After the Smoke has Cleared: Evaluation of the Impact of a New Smokefree Law

Summary

A Report Commissioned and Funded by the New Zealand Ministry of Health

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Introduction

The report summarises an evaluation of the process and outcomes of the sections of the 2003 Smoke-free Environments Amendment Act (SEAA (2003)) relating to the extension of smokefree workplace from the provisions of the 1990 Smoke-free Environments Act (SEA (1990)). A comprehensive report with full referencing is available at www.moh.govt.nz. The aim of the evaluation was to identify goals and outcomes, direct anticipated and indirect and/or unanticipated, and determine the degree to which the goals of the SEAA (2003) were met; and the degree of adherence with underlying principles, values, and process objectives. Excluded is an evaluation of the impact of the SEAA (2003) on schools and early childhood centres.

The Smoke-free Environments Act (1990) and Smoke-free Environments Amendment Act (2003)

The SEA (1990) introduced restrictions on smoking in indoor workplaces, particularly in shared offices, and partial restrictions for licensed premises such as restaurants and meal-serving areas of pubs and other venues. There were no restrictions on non-meal serving areas of pubs, clubs and nightclubs. The SEAA (2003) was introduced following sustained advocacy efforts. This was partially in response to evidence that about 20% of the workforce continued to be exposed to secondhand smoke (SHS) in indoor workplaces, with greater exposure among blue collar workers and Māori. The immediate trigger was the March 2003 Health Committee report to Parliament, which recommended introducing a complete ban on smoking in all indoor workplaces including bars, casinos, members' clubs and restaurants.

The SEAA (2003) was passed by Parliament on 3rd December 2003 and extended the provisions of the SEA (1990) by making all schools and early childhood centres smokefree from 1st January 2004, and most other indoor workplaces smokefree from 10th December 2004. This included bars, casinos, members clubs and restaurants. There were specified partial exemptions, notably for prisons, hotel and motel rooms, and residential establishments such as long-term care institutions and rest homes. Dissemination of information about the forthcoming smokefree legislation occurred

through a range of methods to businesses, particularly the hospitality industry, and the public.

International experience of the evaluation of smokefree legislation and ordinances

The international literature on the experience of smokefree legislation is extremely positive from a public health and societal perspective. There is strong and consistent evidence that smokefree policies are effective at reducing SHS exposure, and improving air quality in the workplace and other indoor public places. There is some evidence that short-term adverse health effects such as respiratory symptoms and impaired lung function are reduced, particularly among heavily exposed occupational groups. The limited data available suggest that there will also be positive long-term health effects.

Smokefree policies are mostly well supported by the public and key stakeholders, particularly following implementation. Compliance is generally high, and the enforcement measures and enforcement infrastructure required are modest.

There is good evidence that introducing individual workplace policies reduces tobacco consumption and smoking prevalence within the affected workforce. However, it is unclear, largely due to methodological difficulties, whether smokefree legislation reduces the prevalence of smoking and tobacco consumption at the population level. There is evidence that comprehensive smokefree legislation reduces 'socially-cued' smoking (e.g. in bars and restaurants), and increases motivation to quit among smokers. The best available evidence suggests that the economic effects of smokefree legislation are broadly neutral or weakly positive on the hospitality industry and other sectors.

Methods

Development of the evaluation approach

Objectives and guiding principles for the legislation were identified from the SEAA (2003) and other key documentary sources. The main aim of the aspects of the SEAA (2003) that are the subject of this evaluation, was to reduce SHS exposure among the workforce in indoor workplaces, by extending protection to workers still exposed to

SHS in these settings after the SEA (1990). Key guiding principles identified were firstly that the SEAA (2003) should promote equity in health by improving health among groups disproportionately affected by tobacco smoking and SHS exposure, such as Māori, Pacific peoples, and low income groups. Secondly, policies should be congruent with the principles and provisions of the Treaty of Waitangi, including Māori participation, active protection of Māori interests and participation of Māori communities and organisations.

The Centers for Disease Control model for the evaluation of smokefree legislation and polices was adapted to the New Zealand context, and used to develop a logic model (Figure 1) to underpin the evaluation, and the following information areas for the core process measures, and core (direct, anticipated) and non-core (indirect, possible) outcomes:

Process evaluation:

- Public and stakeholder knowledge, attitudes and support for smokefree policies;
- Dissemination of information, enforcement activities and compliance monitoring;

Outcome evaluation:

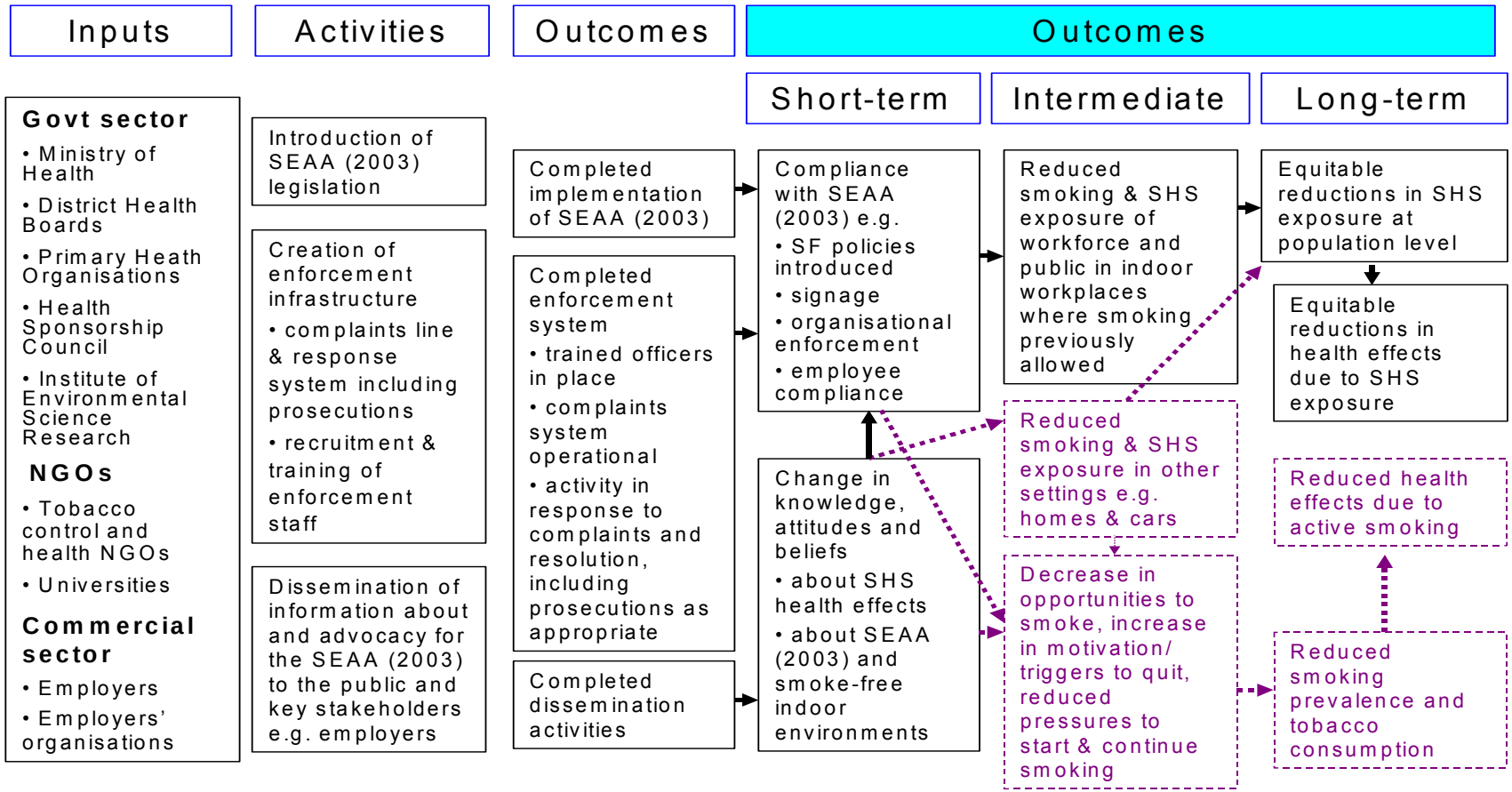
- Exposure to SHS in the workplace (core, and principal outcome measure);
- Exposure to SHS in public places and private places such as homes (non-core);
- Health impacts attributable to active smoking and SHS exposure (core);
- Smoking prevalence and smoking-related behaviours (non-core);
- Economic impacts (non-core).

Evaluation methods

For each of the process indicators, we identified possible data sources from knowledge within the project team, searches of the literature and contact with experts in tobacco control around New Zealand. We extracted relevant data, and summarised and appraised the evidence from each relevant source of information. Where summary data was not available or existing analyses were judged insufficient, we sought to obtain the raw data and carry out additional analyses or carried out additional studies. The latter included: an analysis of hospitalisation rates for a range of respiratory and cardiovascular diseases following implementation of the SEAA; a study exploring the experiences and attitudes of key stakeholders to the introduction and implementation of the SEAA; and two studies of indoor air quality in mainly hospitality industry

venues, using a portable air quality monitor to measure fine particulate ($PM_{2.5}$) levels.

Figure 1 Logic model for evaluation of the 2003 Smoke-free Environments Amendment Act



Results

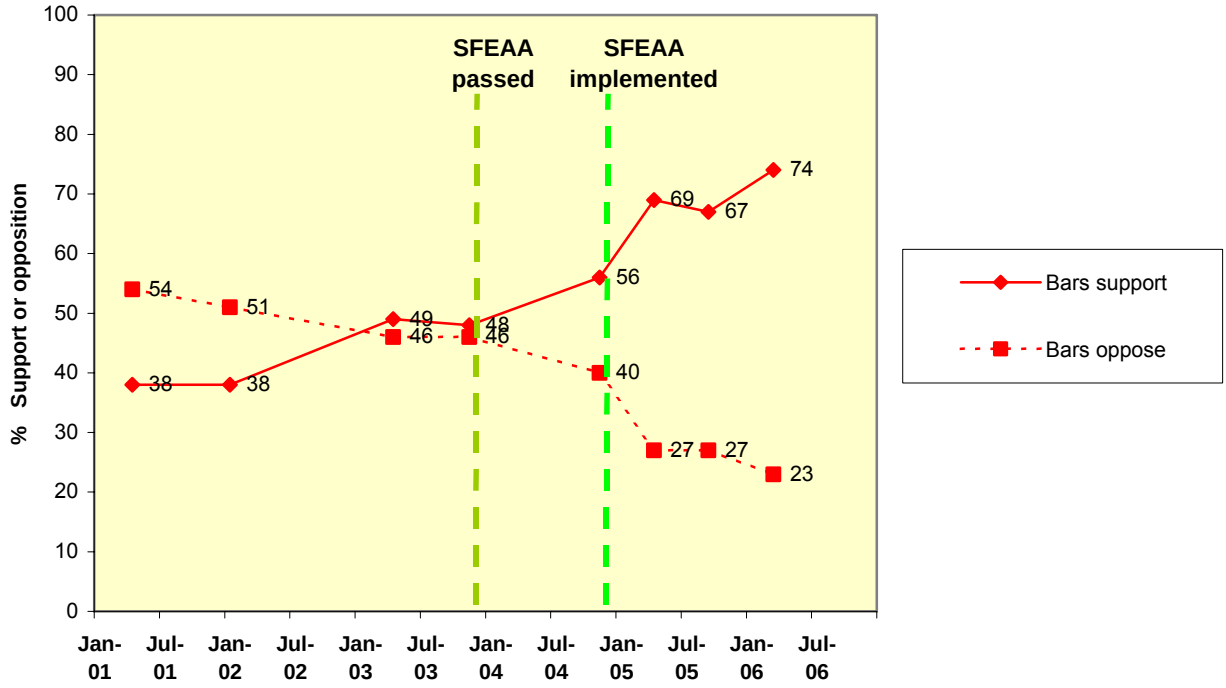
Public and stakeholder knowledge, attitudes and support for smokefree policies

The main sources of evidence were nationally representative surveys carried out by UMR research and the Health Sponsorship Council (HSC) before and after implementation of the SEAA (2003). There was also a survey of a cohort of bar managers and owners conducted by the HSC. There were some limitations to the data, mainly low response rates in the surveys and loss to follow-up in the cohort study. However, response rates between surveys were probably comparable and data collection methods were largely constant over time, so the trends reported should be robust.

The principal finding was that there was strong and growing support for the New Zealand smokefree legislation and its underlying principles. This support included all population sub-groups, including smokers, and bar managers and owners. For example, by 2006, the population surveys showed overwhelming support (over 90% agreement, and 6% or less disagreement) for the right to live and work in a smokefree environment; and for indoor workers, including bar and restaurant workers, to work in a smokefree environment.

There was also very strong support for smoking bans in bars and restaurants in the surveyed population. Figure 2 presents data from the UMR survey showing the increase in support for smoking bans in bars. Support was similar among men and women, Māori and non-Māori, and across all income groups. There was a similar increase in support for smoking bans in restaurants and cafés from 61% in January 2001, to 73% just prior to implementation in December 2004, and to 80% in 2006. By 2006 there was roughly equal support versus non-support among *smokers* for smokefree bars, and majority support for smokefree restaurants. Similarly, in the HSC surveys, support for banning smoking in restaurants increased from 73% in 2004 to 90% in 2006 (from 48 to 78% among smokers); and in bars and pubs from 61 to 82% (from 25 to 58% among smokers).

Figure 2 Support for smoking bans in bars from April 2001 to March 2006 in UMR Omnibus Surveys

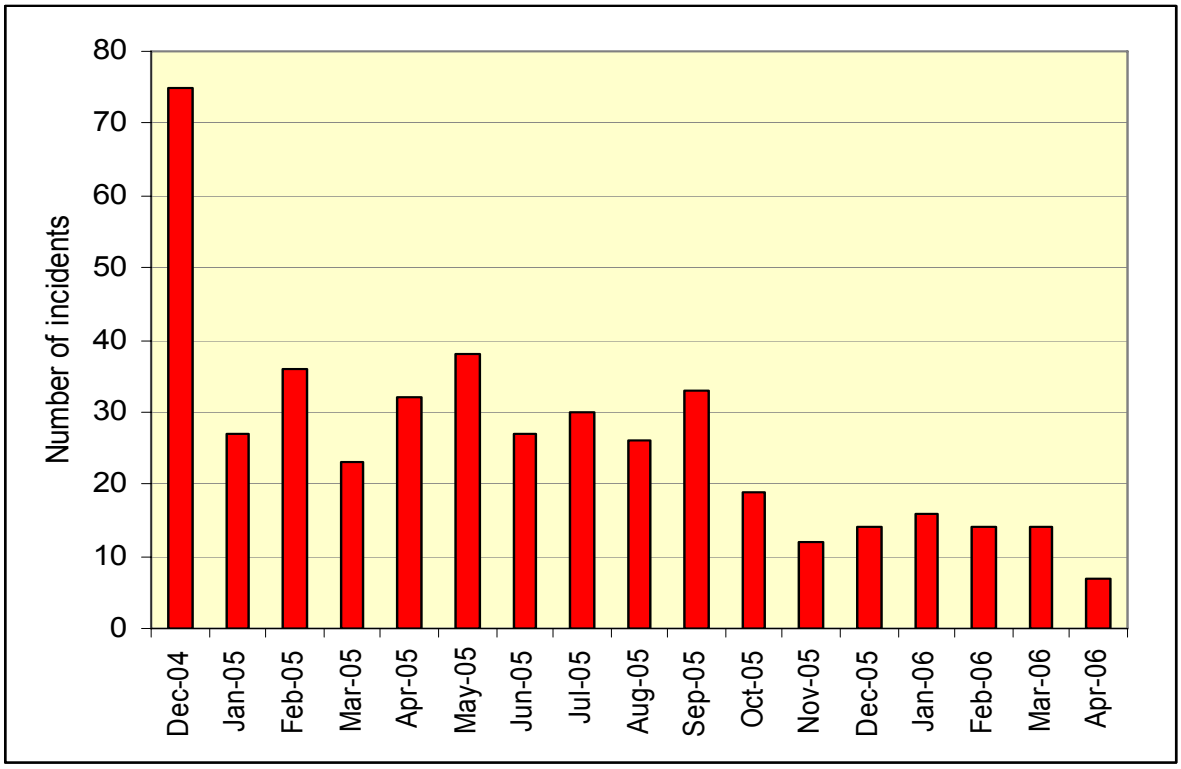


Dissemination of information, enforcement activities and compliance monitoring

Enforcement occurred largely through local enforcement officers in District Health Boards in response to complaints from the public to the Ministry of Health's freephone complaints line. The main sources of evidence on compliance and enforcement activities and outcomes were: three studies which observed compliance in 260 mainly bars and pubs in 2005-2006; data from the Ministry of Health complaints database; and a study involving the review of print media and 28 interviews with key stakeholders including representatives of employers, union and the hospitality industry; tobacco control NGOs; Ministry officials; local enforcement officers; and Māori stakeholders. The major limitation to the observational evidence was that it was mainly from urban pubs, with little or not data from other workplaces. Evidence of compliance from the complaints database, has inherent limitations since it is influenced by the public's knowledge of the legislation and their propensity to make a complaint.

Observed compliance in pubs and bars was close to 100%. Most complaints concerned smoking on licensed premises. The number of complaints fell rapidly after the first month, with less than 20 per month since October 2005 (figure 3). Most complaints were resolved through letters, telephone calls and visits by enforcement staff. Only five resulted in prosecutions.

Figure 3. Complaints about smoking in smokefree areas recorded on the national database between December 2004 and April 2006



Complaints are dated by the date of the reported violation, not the date the report was received

Stakeholders interviewed were mostly positive about the SEAA (2003). The legislation was seen as effective at protecting staff from SHS, and was mostly accepted, even among Hospitality Association of New Zealand members who had opposed its introduction. Interviewees welcomed the focus on SHS exposure in workplaces and schools, and praised the role of NGOs in implementation. Māori stakeholders were largely supportive of the legislation and the process of implementation. Ongoing problem areas identified included confusion over the definition of non-enclosed outdoor areas, lack of resources for enforcement, and non-coverage of workplaces such as prisons and residential homes and care establishments. Some interviewees suggested that there might be greater non-compliance in licensed premises in more remote rural areas, and in smaller businesses

with a high proportion of smokers.

Exposure to SHS in the workplace

Reducing SHS exposure among those still exposed to SHS in the workplace was the main outcome measure for the SEAA (2003). The main sources of evidence were the National Research Bureau (NRB) 1989-2001 surveys, 2003-2006 HSC Monitor surveys, the Institute of Environmental Science Research (ESR) Bar Customer Cotinine study, and the University of Otago air quality monitoring studies. The main limitations to the evidence were: lack of biomarkers and air quality data from non-hospitality workplaces; and lack of data on biomarkers of exposure among the hospitality sector workforce.

Prior to the SEAA (2003) at least 20% of the adult workforce was exposed to SHS in the workplace, with higher exposure among Māori and blue-collar workers (NRB 2001 survey). The greatest SHS exposure was among workers in the hospitality sector.

The ESR study found that SHS exposure, as reflected by changes in cotinine levels (a marker for exposure to tobacco smoke), among volunteers during visits to 30 pubs and bars reduced by about 90% post-SEAA (2003). In the University of Otago air quality studies the mean fine particulate ($PM_{2.5}$) levels in 37 bars and restaurants were far lower than found in an international comparative study from venues where smoking was allowed, and similar to those found in smokefree pubs in Ireland, and in other smokefree venues in New Zealand included in the international comparative study (figure 4). There was preliminary evidence that particulate levels in semi-enclosed outdoor smoking areas were high in some pubs and bars.

Self-reported SHS exposure indoors at work in the previous week fell from around 20% in 2003 to 8% in 2006 among employed adults. Reductions were greatest among Māori (figure 5). Workplace exposure in 2006 was highest among men, and workers in blue collar jobs such as labouring and operating machinery.

Figure 4 Respirable particles in smokefree venues in New Zealand studies and venues with smoking in 20 country comparison study

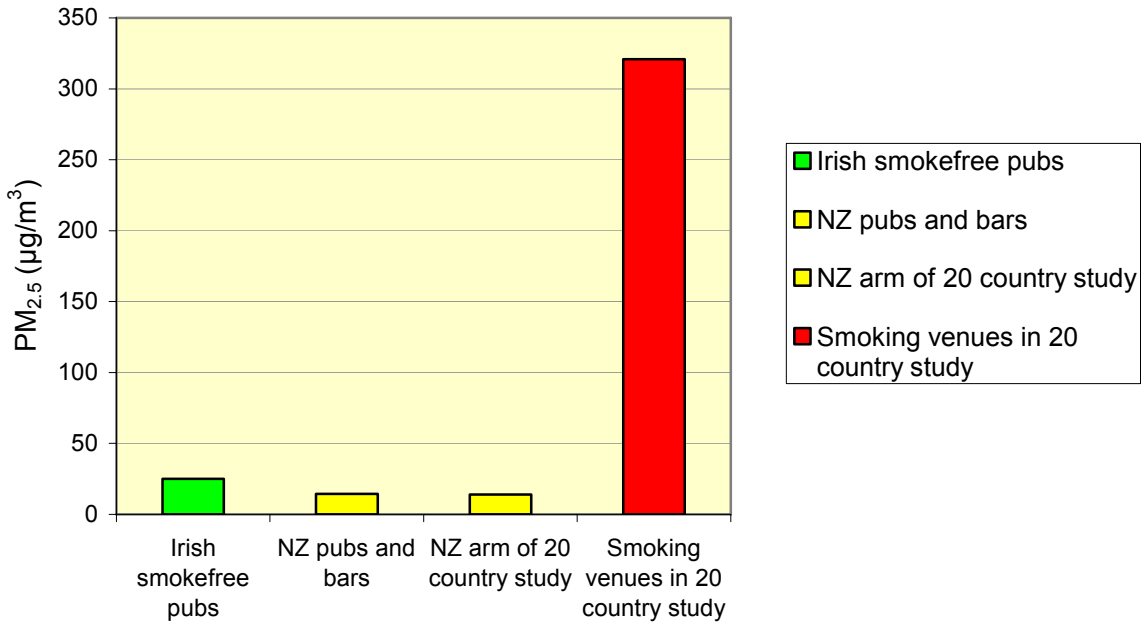
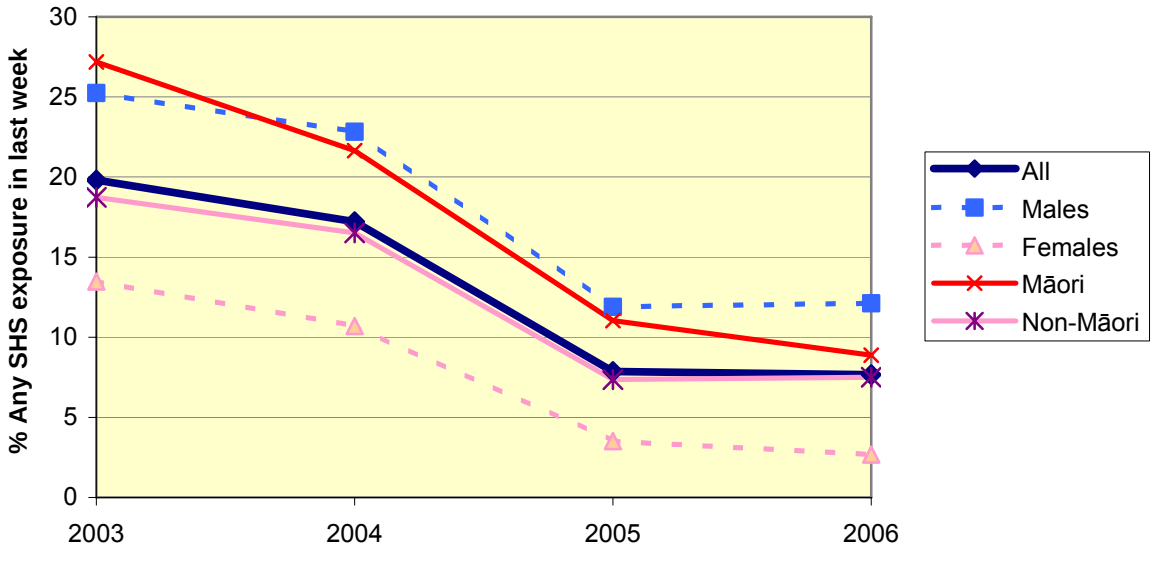


FIgure 5 Secondhand smoke exposure at work in previous week by ethnicity and gender, HSC Monitor Surveys 2003-6



Exposure to SHS in public places and private places such as homes

Restricting smoking in workplaces and public places may affect smoking in homes – different commentators have argued that it may increase or decrease SHS exposure in homes. The main sources of evidence were self-reports of SHS exposure in the home from the HSC Monitor surveys (2003-6), and by children from the National Year 10 Smoking surveys (2001-5). The key weakness to the evidence was the reliance on self-reported data on SHS exposure in homes.

Self-reported SHS exposure in the home in the HSC surveys fell from 20% in all households (42% of households with one or more smokers) in 2003, to 9% (30% of households with one or more smokers) in 2006. Reductions in self-reported SHS exposure in Māori households were more marked.

The proportion of homes that were reported as smokefree (no smoking allowed indoors) also increased during this time period. For example, the proportion of homes with one or more smokers and one or more children that subjects reported were smokefree increased from 64% in 2003 to 70% in 2006 in the HSC Monitor surveys. Reductions in self-reported SHS exposure and increases in smokefree home policies were more marked in Māori households, particularly among households with one or more smokers. For example, of households with one or more smokers and one or more children, 65% (95% CI 59% to 71%) of non-Māori and 59% (95% CI 52% to 65%) of Māori households were smokefree in 2003, by 2006 the figures were 68% (95% CI 60% to 76%) for non-Māori and 74% (95% CI 69% to 79%) for Māori. In the Year 10 survey, the proportion of children reporting smoking in the home decreased, but to a far lesser degree from 30.5% in 2001 to 26.5% in 2005, with no change in the downward trend between 2004 and 2005.

In the ESR study there was a decrease in the mean cotinine level of the volunteers prior to visiting the bars from 0.25 ng/ml in winter 2004 and 0.17 ng/ml in summer 2004 to 0.05 ng/ml in winter and spring 2005. As all the participants were non-smoking volunteers who reported no regular SHS exposure in the home or at work, this provides evidence of a general reduction in SHS exposure in other settings such as public places following implementation of the SEAA (2003).

Health impacts due to active smoking and SHS exposure

No data were available for this aspect of the evaluation, other than from a study carried out as part of this evaluation by a team at the University of Auckland. This involved an analysis of routinely collected hospitalisation information from July 1996 to December 2005 for a range of conditions that are potentially sensitive in the short term to a change SHS exposure, to see if there was a significant change in admission rates from the long term trends after implementation of the SEAA (2003).

Hospitalisation rates for acute asthma, acute stroke, unstable angina, and exacerbations of chronic obstructive pulmonary disease (COPD) were lower in the 12 months after implementation of the SEAA (2003), relative to the preceding 12 months; but these findings were not confirmed in a more rigorous analysis which adjusted for longer term trends and other potential influences on hospitalisation rates. There was therefore no clear evidence that the hospitalisation rate for these health outcomes reduced more than expected in the first 12 months after implementation of the SEAA (2003).

Possible reasons for the failure to demonstrate a significant change in health outcomes include: possible changes in exposure to the other causes for these conditions masking the effect of changes in SHS exposure; the limited amount of disease attributable to SHS exposure for these conditions (e.g. in comparison to active smoking); that the SEAA (2003) only directly addressed smoking in the workplace, whereas much SHS exposure occurs in the home and other private settings; and that the SEAA (2003) could only reduce SHS exposure among workers still exposed to SHS indoors in the workplace, a minority by 2004.

There is strong evidence that SHS exposure results in adverse health effects. There is good evidence that implementation of the SEAA (2003) had resulted in reduced SHS exposure in the workplace, and probably in other settings. Therefore, despite the failure of the hospitalisation study to demonstrate unequivocal health benefits, it is likely that health benefits due to the SEAA (2003) have occurred, and will continue to accumulate over time.

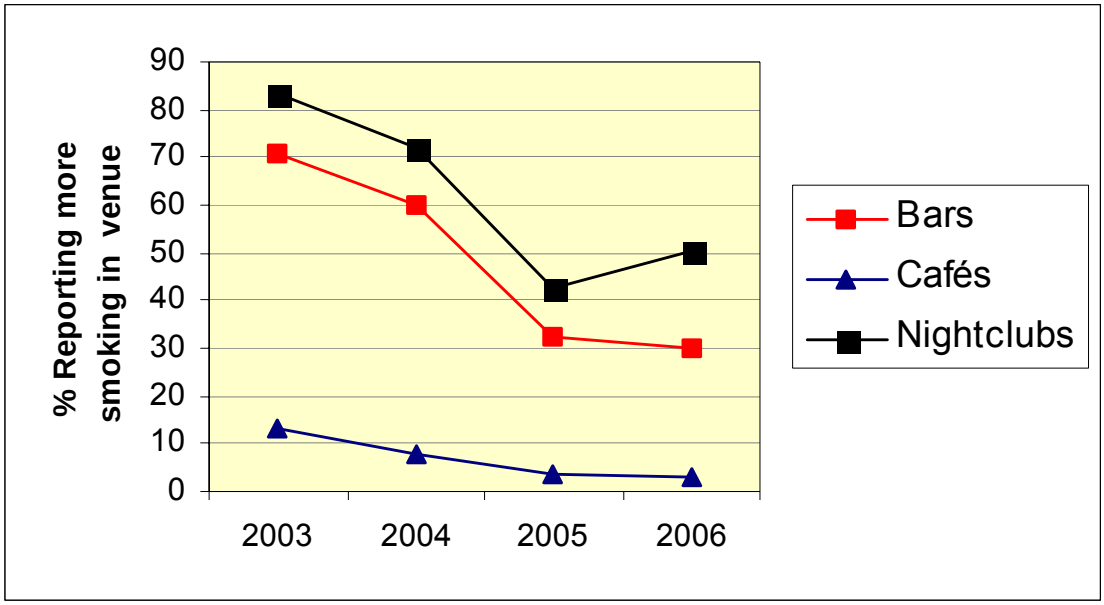
Smoking prevalence and smoking-related behaviours

The main sources of information were: data from Quitline on the number of caller

registrations and nicotine replacement therapy (NRT) exchange cards issued in relation to expenditure on television advertisements which promoted smoking cessation; HSC Monitor survey data on smoking behaviour in pubs and bars, restaurant and nightclubs (socially-cued smoking); Year 10 Smoking survey data on reported parental smoking prevalence; and data on supermarket tobacco sales and the amount of tobacco released onto the New Zealand market. A major gap in the data was the lack of up to date information on adult smoking prevalence.

For a six-month period after the law change, there was evidence of increased quitting-related behaviour, with increases in caller registrations and in the issuing of NRT exchange cards through Quitline. These findings were much stronger when adjusted for expenditure on television advertising promoting smoking cessation. Indeed, promotion of the Quitline was reduced in the six months after implementation of the SEAA (2003), suggesting that an important opportunity to maximise the numbers of smokers quitting was missed. There was evidence that socially-cued smoking (smoking more than normal) in bars, nightclubs, casinos and cafés substantially declined between 2003-4 and 2005-6 (figure 6).

Figure 6 Trends in respondents reporting smoking "more than normal" - in hospitality settings, HSC Monitor surveys 2003-6



Youth smoking rates decreased significantly between 2004 and 2005, but in line with long-term trends. There was a small reduction in reported parental smoking in the

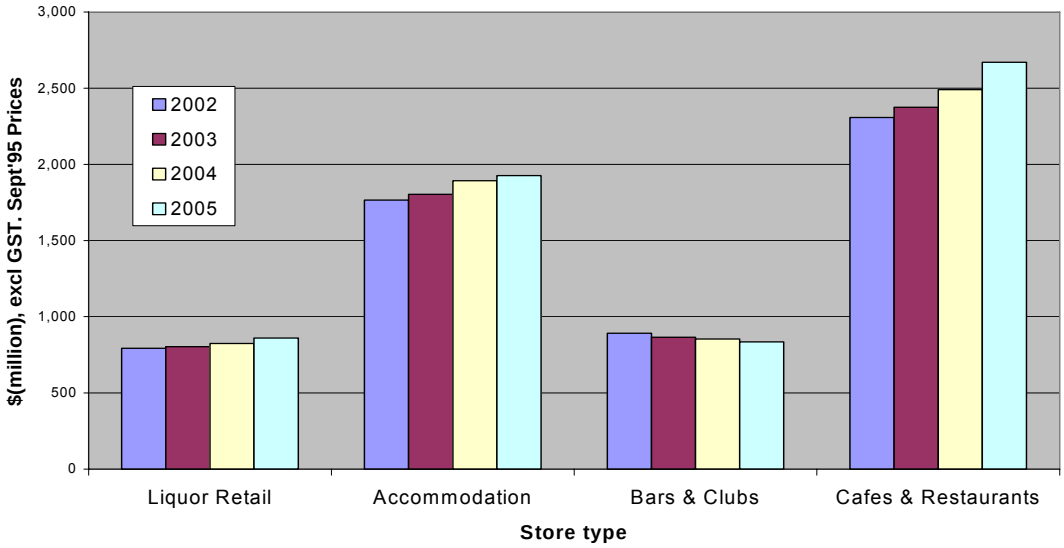
Year 10 survey between 2004 and 2005. The *per capita* release of tobacco onto the New Zealand market (a marker for overall consumption) was fairly constant from 2003-5, with no evidence of any change in 2005 following implementation of the SEAA (2003). There was a small decline in tobacco supermarket sales after the law change though this represents only a small proportion of the tobacco market, and may represent the continuation of long-term trends.

Economic impacts

The main sources of information were routinely collected economic activity data from the Statistics New Zealand website, as annual and quarterly time-series. This included data series on retail sales and employment by sector. Other data included economic activity data relating to construction in the hospitality industry and tourism numbers. Data on patronage of hospitality industry venues was available from the HSC Monitor surveys and on problem gambling from the problem gambling helpline and counselling data. Additional analysis of the retail sales data was carried out to adjust for the effect of long-term trends.

Data from the HSC Monitor surveys revealed little change in the reported patronage of bars and pubs between 2003-4 and 2005-6. There has been a downward trend in annual retail sales in bars and clubs since 2002 (figure 7).

Figure 7 Annual Total Retail Sales by four main liquor-selling store-types, 2002-2005. Source: Statistics New Zealand



Additional analyses which allowed for long term trends and seasonal variations suggested there was probably a modest additional reduction (around 4%) in retail sales of bars and clubs in the first quarter of 2005, with some evidence of displacement to liquor retailers for home sales. However, the effect was not sustained, and subsequent figures were in line with pre-existing trends. Patronage and sales for cafes and restaurants have increased steadily since 2002. The rate of increase was maintained or possibly slightly greater after implementation of the SEAA (2003). Trends in employment in these hospitality sectors largely mirrored the retails sales data.

There was evidence of decreased expenditure on gambling, and large falls in the numbers accessing the problem gamblers helpline and face-to-face counselling services in 2005.For example, the Gambling Helpline had 2875 new clients in 2005, representing a 33.1% decrease from 2004.This followed many years of increases in all these indicators. However, interpretation was complicated by concurrent implementation of the 2003 Gambling Act which aimed to control the harm caused by gambling.

The number of overseas visitors and their expenditure increased by 1.5% and 3.3% respectively in 2005, to record levels. However, the increase occurred in comparison

to 2004, a year in which there had been record numbers of visitors and the biggest annual percentage increase for 10 years. A factor, which may have depressed visitor numbers in 2005 was that, the New Zealand dollar was at historically high levels against the currencies of the three countries with the greatest numbers of international visitors to New Zealand.

Conclusion

In conclusion, despite some limitations and gaps in the evidence, the evaluation of the recent smokefree legislation in New Zealand adds further evidence to the positive experiences and outcomes from other jurisdictions such as Ireland, Norway, Scotland, New York, California that have recently introduced similar legislation.

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