} = 0.20$ ;  $t = 8.00$ ;  $p < 0.01$ ) and further, that one year after the introduction of smoke-free hospitality venues, there was still a lower level of health complaints among the employees compared with before the introduction ( $\Delta\bar{x} = 0.14$ ;  $t = 5.65$ ;  $p < 0.01$ ).

#### **4.6 Respiratory health complaints**

Table 13 shows the change in complaints associated with respiratory passages from before to after the introduction of smoke-free hospitality venues. As the table indicates, there has been a significant reduction in the reporting of all respiratory complaints when we compare the measurements made before the introduction with those taken six months and one year after the introduction. The exception is the measurement of expectorant in connection with coughing or clearing one's throat one year after the introduction, where the significant decline after six months was not observed after one year. We did not see any significant change from the first to the second follow up for any of the measurements.

Table 12 illustrates the average change in the level of respiratory health complaints among the employees from before to one year after the introduction of smoke-free hospitality venues. The table reflects the same pattern as for the more general health complaints; a moderate reduction in the level of complaints from before to six months after the ban ( $\Delta\bar{x} = 0.09$ ;  $t = 3.20$ ;  $p < 0.01$ ). Further, we see that one year after the introduction of smoke-free hospitality venues, there was a lower level of complaints associated with respiratory passages among the employees compared with before the introduction ( $\Delta\bar{x} = 0.08$ ;  $t = 2.78$ ;  $p < 0.01$ ).



## 5. DISCUSSION

### 5.1 Employees' own smoking habits

One important question before the introduction of smoke-free hospitality venues was whether the ban on smoking would also affect the employees' own smoking habits. Surveys have shown that after the ban on smoking was introduced in other work arenas, there was an increase in the number of employees who tried to quit smoking and total cigarette consumption among the employees at these places of work was reduced (Bauer, Hyland, Li, Steger, & Cummings, 2005; Chapman et al., 1999). In line with this, the present survey revealed a significant reduction of approx. 4.5 percentage points in the percentage of daily smokers among the hospitality industry employees at both follow-up surveys compared with the baseline survey carried out the month before the introduction of smoke-free hospitality venues in Norway. A closer look at daily tobacco consumption shows a reduction of almost one and one half cigarettes per day at both follow-up surveys, indicating that this reduction is largely associated with the employees smoking less when they are at work.

Despite the above-mentioned reduction in the employees' smoking habits and their consumption of cigarettes, after the total ban on smoking in hospitality venues entered into force, there is still a very high proportion of the hospitality industry employees who smoke on a daily basis compared with the general adult population. Almost one year after the introduction of smoke-free hospitality venues, 47.4% of them report smoking daily, while the comparable figure in the general population is 26.3%. The fact that we find no change from the first to the second follow-up measurement suggests that the reduction in the percentage who smoke daily appears to be stable. On the other hand, the figures also indicate that it is highly unlikely that one will soon find any further reduction in the percentage of those who smoke on a daily basis among the hospitality industry employees beyond the reduction found by the first follow-up survey, and that hospitality industry employees may therefore be an important target group for future tobacco prevention interventions.

### 5.2 Attitudes to and expectations of the introduction of smoke-free hospitality venues

In contrast to experiences from other countries that have introduced smoke-free hospitality venues, we found no changes in the employees' general attitude to the introduction of smoke-free hospitality venues at the first follow-up survey. Accordingly, it is very interesting that the percentage who are positive to hospitality venues being smoke-free in the second follow-up

survey shows an increase of more than 10 percentage points compared with the baseline survey (from 48.5% to 59.8%). In line with this, we also find a higher level of positive attitudes and a higher degree of intended compliance with the Act among the employees at the second follow-up survey than at the first follow-up survey. At the same time, there was a clear reduction in the level of negative expectations associated with the legislative amendment in the same period. This indicates that the expected change in attitude has come over time. Such a change in attitude is also commensurate with changes observed in the public opinion as a result of other legislative amendments such as the mandatory use of seat belts and the introduction of lower alcohol limit for drivers. (J. Lund & Aarø, 2004).

### **5.3 Compliance and enforcement problems**

The results of the present survey indicate that compliance is better with a total ban on smoking in hospitality venues than it was with the former scheme with smoking and non-smoking zones. It is conceivable that this means it is easier for the employees to enforce a total ban than the regime of separate zones. Another explanation may be that inspection work associated with the regulations is simpler with the new scheme. In spite of this, we still find a very modest, but significant, increase in the percentage of employees who report that smoking has taken place where it is prohibited from the first to the second follow-up survey. This bears witness to the fact that even with a total ban, it is important to spend resources on inspection efforts to ensure compliance with smoking regulations at hospitality venues.

### **5.4 Air quality**

The main purpose of the introduction of smoke-free hospitality venues was to ensure the employees a smoke-free working environment, and the results from the present survey indicate that this goal has been achieved. Further, it has been ascertained that the overall air quality has improved, and that the employees have been less bothered by stale/dry air and bad odours in the workplace since the introduction of smoke-free hospitality venues.

### **5.5 Employees' health**

One general objective of amending Norway's tobacco legislation was to reduce health problems associated with smoking. For employees in the hospitality industry, it would appear that such an effect has been achieved. The change seems mainly to have taken place in the first six months

after the introduction of the legislative amendment. This seems reasonable inasmuch as the health complaints measured are probably directly affected by working in a smoke-filled environment. Accordingly, the cessation of exposure to smoke should have had quite an immediate impact, and not be a gradual change beyond the first six months. For some of the health complaints, the change after six months appears to have disappeared by the end of a whole year. This may indicate that some of the change in the health complaints is a result of season variations rather than a direct result of the cessation of exposure to smoking. The pre-ban and follow-up measurements one year after were carried out in the month of May, when some people are troubled by pollen allergies, while the 6-month follow up was made in September/October when those who are allergic to pollen are less bothered by problems. If such allergies are common among hospitality industry employees, it is possible that the decline in health complaints such as tiredness, dizziness and perhaps especially stuffy or runny noses, may be a direct result of seasonal variations rather than less exposure to smoke. Examining the health complaints as a whole, however, there is a clear decline among hospitality personnel in the first six months after the legislative amendment, and there was no significant change during the next six months. The level of complaints (respiratory complaints as well as general health complaints) remained lower than at baseline also at the second follow-up data collection (after one year). This indicates that the legislative amendment had a favourable impact on the employees' health, an effect which took place soon after the amendment was implemented.

## **5.6 Conclusion**

The main purpose of this report was to summarise various changes which took place among employees after the introduction of smoke-free hospitality venues in Norway in 2004. Specifically, we wanted to examine changes in employees' own smoking habits, expectations of and attitudes to the ban, problems related to enforcing the ban, subjectively experienced air quality and employees' own health complaints. Since earlier reports were limited to changes during the first six months after the introduction of the legislative amendment, the purpose of this report was to examine whether further changes had taken place by one year after the amendment of the legislation. One general finding is that most of the changes that took place for the employees in the hospitality industry, took place within six months after the change was introduced, and that these changes still persisted one year after the introduction. One exception to this is employees' attitudes to the introduction of the ban which, to a greater extent, became more favourable to the change some time after their introduction. The report also indicates that the

legislative amendment has had a modest effect on hospitality personnel's own smoking habits. Inasmuch as this is a relatively large occupational group with a higher prevalence of smokers than the general public, it is possible that special measures should be targetted at this group in order to further reduce smoking as a medical and social problem.

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## TABLES

Table 1. Sample by gender and age groups.

	1 <sup>st</sup> measurement		2 <sup>nd</sup> measurement		3 <sup>rd</sup> measurement	
	n	%	n	%	n	%
<b>Gender</b>						
Man	719	47.1	405	47.8	372	49.1
Woman	806	52.9	442	52.2	386	50.9
Total	1525	100.0	847	100.0	758	100.0
<b>Age groups</b>						
Ages 15-24	321	21.0	167	19.7	130	17.2
Ages 25-44	881	57.8	501	59.1	447	59.0
Ages 45-70	323	21.2	179	21.1	181	23.8
Total	1525	100.0	847	100.0	758	100.0

Table 2 a, b and c. Changes in smoking habits from before to after the introduction of smoke-free hospitality venues. Wilcoxon Signed Rank test.

	Daily	Occasionally	Does not smoke	Total	Total
	%	%	%	%	n
Before the introduction	51.8	6.8	41.4	100	879
Six months after	47.2	9.1	43.7	100	879
Z= - 3.789; p < 0.01					
	Daily	Occasionally	Does not smoke	Total	Total
	%	%	%	%	n
Six months after	46.8	8.1	45.1	100	605
One year after	47.3	8.6	44.1	100	605
Z= -.480; n.s.					
	Daily	Occasionally	Does not smoke	Total	Total
	%	%	%	%	n
Before the introduction	50.9	7.1	42.0	100	758
One year after	47.4	8.8	43.8	100	758
Z= -2.794; p < 0.01					

Table 3. Number of cigarettes (both ready-made and roll-your-own) per day before and after the introduction of smoke-free hospitality venues. T-test.

	mean	sd	n
Before the introduction	14.78	8.14	463
Six months after	13.29	8.13	463
$\Delta\bar{x} = 1.50; t = 6.06; p < 0.01$			
Six months after	12.96	7.81	306
One year after	13.30	8.24	306
$\Delta\bar{x} = - 0.34; t = - 1.01; n.s.$			
Before the introduction	14.51	8.23	393
One year after	13.15	8.26	393
$\Delta\bar{x} = 1.36; t = 4.36; p < 0.01$			

Table 4. a, b, and c. Changes in smoking habits at work from before to after the introduction of smoke-free hospitality venues. Wilcoxon Signed Rank test.

	Every time at work %	Occasionally %	Do not smoke at work %	Total %	Total n
Before the introduction	80.5	13.7	5.8	100	466
Six months after	72.5	23.0	4.5	100	466
$Z = -2.454; p < 0.01$					

	Every time at work %	Occasionally %	Do not smoke at work %	Total %	Total n
Six months after	70.3	23.9	5.9	100	306
One year after	74.5	18.3	7.2	100	306
$Z = -1.007; n.s.$					

	Every time at work %	Occasionally %	Do not smoke at work %	Total %	Total n
Before the introduction	79.6	14.4	6.0	100	397
One year after	72.5	21.2	6.3	100	397
$Z = -2.237; p < 0.05$					

Table 5. Number of cigarettes (both ready-made cigarettes and roll-your-own) at work before and after the introduction of smoke-free hospitality venues. T-test.

	Mean	sd	n
Before the introduction	7.76	5.26	414
Six months after	6.09	4.90	414
$\Delta\bar{x} = 1.67; t = 8.18; p < 0.01$			
Six months after	5.97	4.56	272
One year after	6.14	5.00	272
$\Delta\bar{x} = -.165; t = -.63; n.s.$			
Before the introduction	7.80	5.33	340
One year after	6.11	4.96	340
$\Delta\bar{x} = 1.68; t = 6.40; p < 0.01$			

Table 6. a, b, and c. Change in the general attitude to smoke-free hospitality venues before compared with after the introduction. Wilcoxon Signed Rank test.

	Positive	Neutral	Negative	Total	Total
	%	%	%	%	n
Before the introduction	50.3	21.7	28.0	100	875
Six months after	53.0	18.3	28.7	100	875
Z= -.854; n.s.					
	Positive	Neutral	Negative	Total	Total
	%	%	%	%	n
Six months after	54.4	17.5	28.1	100	601
One year after	60.1	17.5	22.5	100	601
Z= -3.745; p < 0.01					
	Positive	Neutral	Negative	Total	Total
	%	%	%	%	n
Before the introduction	48.5	22.5	29.0	100	756
One year after	59.8	16.9	23.3	100	756
Z= - 5.251; p < 0.01					

Table 7. a, b, and c. Average change in positive attitudes, negative expectations and intended compliance from before to after the introduction of smoke-free hospitality venues. T-test.

Positive attitudes

	Mean	sd	n
Before the introduction	3.62	1.14	863
Six months after	3.69	1.17	863

$$\Delta\bar{x} = -.07; t = -2.11; p < 0.05$$

Six months after	3.70	1.15	597
One year after	4.02	1.10	597

$$\Delta\bar{x} = -.31; t = -8.51; p < 0.01$$

Before the introduction	3.59	1.15	745
One year after	4.01	1.10	745

$$\Delta\bar{x} = -.43; t = -11.81; p < 0.01$$

Negative expectations

	Mean	sd	n
Before the introduction	2.59	1.09	860
Six months after	2.01	0.96	860

$$\Delta\bar{x} = .58; t = 15.82; p < 0.01$$

Six months after	2.03	0.96	585
One year after	1.79	0.92	585

$$\Delta\bar{x} = .24; t = 5.89; p < 0.01$$

Before the introduction	2.63	1.12	736
One year after	1.81	0.93	736

$$\Delta\bar{x} = .82; t = 19.92; p < 0.01$$

Intended compliance

	Mean	sd	n
Before the introduction	4.58	0.64	640
Six months after	4.72	0.52	640

$$\Delta\bar{x} = -.14; t = -4.48; p < 0.01$$

Six months after	4.73	0.52	570
One year after	4.85	0.43	570

$$\Delta\bar{x} = -.12; t = -5.16; p < 0.01$$

Before the introduction	4.59	0.65	748
One year after	4.86	0.42	748

$$\Delta\bar{x} = -.27; t = -10.27; p < 0.01$$

Table 8. a, b, and c. Changes in compliance with the Tobacco Act from before compared with after the introduction of smoke-free hospitality venues. Wilcoxon Signed Rank test.

	To a very great extent	To a great extent	To a small extent	Not at all	Total	Total
	%	%	%	%	%	n
Before the introduction	50.8	27.0	15.1	7.1	100	868
Six months after	90.1	7.7	2.0	0.2	100	868
$Z = -15.849; p < 0.01$						
	To a very great extent	To a great extent	To a small extent	Not at all	Total	Total
	%	%	%	%	%	n
Six months after	91.9	6.6	1.3	0.2	100	602
One year after	91.4	7.0	1.2	0.5	100	602
$Z = - .428; n.s.$						
	To a very great extent	To a great extent	To a small extent	Not at all	Total	Total
	%	%	%	%	%	n
Before the introduction	51.4	26.4	15.7	6.6	100	747
One year after	89.8	8.6	1.1	0.5	100	747
$Z = -14.466; p < 0.01$						

Table 9. a, b, and c. Changes in experienced enforcement problems from before to after the introduction of smoke-free hospitality venues. Wilcoxon Signed Rank test.

Enforcement problems

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Before the introduction	8.6	13.1	32.2	46.1	100	876
Six months after	3.3	5.8	27.3	63.6	100	876

Z = - 9.093; p < 0.01

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Six months after	3.3	5.6	27.9	63.1	100	605
One year after	2.1	5.6	29.8	62.5	100	605

Z = - .527; n.s.

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Before the introduction	9.0	12.0	34.4	44.6	100	756
One year after	2.5	5.3	28.3	63.9	100	756

Z = - 9.548; p < 0.01

Smoking where it is prohibited

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Before the introduction	14.6	13.7	32.0	39.7	100	875
Six months after	1.1	3.7	26.5	68.7	100	875

Z = - 15.783; p < 0.01

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Six months after	1.0	3.1	25.3	70.6	100	605
One year after	1.5	4.0	27.8	66.8	100	605

Z = - 2.200; p < 0.05

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Before the introduction	15.9	13.9	32.8	37.4	100	756
One year after	1.5	3.7	39.0	65.9	100	756

Z = - 14.885; p < 0.01

### Unpleasant situations with guests

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Before the introduction	3.1	7.4	29.6	59.9	100	877
Six months after	2.1	3.2	20.4	74.3	100	877

Z = - 6.837; p < 0.01

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	n
Six months after	2.1	3.3	18.7	75.9	100	605
One year after	1.7	4.0	23.1	71.2	100	605

Z = - 1.770; n.s.

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	N
Before the introduction	4.1	7.7	27.6	60.6	100	756
One year after	1.6	4.6	22.5	71.3	100	756

Z = - 5.519; p < 0.01

### Complaints received about smoking

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	N
Before the introduction	4.2	15.7	43.5	36.6	100	878
Six months after	4.3	4.7	14.0	77.0	100	878

Z = - 12.634; p < 0.01

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	N
Six months after	4.6	4.8	13.1	77.5	100	604
One year after	3.3	4.0	17.9	74.8	100	604

Z = - 249; n.s.

	Often	Occasionally	Very rarely	Not at all	Total	Total
	%	%	%	%	%	N
Before the introduction	4.5	16.1	43.4	36.0	100	756
One year after	3.8	4.2	17.7	74.2	100	756

Z = - 11.747; p < 0.01

Table 10. a, b, and c. Changes in experienced air quality from before to after the introduction of smoke-free hospitality venues. Wilcoxon Signed Rank test.

Stale, poor quality air					
	Yes, often	Yes, sometimes	Rarely or never	Total	Total
	%	%	%	%	n
Before the introduction	14.9	24.0	61.0	100	878
Six months after	6.5	12.5	81.0	100	878
Z= - 9.599; p < 0.01					
	Yes, often	Yes, sometimes	Rarely or never	Total	Total
	%	%	%	%	n
Six months after	6.3	13.1	80.7	100	605
One year after	6.8	14.2	79.0	100	605
Z= - .961 n.s.					
	Yes, often	Yes, sometimes	Rarely or never	Total	Total
	%	%	%	%	n
Before the introduction	14.8	24.7	60.4	100	756
One year after	8.2	14.2	77.6	100	756
Z= - 7.641; p < 0.01					
Dry air					
	Yes, often	Yes, sometimes	Rarely or never	Total	Total
	%	%	%	%	n
Before the introduction	18.6	20.5	60.8	100	876
Six months after	9.1	16.8	74.1	100	876
Z= - 7.971; p < 0.01					
	Yes, often	Yes, sometimes	Rarely or never	Total	Total
	%	%	%	%	n
Six months after	10.4	17.4	72.2	100	604
One year after	10.4	18.0	71.5	100	604
Z= - .277; n.s.					
	Yes, often	Yes, sometimes	Rarely or never	Total	Total
	%	%	%	%	n
Before the introduction	19.8	20.8	59.4	100	753
One year after	12.2	17.7	70.1	100	753
Z= - 5.841; p < 0.01					

### Unpleasant odours

	Yes, often %	Yes, sometimes %	Rarely or never %	Total %	Total n
Before the introduction	15.4	21.8	62.8	100	879
Six months after	6.7	11.9	81.3	100	879

Z= - 8.815; p < 0.01

	Yes, often %	Yes, sometimes %	Rarely or never %	Total %	Total n
Six months after	6.1	11.9	82.0	100	605
One year after	7.1	10.9	82.0	100	605

Z= - .505; n.s.

	Yes, often %	Yes, sometimes %	Rarely or never %	Total %	Total n
Before the introduction	14.9	21.4	63.7	100	757
One year after	6.6	11.5	81.9	100	757

Z= - 7.896; p < 0.01

### Second-hand tobacco smoke

	Yes, often %	Yes, sometimes %	Rarely or never %	Total %	Total n
Before the introduction	22.6	22.4	54.9	100	879
Six months after	1.7	4.8	93.5	100	879

Z= - 16.130; p < 0.01

	Yes, often %	Yes, sometimes %	Rarely or never %	Total %	Total n
Six months after	1.7	4.5	93.9	100	605
One year after	1.3	3.8	94.9	100	605

Z= - .805; n.s.

	Yes, often %	Yes, sometimes %	Rarely or never %	Total %	Total n
Before the introduction	21.9	22.9	55.2	100	757
One year after	2.2	3.3	94.5	100	757

Z= - 15.258; p < 0.01

Table 11. a, b, and c. Changes in general health complaints from before to after the introduction of smoke-free hospitality venues. Wilcoxon Signed Rank test.

Tiredness

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	7.3	11.9	17.8	25.3	37.6	100	874
Six months after	8.8	8.2	13.7	27.5	41.8	100	874

Z = - 2.601; p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	9.4	7.9	14.6	28.0	40.1	100	604
One year after	9.1	10.6	13.2	27.2	39.9	100	604

Z = - .545; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	8.8	11.7	16.4	25.4	37.8	100	752
One year after	10.0	12.2	13.3	23.9	40.6	100	752

Z = - .233; n.s.

Heavy-headed feeling

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	3.7	7.8	15.2	28.2	45.1	100	873
Six months after	2.1	4.9	8.8	30.7	53.5	100	873

Z = - 6.424; p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	1.8	4.1	10.0	32.2	51.9	100	603
One year after	2.7	5.0	7.6	30.0	54.7	100	603

Z = - .165; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	3.7	8.1	14.1	28.7	45.4	100	753
One year after	3.6	5.4	7.3	28.3	55.4	100	753
$Z = - 5.145; p < 0.01$							

### Headache

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	N
Before the introduction	2.5	6.0	11.1	31.3	49.1	100	873
Six months after	2.1	3.2	7.6	32.3	54.9	100	873
$Z = - 4.717; p < 0.01$							

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	N
Six months after	2.3	3.6	6.5	34.2	53.4	100	603
One year after	2.8	3.6	6.0	33.0	54.6	100	603
$Z = - .113; n.s.$							

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	3.1	5.6	10.7	32.8	47.9	100	751
One year after	2.9	4.5	5.7	32.2	54.6	100	751
$Z = - 3.899; p < 0.01$							

### Dizziness

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	1.3	1.9	3.2	18.2	75.4	100	874
Six months after	0.6	0.8	2.1	16.5	80.1	100	874
$Z = - 3.733; p < 0.01$							

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	0.3	0.7	2.3	17.1	79.6	100	603
One year after	1.2	1.7	1.2	16.6	79.4	100	603
$Z = - .790; n.s.$							

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	0.8	1.9	3.2	19.0	75.2	100	753
One year after	1.1	2.8	1.7	15.8	78.6	100	753

Z = - .936; n.s.

### Concentration problems

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	N
Before the introduction	2.2	4.1	7.5	26.3	59.9	100	875
Six months after	1.5	2.5	4.3	23.3	68.3	100	875

Z = - 5.160; p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	N
Six months after	1.3	2.3	4.3	23.9	68.1	100	602
One year after	1.7	3.7	4.3	19.6	70.8	100	602

Z = - .050; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	2.0	3.7	8.1	26.5	59.7	100	752
One year after	1.6	4.4	4.1	18.5	71.4	100	752

Z = - 4.549; p < 0.01

### Itching, burning or irritation around the eyes

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	4.5	6.2	9.1	23.2	57.0	100	875
Six months after	1.1	2.4	3.2	19.9	73.4	100	875

Z = - 9.795, p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	1.2	2.7	3.3	21.1	71.8	100	602
One year after	4.0	3.3	3.8	17.8	71.1	100	602

Z = - 1.952; p < 0.05

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	4.4	5.2	9.3	23.2	57.9	100	753
One year after	5.0	3.1	4.6	15.0	72.2	100	753

Z = - 4.644; p < 0.01

#### Irritated or runny nose

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	4.0	3.8	7.7	24.1	60.4	100	874
Six months after	2.5	2.3	5.3	26.1	63.8	100	874

Z = - 3.546, p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	1.2	2.1	5.8	27.9	63.0	100	605
One year after	3.5	4.3	3.8	22.6	65.8	100	605

Z = - 1.139; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	3.3	4.2	7.8	24.9	59.7	100	754
One year after	4.2	4.9	3.8	21.4	65.6	100	754

Z = - 1.316; n.s.

#### Hoarseness, dry throat

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	7.2	7.9	12.1	28.5	44.3	100	874
Six months after	3.5	4.1	6.3	28.0	58.0	100	874

Z = - 8.490; p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	2.6	4.1	6.3	30.0	57.0	100	604
One year after	3.8	5.1	7.9	25.7	57.5	100	604

Z = - 1.153; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total %	Total n
Before the introduction	6.9	8.8	11.7	27.4	45.2	100	752
One year after	4.1	5.5	8.2	24.7	57.4	100	752
$Z = -6.112; p < 0.01$							

Table 12. a, b, and c. Average change in general health problems from before to after the introduction of smoke-free hospitality venues. T-test.

	Mean	Sd	n
Before the introduction	1.82	0.71	636
Six months after	1.62	0.58	636
$\Delta\bar{x} = .20; t = 8.00; p < 0.01$			
Six months after	1.60	0.56	572
One year after	1.64	0.65	572
$\Delta\bar{x} = -.04; t = -1.42; n.s.$			
Before the introduction	1.81	0.71	745
One year after	1.67	0.68	745
$\Delta\bar{x} = .14; t = 5.65; p < 0.01$			

Table 13. a, b, and c. Changes in problems associated with respiratory passages from before to after the introduction of smoke-free hospitality venues. Wilcoxon Signed Rank test.

Coughing in the morning

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	5.9	6.1	7.2	20.2	60.6	100	639
Six months after	5.3	4.1	5.9	19.6	65.1	100	639

Z = - 2.508; p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	4.6	4.0	6.0	19.2	66.2	100	604
One year after	6.1	4.8	5.3	18.7	65.1	100	604

Z = - 1.085; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	7.0	6.6	6.7	19.1	60.7	100	745
One year after	7.0	5.0	5.0	17.7	65.4	100	745

Z = - 2.648; p < 0.01

Coughing during the day

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	9.0	5.2	9.0	30.4	46.4	100	866
Six months after	6.2	5.3	9.4	27.5	51.6	100	866

Z = - 3.004; p < 0.01

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	4.8	4.3	9.4	30.4	51.1	100	605
One year after	7.6	5.5	4.3	25.8	56.9	100	605

Z = - .331; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	9.9	5.6	8.4	25.8	50.2	100	747
One year after	8.4	5.9	4.4	24.5	56.8	100	747
Z = - 2.731; p < 0.01							

### Expectorant when you cough

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	N
Before the introduction	4.2	3.0	8.1	19.8	64.9	100	863
Six months after	3.1	3.5	5.2	17.5	70.7	100	863
Z = - 3.441; p < 0.01							

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	2.1	3.1	6.0	19.3	69.4	100	605
One year after	3.8	4.3	4.1	18.0	69.8	100	605
Z = - .885; n.s.							

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	3.8	3.4	7.3	19.0	66.7	100	744
One year after	4.2	4.7	3.5	16.7	71.0	100	744
Z = - 1.109; n.s.							

### Shortness of breath

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	4.9	4.9	9.5	21.4	59.4	100	864
Six months after	3.9	2.8	6.3	20.8	66.2	100	864
Z = - 4.764; p < 0.01							

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Six months after	3.8	2.0	6.3	22.8	65.1	100	605
One year after	5.1	3.6	5.5	18.7	67.1	100	605

Z = - .789; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	5.4	5.0	8.9	20.0	60.8	100	744
One year after	6.6	4.0	4.8	17.6	66.9	100	744

Z = - 2.095; p < 0.01

#### Wheezing in the chest

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	N
Before the introduction	2.2	1.8	5.0	17.1	73.9	100	865
Six months after	2.2	1.5	4.0	13.5	78.7	100	865

Z = - 2.427; p < 0.05

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	N
Six months after	1.7	1.5	4.0	15.2	77.7	100	605
One year after	1.7	2.5	2.6	13.2	80.0	100	605

Z = - .525; n.s.

	Almost every day	More than once a week	Almost every week	Less frequently	Never	Total	Total
	%	%	%	%	%	%	n
Before the introduction	1.7	2.7	4.2	15.7	75.7	100	745
One year after	1.6	2.8	2.1	12.2	81.2	100	745

Z = - 2.442; p < 0.05

Table 14. a, b, and c. Average changes in problems associated with respiratory passages from before to after the introduction of smoke-free hospitality venues. T-test.

	Mean	Sd	n
Before the introduction	1.70	0.81	636
Six months after	1.61	0.78	636
$\Delta\bar{x} = .09; t = 3.20; p < 0.01$			
Six months after	1.57	0.73	578
One year after	1.60	0.86	578
$\Delta\bar{x} = -.03; t = -.86; n.s.$			
Before the introduction	1.70	0.84	740
One year after	1.62	0.86	740
$\Delta\bar{x} = .08; t = 2.78; p < 0.01$			



## APPENDIX A: Questionnaire for the baseline survey<sup>2</sup>

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<sup>2</sup> Some expressions used in the interview form are difficult to translate into English. Additional explanation or the Norwegian wording is therefore sometimes provided in square brackets.

q3: How long have you worked in the hospitality industry?

Number of years: \_\_\_\_\_

Number of months: \_\_\_\_\_

q4: How long do you plan to continue working in this industry?

Only a short time 1

A few months 2

About one year 3

More than a year 4

q5: How many hours do you usually work in one week?

Number of hours: \_\_\_\_\_

.....

q10: Do you usually work during daytime, in evenings or does your work schedule vary?

Daytime 1

Evenings (nights) 2

Varies 3

q11: In what kind of establishment do you work?

Restaurant 1

Cafeteria/café/roadside restaurant 2

Coffee bar 3

Pub/bar 4

Night club/discotheque 5

q12: Is the establishment where you work part of a hotel or place where you can stay overnight?

Yes 1

No 2

q13: Approximately how many employees are there in the establishment [bar, restaurant] where you are working?

Number of employees: \_\_\_\_\_

q14: Approximately how many seats for guests [customers] are available in the premises where you work?

Number of chairs: \_\_\_\_\_

q15: Approximately how large proportion of your guests do you believe are smokers?

Please indicate percentage: \_\_\_\_\_

q16: How would you describe your present smoking habits? Do you smoke daily, sometimes, or do you not smoke?

Daily	1
Sometimes	2
Don't smoke	3

q17: How many cigarettes do you usually smoke per day?  
Number of cigarettes (manufactured as well as hand rolled):

\_\_\_\_\_

q18: Do you have any specific [konkrete] plans to stop smoking? If so: Do you plan to stop within 30 days, within 6 months, or further into the future?

Stop within 30 days	1
Stop within 6 months	2
Stop further into the future	3
No specific plans to stop smoking	4

q19: How would you describe your smoking habits at work? Do you smoke daily at work, sometimes, or don't you smoke at work?

Every day at work	1
Sometimes	2
Don't smoke at work	3

q20: How many cigarettes do you usually smoke during work hours in one day?  
Number of cigarettes (manufactured as well as hand rolled):

\_\_\_\_\_

q21: To what extent do you spend time at work in rooms where other people are smoking?  
Is it ..

To a large extent	1
To some extent	2
To a small extent	3
Not at all	4

q22: To what extent do you spend time in rooms where other people smoke during leisure?  
Is it ...

To a large extent	1
To some extent	2
To a small extent	3
Not at all	4

q23: During the last 2 months: How often has it happened that you have had the following symptoms/complaints?

	About every day	> Once per week	Weekly	More seldom	Never
Tiredness	1	2	3	4	5
Heavy-headedness [tung i hodet]	1	2	3	4	5
Headache	1	2	3	4	5
Dizziness	1	2	3	4	5
Difficulties concentrating	1	2	3	4	5
Itching, stinging pain, irritated eyes	1	2	3	4	5
Irritated or running nose	1	2	3	4	5
Hoarseness, dry throat	1	2	3	4	5

q24: We will now ask some more questions related to symptoms and complaints related to the respiratory passage [luftveiene]

	About every day	> Once per week	Weekly	More seldom	Never
Coughing or having to clear your throat in the morning	1	2	3	4	5
Coughing during the day	1	2	3	4	5
Phlegm when coughing	1	2	3	4	5
Breathlessness	1	2	3	4	5
Wheezing sound in your chest	1	2	3	4	5

q25: Have you during the last two months had a cold or influenza?

Yes	1
No	2
Don't know	3

q26: Have you during the last 2 months been bothered from one or more of the following conditions in your workplace?

	Yes, often	Yes, sometimes	Seldom or never
Stuffy air [innestengt eller dårlig luft]	1	2	3
Dry air	1	2	3
Unpleasant smell	1	2	3
Others' tobacco smoke	1	2	3

q27: Now there are some statements related to your job:  
How much do you agree or disagree with the following?

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I feel fairly satisfied with my present job	1	2	3	4	5
Most days I am enthusiastic about my work	1	2	3	4	5
Each day at work seems like it will never end	1	2	3	4	5
I feel real enjoyment in my work	1	2	3	4	5
I consider my job to be rather unpleasant	1	2	3	4	5

q28: What is your opinion regarding the decision to make bars and restaurants smoke free from June 1<sup>st</sup>? Are you mainly positive, negative or neutral?

Positive	1
Negative	2
Neutral	3

q29: Below there are some statements regarding the upcoming ban on smoking in bars and restaurants:  
How much do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
I am on mainly positive to the ban on smoking	1	2	3	4	5
I fear for my job as a result of the upcoming ban on smoking	1	2	3	4	5
In my opinion the ban on smoking is an acceptable way to reduce passive smoking	1	2	3	4	5

(p. 29 continued)

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
To ask guests who want to light a cigarette not to smoke is unpleasant	1	2	3	4	5
I am going to ignore smoking on our premises [i våre lokaler]	1	2	3	4	5
I believe that our working conditions will improve as a consequence of the ban	1	2	3	4	5
I believe that many guests will refuse to comply with the ban, even after being reprimanded [etter tilsnakk]	1	2	3	4	5
The leadership and the employees will do their best to comply with the purpose of the legislation	1	2	3	4	5
The purpose of the change of the legislation is to improve the work environment of the employees	1	2	3	4	5

q30: According to the present regulations, at least 50% of tables and chairs in bars and restaurants have to be smoke-free. To what extent is this complied with in your workplace?

To a very large extent	1
To a large extent	2
To a small extent	3
Not at all	4
I don't know	5

q31: Here are some more questions about the enforcement of the present legislation.

	Often	Sometimes	Once in a while	Not at all
How often do you experience problems with enforcement of the present smoking legislation?	1	2	3	4
How often does it happen that there is smoking in smoke-free zones in your workplace?	1	2	3	4
How often have you experienced unpleasant situations with guests who refuse to comply with the regulations on smoking?	1	2	3	4
How often have you received complaints from guests regarding others' smoking?	1	2	3	4

q32: Have you, at your workplace” any specific [konkrete] plans to make conditions more convenient after the introduction of the total ban for those who want to smoke a cigarette?

Yes	1
No	2
I don't know	3

q33: What kind of solutions have you considered for those who want to smoke a cigarette?

Heating lamps [varmelamper]	1
Tents [teltløsninger]	1
Put up awnings [markiser]	1
Put up sunshades [parasoller]	1
Lend umbrellas	1
Let them smoke in buses	1
Establish membership clubs	1

q34: Sex

Man	1
Woman	2

q35: What is your age?

Write number of years \_\_\_\_\_

q36: What is your highest level of completed education?

Primary school level (up to 8 years in school)	1
Secondary school level (9-10 years in school)	2
High school (11-13 years in school)	3
University level (more than 12 years in school plus college or university education)	4

q37: What is your estimate of your personal gross annual income? This means your total income before tax allowances and tax.

Up to NOK 100 000	1
NOK 100 000 – 299 000	2
NOK 200 000 – 299 000	3
NOK 300 000 – 399 000	4
NOK 400 000 – 499 000	5
NOK 500 000 – 599 000	6
NOK 600 000 – 799 000	7
NOK 800 000 – just below 1 mill.	8
NOK 1 mill or more	9
Did not want to answer	10
Did not know	11



## APPENDIX B: Questions introduced in the second data collection

q. 4: Do you work in the same place as you did when you participated in this study in May?

Yes	1
No, in a different establishment	2
No, I don't work in the hospitality business any more	3

.....

q. 13: Have you become more motivated, less motivated, or hasn't your motivation to stop smoking changed after the introduction of the total ban on smoking in bars and restaurants June 1<sup>st</sup>?

More motivated	1
Less motivated	2
No change	3

.....

(THE NEXT QUESTION WAS ONLY GIVEN TO THOSE WHO SMOKE AT WORK)

q. 15: Where do you smoke during work hours [når du er på jobb]?

Outdoor	1
Room for smokers	1
Under the kitchen fan	1
Storage room	1
Back room	1
Other	1
Don't know	1

.....

q. 17: How often did you use snus before the change in the legislation entered into force June 1<sup>st</sup> this year?

Daily	1
Sometimes	2
Did not use snus	3

q. 18: Approximately how many times per day did you use snus before the new legislation entered into force?

Write number: \_\_\_\_\_

q. 19: How often do you use snus now?

Daily	1
Sometimes	2
Don't use snus	3

q. 20: Approximately how many times per day do you use snus now?

Write number: \_\_\_\_\_

(SAME AS BASELINE QUESTION 28, BUT WITH A SLIGHTLY CHANGED WORDING:)

q28: What is your opinion regarding the introduction of smoke free bars and restaurants from June 1<sup>st</sup>? Are you mainly positive, negative or neutral?

Positive	1
Negative	2
Neutral	3

Q. 30: According to the present regulations, all tables and chairs in bars and restaurants must be smoke free. To what extent is this complied with at your workplace?

To a very large extent	1
To a large extent	2
To a small extent	3
Not at all	4
I don't know	5

.....

(SAME AS BASELINE QUESTION 32, BUT WITH A SLIGHTLY CHANGED WORDING:)

q32: Have you, at your workplace, done anything specific to make conditions more convenient after the introduction of the total ban for those who want to smoke a cigarette?

Yes	1
No	2
I don't know	3

.....

q34: Is snus sold at the bar or restaurant where you work?

Yes	1
No	2
I don't know	3

q. 35: Was snus sold there before the introduction of the total ban on smoking in bars and restaurants (June 1<sup>st</sup>)

Yes	1
No	2
I don't know	3

q. 36: Has your establishment been contacted by representatives from the snus producers and asked to sell snus in the bar or restaurant where you work?

Yes	1
No	2
I don't know	3

q. 37: Has your bar or restaurant been offered heating lamps, refrigerators for snus or spittoons [containers for disposal of used portions of snus] by representatives for the tobacco- or snus producers?

- |   |   |
|---|---|
| Yes, heating lamps                        | 1 |
| Yes, refrigerators                        | 2 |
| Yes, containers for used portions of snus | 3 |
| I don't know                              | 4 |

q. 38: I will now read aloud some statements regarding the establishment where you work. Please indicate how much you agree or disagree with these statements.

After the introduction of smoke free bars and restaurants and .....

There are lots of more cigarette butts  
on the street outside

It is more noisy outside our  
restaurant/bar

There are more complaints from  
neighbours

It is easier to keep our premises clean

The clothes we wear at work do not  
smell smoke anymore

q. 39: After the introduction of the total ban on smoking in bars and restaurants: Are there now more or fewer guests (customers), or is the number of guests the same as previously?

- |                       |   |
|-----------------------|---|
| Many more             | 1 |
| Some more             | 2 |
| About the same number | 3 |
| Some fewer            | 4 |
| Many fewer            | 5 |
| I don't know          | 6 |

q. 40: All things considered, how would you say that the introduction of the total ban on smoking has changed the atmosphere [stemningen] in your establishment? Have the guests become more satisfied, less satisfied, or is the atmosphere about the same as it used to be?

- |                |   |
|----------------|---|
| More satisfied | 1 |
| Less satisfied | 2 |
| About the same | 3 |
| I don't know   | 4 |