

# **Review of the Evidence for Major Population-Level Tobacco Control Interventions**

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## Executive Summary

This review aimed to identify the most recent scientific evidence for the effectiveness of major population-level tobacco control interventions and to consider the findings and their implications in a New Zealand context.

It was based on searches of the peer-reviewed scientific literature but with a particular focus on “systematic reviews” ie, Cochrane Systematic Reviews (CSR) and reviews by the US Task Force on Community Preventive Services (TFCPS). The focus on the interventions was generally limited to addressing immediate determinants of smoking and current smoking behaviour rather than more upstream causes.

This work should be considered in conjunction with forthcoming reviews for the Ministry of Health relating to smoking cessation and tobacco-related harm-reduction (being undertaken by other groups). Policymakers and health workers also need to be aware of the many other considerations involved beside the *effectiveness* of specific interventions (eg, intervention reach, appropriateness for priority audiences, scope for reducing health inequalities and improving Māori health, and cost-effectiveness etc). Furthermore, it is necessary to consider that many interventions can work synergistically eg, effective interventions will generally be more effective if undertaken in a context of high tobacco prices and intensive mass media campaign activity.

The major findings of this review are detailed in the table below.

**Table 1: Summary of the findings of major reviews for major tobacco control interventions and relevant New Zealand-specific evidence** (with prioritisation for strength of evidence for effectiveness within sub-section)

<b>Intervention</b>	<b>Evidence from TFCPS / CSR*</b>	<b>Summary of other evidence (including New Zealand studies)</b>
<b><i>Strategies to reduce smoking initiation by children, adolescents, and young adults</i></b>		
Increasing the unit price for tobacco products	TFCPS: Strong scientific evidence	Other reviews also report strong evidence. The New Zealand data also indicate that tobacco tax reduces overall tobacco consumption. However, on the specific issue of youth smoking initiation the New Zealand data are more limited. Four studies indicate that youth are sensitive to the price of tobacco (ie, those with more available money are significantly more likely to purchase tobacco and to smoke).
Mass media campaigns and community interventions	TFCPS: Strong scientific evidence (for mass media when combined with other interventions)	Two other more recent reviews (since the TFCPS and CSR reviews) also provided evidence for mass media campaign effectiveness for reducing youth smoking. The New Zealand evaluation data are fairly limited.

Intervention	Evidence from TFCPS / CSR*	Summary of other evidence (including New Zealand studies)
	CSR: Limited for both mass media campaigns & community interventions	
School-based education (relating to smoking)	CSR: Social influences interventions are effective	Another major review also found evidence for social influences interventions in schools. Nevertheless, some of these programmes did not achieve statistically significant outcomes and there is insufficient evidence for particular combinations of school-based interventions. Systematic reviews for other school-based programmes show that some programmes are effective (eg, around physical activity and one aspect of alcohol control) – but there is insufficient evidence for various other programmes. The New Zealand specific evaluation data are limited and school-based interventions are not particularly intensive in this country.
Restricting youth access to tobacco	TFCPS: Sufficient evidence for “community mobilization when combined with additional interventions”  CSR: Limited evidence	The CSR described the evidence as “limited” for an effect of this intervention on the two variables of: youth perception of ease of access to tobacco and on smoking behaviour. New Zealand data are very limited but are consistent with some possible benefit on reducing sales to youth.
Smokefree sponsorship (of sports and cultural activities)	Nil identified	The available evidence for smokefree sponsorship is insufficient from a scientific perspective. Nevertheless, various studies from Australia and the overall pattern of evidence from New Zealand is suggestive of possible benefits around the end of tobacco industry sponsorship and its acceptability, the increase in smokefree policies and the reducing public acceptability of smoking in various settings.
Specific interventions of particular relevance to Māori and Pacific youth	Nil identified	The available evidence for specific interventions to reduce smoking initiation among Māori and Pacific youth in New Zealand is insufficient. There are also no clear reasons for why smoking has been declining amongst these youth. International evidence for youth smoking prevalence among indigenous Australians and for other Pacific peoples (outside NZ) is also insufficient and may be of limited relevance to NZ.

<b>Intervention</b>	<b>Evidence from TFCPS / CSR*</b>	<b>Summary of other evidence (including New Zealand studies)</b>
Media interventions relating to movies and television	Nil identified	The available evidence is limited but is suggestive that two interventions may be effective in reducing the impact of pro-tobacco imagery in the media: (i) parental restrictions on viewing R-rated movies; and (ii) showing antismoking advertisements before movies containing tobacco. Various other interventions are plausible based on logic (eg, changes to movie ratings) but effectiveness data on actual interventions is limited.

***Strategies to increase smoking cessation***

Increasing the unit price for tobacco products	TFCPS: Strong scientific evidence (for increasing smoking cessation and in reducing tobacco consumption)	Other major reviews support this (including one by the World Bank). The New Zealand-specific evidence has been reviewed and it provides support for taxation increases from a wide range of studies.
Mass media education – general / mixed-theme	TFCPS: Strong scientific evidence (when combined with other interventions)	Another major review provides additional support. New Zealand data are also supportive for general and mixed-theme campaigns, albeit being largely limited to how the audience responds in terms of Quitline calls. There is also evidence from evaluations of Australian campaigns (from which NZ campaigns are largely adapted).
Mass media education – Smoking cessation (quitting and maintenance)	TFCPS: Insufficient evidence (but based on data to May 2000)	Since the TFCPS review, some evaluation work has been published suggestive of beneficial impacts (with many of the Australian studies having potential relevance for New Zealand given the similarity of campaign content). Also the New Zealand experience strongly indicates that mass media campaigns can increase calls to the Quitline.
Mass media education – Smoking cessation contests	TFCPS: Insufficient evidence  CSR: Evidence for “Quit and Win” contests.  CSR: Insufficient evidence for “competitions and incentives”	The New Zealand evidence is very limited but is supportive of a benefit from Quit and Win contests.

<b>Intervention</b>	<b>Evidence from TFCPS / CSR*</b>	<b>Summary of other evidence (including New Zealand studies)</b>
Specific smoking cessation interventions of particular relevance to Māori and Pacific peoples	Nil identified	The available evidence is suggestive that mass media campaigns for smoking cessation are effective in engaging Māori and Pacific smokers in calling the Quitline. There is also evidence for the Quitline service and Aukati Kai Paipa services being effective for smoking cessation for Māori. But for other interventions (eg, smokefree sponsorship for Māori sports/culture and Pacific smoking cessation programmes) the evidence is insufficient. The evidence from interventions for indigenous Australians and Pacific peoples outside NZ is also insufficient and may be of limited relevance for New Zealand.
Enhancing alcohol control (re impact on tobacco)	Nil identified	The available evidence for this intervention is insufficient. Nevertheless, there is some evidence that indicates that tobacco and alcohol are generally complementary consumer products. This suggests (and there are some supportive studies) that intensifying alcohol control interventions (including higher alcohol taxes) will also tend to lower tobacco consumption for the population overall.
<b><i>Strategies to reduce exposure to second-hand smoke (SHS)</i></b>		
Enhanced smokefree area regulations	Nil identified (for beyond current interventions in NZ)	There is strong scientific evidence for workplace smoking restrictions (a TFCPS review, a CSR, a Surgeon General's Report, and other reviews). There is also strong New Zealand-specific evidence. Yet the evidence is still limited concerning enhancements for outdoor smokefree areas (bus stops, parks, beaches, hospital grounds, university campuses, and set distances from buildings). There is at present insufficient evidence for laws for smokefree cars where children are present.
Community education to reduce SHS exposure in the home and in cars	TFCPS: Insufficient evidence  CSR: Insufficient evidence	Despite the review findings, there are some studies that are suggestive of benefits (eg, including an intervention in a school setting). There is also some international evidence that comprehensive tobacco control programmes are associated with increased prevalence of smokefree homes. There is also some suggestive New Zealand evidence (including for mass media campaigns on SHS significantly increasing Quitline calls) and the prevalence of smokefree homes has increased in New Zealand.

<b>Intervention</b>	<b>Evidence from TFCPS / CSR*</b>	<b>Summary of other evidence (including New Zealand studies)</b>
<i>Regulatory interventions for product and marketing</i>		
Tobacco industry restrictions (regulation of product design)	Nil identified (fire-safe cigarettes)	There is now clear evidence to show that jurisdictions can act to require cigarette design changes and that these design changes are subsequently made by the tobacco industry (ie, for fire-safe cigarettes). In particular, cigarette performance with regard to burn characteristics can be changed as a result of such laws. Although there is insufficient evidence concerning the impact of such laws on the prevalence of cigarette-related fires, logic would suggest that reduced fire rates are likely to follow.
Tobacco industry restrictions (regulation of content)	Nil identified (for nicotine, tar or other constituents)	There is insufficient evidence concerning the regulation of nicotine, tar or other cigarette constituents. Nevertheless, some laboratory evidence is suggestive of possible public health benefits and so further research is probably well justified. There is however, evidence that tobacco industry actions can potentially subvert public health efforts to alter cigarette content.
Enhanced point-of-sale restrictions (and enhanced enforcement of the law)	Nil identified	There is evidence from a CSR that tobacco promotion increases youth smoking. There is also some evidence from another review that restrictions on tobacco marketing are associated with lower smoking rates. Collectively these probably provide adequate evidence from a scientific public health perspective to maximise restrictions on tobacco promotion – including retail displays. Although some jurisdictions have enacted complete restrictions on retail displays, evaluations have not been published.

\*TFCPS – United States Task Force on Community Preventive Services  
CSR – Cochrane systematic review

Acting on the interventions in the Table above often involves a national-level response. Nevertheless, the last section of this report also details possible District Health Board (DHB) options for research or local/regional-level interventions.

**Conclusions:** The international literature reports high quality scientific evidence for a number of the population-level tobacco control interventions used in New Zealand. In many cases there is supportive New Zealand-specific scientific evidence for such interventions being effective. New Zealand policy-makers and health workers can be very confident in the scientific basis for major components of the current New Zealand tobacco control programme. Nevertheless, there remain some population-level interventions for which the evidence-base is limited or insufficient and for which further research may be required before their appropriate role can be more accurately defined.

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### **Disclaimer**

Although commissioned by the Ministry, none of the content of this report should be assumed to be current Ministry of Health policy unless it is also detailed in other Ministry documents such as the five year plan for tobacco control: <http://www.ndp.govt.nz/policy/tobacco.html>).

## 1 Introduction

This review aimed to identify the most recent scientific evidence for major population-level tobacco control interventions and to consider the findings and their implications in a New Zealand context. It seeks to answer the questions: *how* effective are major interventions for tobacco control and what is the New Zealand-specific evidence for effectiveness?

The last similar review commissioned by the Ministry of Health was based on literature available in late 2002 [Wilson 2003]. Given the New Zealand health sector's major on-going investment in tobacco control, it is timely that a new review be conducted so that tobacco control at both the national and district health board (DHB) level can be optimally designed (ie, to maximise efficiency in benefiting public health, reducing the economic burden of tobacco use, and to maximise reduction in health inequalities). Such a review is also timely given that the Ministry has also commissioned forthcoming reviews on smoking cessation and tobacco-related harm-reduction [New Zealand Health Technology Assessment (NZHTA) 2006].

Given the vast range of possible population-level tobacco control interventions, this work has generally focused on just the major interventions. It has also attempted to include evidence from New Zealand-specific research where this has been published.

## 2 Methodology of this review

**Scope:** This review focused on the evidence for effectiveness of major population-level tobacco control interventions rather than those designed for specific individuals. The list of interventions was derived from the previous review [Wilson 2003] and with some additions agreed to in advance with Ministry of Health staff. The focus on the interventions was relatively narrow and generally was limited to the immediate determinants of smoking and current smoking behaviour rather than more upstream causes.

Consequently, the following intervention areas were not specifically addressed. These could potentially be considered in future reviews:

- Interventions to further reduce the upstream determinants of smoking such as poverty among low-income New Zealanders (socio-economic disadvantage is a risk factor for smoking initiation and for not being able to quit) [Wilson et al 2006; Fergusson et al 2007].
- Interventions to further enhance educational levels for children of low-income families (poor school achievement is a risk factor for smoking according to longitudinal data from New Zealand [Fergusson et al 2007]).
- Interventions to further reduce income inequalities and unemployment levels.
- Interventions to reduce racial discrimination (given that there is New Zealand specific evidence around the association between such discrimination and smoking [Harris et al 2006a; Harris et al 2006b]).
- The impact of intensive combinations of the various interventions detailed in this review. For example, many of these interventions are likely to have synergistic effects.
- Interventions to increase the unpaid media coverage of tobacco-related matters.
- A complete re-design of the system for tobacco availability such as adopting non-commercial supply [Borland 2003; Callard et al 2005; Thomson et al 2005a]. Such considerations could build on US, Canadian and Scandinavian experience with national or state/provincial government control of alcohol distribution.

Likewise, some downstream effects of interventions are not addressed. For instance, the effect of increased smokefree areas in reducing smoking initiation, and increasing quitting, is not fully developed in this document. Quitlines are not evaluated as such except in Section 4.6, but the related mass media campaigns are considered in sections 4.4 and 4.5. (Quitlines involve a mix of population-level and individual-level features).

Furthermore, an update of the economic aspects of the various interventions (see the previous review [Wilson 2003] for some details) could be undertaken. Of note however, is the complexity of comparing cost-effectiveness analyses between countries and over time.

**Systematic reviews:** This review is based primarily on the findings of systematic reviews identified in January 2007 from the following sources:

- The Cochrane Library (Issue 4, 2006) – the “Tobacco Addiction” group (<http://www.cochrane.org/index.htm>).
- Reviews listed in the Database of Abstracts of Reviews of Effectiveness (DARE) on the Cochrane Library website. ([http://www.mrw.interscience.wiley.com/cochrane/cochrane\\_search\\_fs.html](http://www.mrw.interscience.wiley.com/cochrane/cochrane_search_fs.html)).
- The Health Technology Assessment Database in the Cochrane Library ([http://www.mrw.interscience.wiley.com/cochrane/cochrane\\_search\\_fs.html](http://www.mrw.interscience.wiley.com/cochrane/cochrane_search_fs.html)).
- The United States Task Force on Community Preventive Services (TFCPS). (<http://www.thecommunityguide.org/tobacco/default.htm/>).

These groups of reviews each contain a number of reviews on particular subject areas. The reviews have been conducted at different times.

The recent reviews by the United States Preventive Services Task Force (<http://www.ahrq.gov/clinic/uspstfix.htm>) and the Canadian Task Force on Preventive Health Care (<http://www.ctfphc.org/>) were examined (January 2007) but these reviews were generally related to individual-level tobacco control interventions.

**Medline searches:** Numerous Medline searches for articles relating to tobacco control interventions were conducted for the period 1 January 2002 to 20 January 2007 (ie, to allow some overlap with the previous 2002 review). A particular focus was on “systematic reviews”, other “reviews”, “randomised controlled trials” and articles relating to “New Zealand” and “Maori” and “Pacific”. Specific examples include the following search word combinations:

- “systematic review” and (smoking or tobacco)
- Cochrane and (smoking or tobacco)
- “Preventive Services Task Force” and (smoking or tobacco)
- Zealand and (smoking or tobacco)
- Maori and (smoking or tobacco)
- Pacific and prevention and (smoking or tobacco)
- tobacco tax review
- Zealand and (price or tax)
- tobacco and alcohol and (complementary or co-addiction or substitute)
- Zealand and alcohol and (smoking or tobacco)
- Zealand and schools and (smoking or tobacco)

**Non-Medline indexed literature:** To identify New Zealand literature that was not Medline-indexed, the following websites were examined for reports and studies: the Ministry of Health, the Quit Group, the Health Sponsorship Council, the Cancer Society, the Heart Foundation and ASH (New Zealand). For a number of other specific searches the non-Medline indexed literature was identified with the search engine *Google Scholar*.

**Grading of evidence:** This document focused predominantly on the results of major systematic reviews eg, by the TFCPS and the Cochrane Collaboration. No specific system of evidence grading was used to rank the evidence from these reviews and instead the exact words used in major reviews were quoted eg, “strong scientific evidence” or “sufficient evidence” or “insufficient evidence”.

When interpreting these statements it is important to recognise that even where the evidence for a tobacco control intervention is described as “insufficient” or “limited”, interventions might still be justified on various grounds. For example:

- If the evidence is weak because the intervention is in an early stage of development, or if the evaluation methodology had limitations [Rychetnik et al 2002].
- If the government or health sector wishes to take a precautionary approach in the face of potentially large and important risks to public health.
- If the intervention assists in achieving equity goals, or is justified on ethical grounds (eg, consumer rights for information about a hazard from tobacco).
- If a specific tobacco control intervention has not been adequately evaluated but there is strong scientific evidence from other public health domains that may be generalisable (eg, from the alcohol control literature).

**Limitations of this review:** When considering the findings of this review, readers need to consider its various limitations:

- The scope had various limitations (see above) and the major focus was on systematic reviews and other reviews (rather than individual studies).
- While the identification of systematic reviews is likely to be complete (given the overlap of the search strategies used) – only a tiny fraction of the Medline-indexed literature was examined in any detail. For example, the search term “Zealand and (smoking or tobacco)” has 349 entries for the five-year period 2002-2006 alone. Similarly, the search term “review and (smoking or tobacco)” has 6040 Medline entries for this period.
- While Cochrane systematic reviews have been shown to be of higher quality and to be less biased on average than other systematic reviews – they still have limitations. For example, major problems were identified in 29% of Cochrane systematic reviews published in 1998 [Olsen et al 2001]. Also a flawed Cochrane systematic review had to be retracted after being published in 2004 [Rada 2005]. The methodology of tobacco-related Cochrane systematic reviews are also debated (eg, [Walsh 2007]).
- The review was undertaken by a single person and with only one external peer reviewer (albeit with additional peer-review by Ministry of Health staff).
- Some of the findings of international studies may not be fully applicable to the New Zealand context, and it is not always clear that a review finding may have limited generalisability to the New Zealand context. Relatively unique characteristics of the New Zealand setting include: (i) Māori, and the Treaty relationship between Māori and the Crown; (ii) the Pacific population from many different Pacific Island countries; (iii) the Asian New Zealand population; and (iv) the relative isolation of some rural populations in parts of the country.

Finally, just because there is scientific evidence for a particular tobacco control intervention does not mean that it should be implemented by the health sector. For example, it may be reasonable for the intervention not to be used because:

- The effect size may be fairly minor or the intervention may have low levels of population reach.
- The cost might be high (and therefore make the intervention relatively cost-ineffective).

- The intervention may not reduce (or may even exacerbate) inequalities in smoking prevalence (ie, if there is relatively higher uptake of the intervention by higher-income smokers).
- The intervention may not be acceptable or appropriate for various ethical or cultural reasons.

### 3 Strategies to reduce smoking initiation (population-level)

#### 3.1 Increasing the unit price of tobacco

**Background:** There is a long history of countries using tobacco tax to raise revenue for government and (more recently) as a tobacco control measure. New Zealand has also used tobacco tax for these purposes [Wilson & Thomson 2005]. This Section considers the evidence for tobacco tax on smoking initiation, while Section 4.1 considers tax from a smoking cessation perspective.

**Evidence for effectiveness:** There is “strong scientific evidence” that increasing the price of tobacco products reduces tobacco use prevalence and consumption among both adolescents and young adults according to the TFCPS review. The price elasticity of demand for tobacco use participation was estimated to range from  $-0.07$  to  $-0.52$  (median =  $-0.37$ ). It was also noted that two other major reviews had also reported that tobacco price increases reduce the uptake of smoking and tobacco consumption by young people [Jha & Chaloupka 1999; United States Department of Health and Human Services 2000].

More recently, another review has been published [Liang et al 2003]. It concluded that “the most consistent finding in this literature is that higher cigarette prices discourage youth smoking”. Similarly, another review reported that “we conclude that increases in price affect teen smoking to a great degree” [Ding 2005]. This review estimated that for a 10 percent increase in prices, a 15 percent decrease in cigarettes consumed could be accomplished.

Other recent relevant work includes two reviews of tobacco industry internal documents. One notes that the documents show that “tax related and other price increases lead to significant reductions in smoking, particularly among young persons” [Chaloupka et al 2002a]. Another, on tobacco tax in Hungary [Szilagyi & Chapman 2003] found that “appropriate pricing strategies and lobbying for low tobacco tax policies were used by the tobacco industry in Hungary to keep cigarettes affordable to the public.” A result of the various tobacco industry strategies was the “adoption of governmental policy aimed at delaying the introduction of the EU directive on the minimum tax levels of retail prices of cigarettes.”

**New Zealand evidence:** The New Zealand experience with tobacco tax has recently been reviewed [Wilson & Thomson 2005]. This review found that:

“The New Zealand evidence indicates that increases in tobacco prices are associated with decreases in tobacco consumption in the general population over the long term. This finding comes from multiple studies relating to: tobacco supplies released from bond, supermarket tobacco sales, household tobacco expenditure data, trends in smoking prevalence data, and from data on calls to the Quitline service. For the 1988–1998 period, the overall price elasticity of demand for all smoking households was estimated to be such that a 10% price increase would lower demand by 5% to 8%. Two studies are

suggestive that increased tobacco affordability is also a risk factor for higher youth smoking rates.”

However, the New Zealand data on tobacco price increases and youth smoking and smoking initiation is still fairly limited. Two studies using different survey data of year 10 students suggest that cigarette smoking is positively related to the amount of pocket money provided to adolescents [Scragg et al 2002; Scragg et al 2003]. Similarly, a multi-regional survey found that buying cigarettes by secondary school students was associated with them having “more money to spend” [McGee et al 2002].

A study of disposable income amongst students with a mean age of 15.0 years has also been conducted [Darling et al 2006a]. It found that as income increased, purchasing of cigarettes also increased significantly (with a dose-response gradient and after adjusting for other variables).

**Summary of the evidence:** There is “strong scientific evidence” that increasing the price of tobacco products reduces tobacco use prevalence and consumption among both adolescents and young adults (based on a systematic review and other reviews). The New Zealand data also indicate that tobacco tax reduces overall tobacco consumption. However, on the specific issue of youth smoking initiation the New Zealand data are more limited. Four studies indicate that youth are sensitive to the price of tobacco (ie, those with more available money are significantly more likely to purchase tobacco and to smoke).

**Comments on the evidence:** Reducing the uptake of smoking is only one of the potential benefits of raising tobacco taxes (see Section 4.1 on increasing cessation). But reducing youth uptake may also be the best reason for tobacco tax. For example, a group of economists convened in 1995 by the United States Office on Smoking and Health concluded that the value of discouraging children from becoming addicted to nicotine was potentially the most powerful argument for increased tobacco taxation [Warner et al 1995].

The TFCPS review found two studies that showed that African American adolescents were more responsive to differences in product price than white/European adolescents. This information may be of relevance when considering the potential impact of prices on smoking by Māori and Pacific peoples in the New Zealand context.

The New Zealand evidence around tobacco tax is fairly substantial and is consistent with the international evidence. However, on the issue of price and youth smoking initiation, the data are still fairly limited.

**Comments on implications for New Zealand:** There is sufficient scientific evidence to justify further increasing tobacco tax levels in New Zealand to reduce smoking initiation. Nevertheless, the case would be further strengthened if there were more specific research data on the issue of price and youth smoking initiation in the New Zealand context. There is also a critical need for research on the barriers to adopting

tobacco tax increases within the policy-making process in New Zealand (and internationally).

### 3.2 Mass media campaigns and community interventions

**Background:** Mass media campaigns have been extensively used internationally for tobacco control. They may have advantages over most forms of health promotion for tobacco control in terms of reach, particularly to low-income audiences.

“Community interventions” involve the use of co-ordinated, widespread, multi-component programmes to try and influence behaviour. They often involve a mix of programmes for prevention of disease (like heart disease), and often include school or local programmes as well as mass media programmes. These interventions usually include some mass media components and so are also considered in this section.

Within mass media campaigns to reduce smoking initiation, there are some particular subgroups. One important subgroup is the ‘counter-industry’ campaigns that focus on *tobacco industry* behaviour as a way of changing youth behaviour, rather than focusing on *youth* behaviour [Farrelly et al 2005; Hersey et al 2005a; Hersey et al 2005b]. Another way of differentiating campaign types is between those that suggest “social threats” as opposed to “physical threats” from smoking [Kwai-Choi Lee et al 2003].

**Evidence for effectiveness (mass media campaigns):** There is “strong scientific evidence” that mass media campaigns are effective in reducing smoking prevalence in adolescents when combined with other interventions (based on a systematic review by the TFCPS). These “other interventions” include excise tax increases, school-based education programmes, contests, and community education programmes. However, the TFCPS reported that there was inadequate information to determine the contribution of each of the individual components of these interventions to the overall effectiveness of the combined approach.

A Cochrane systematic review also covered mass media interventions for preventing smoking among young people [Sowden & Arblaster 2000]. It concluded that: “there is some evidence that the mass media can be effective in preventing the uptake of smoking in young people, but overall the evidence is not strong”.

A more recent review examined the impacts of US-based mass media campaigns [Friend & Levy 2002]. The authors reported that “well-funded and implemented mass-media campaigns targeted at the general population and implemented at the state level, in conjunction with a comprehensive tobacco control program, are associated with reduced smoking rates among both adults and youth.” Specific findings of note with respect to youth were:

- Two studies of the Massachusetts campaign reported that fewer exposed youths took up smoking compared with youths in other US states.
- Two youth-orientated state-wide campaigns were associated with reductions in smoking rates (in Arizona and in Florida).

- Some studies of the Californian campaign found no significant difference between youth exposed to the campaign and unexposed youth in the rates of thinking about stopping smoking. But other studies found that exposure to the campaign significantly reduced smoking prevalence and rates of starting smoking.

A CRD critique of this review has been undertaken [Centre for Reviews and Dissemination 2006a]. It reported many limitations with the review by Friend and Levy including: the inclusion criteria were not defined in terms of the study design; the full list of databases searched was not reported and the search terms were not detailed; the methods for study selection were not described; validity was not formally assessed; and adequate information on the included studies was not provided. Despite this, there were some desirable methodological aspects to the review and the CRD commentators considered that “the evidence presented appears to support the authors’ conclusions.”

Another review of youth tobacco prevention mass media campaigns was published in 2003 [Farrelly et al 2003]. It reported that:

“Careful examination of the accumulated evidence provides some insight into the characteristics of effective campaigns. Foremost, it is clear that substantial levels of campaign exposure are required before anti-tobacco efforts are likely to have an effect. Several studies also suggest that anti-tobacco media campaigns are most likely to be effective when complemented by school or community based interventions. However, the national truth<sup>sm</sup> campaign and campaigns in Florida, Kentucky, and Norway imply that well funded, carefully planned, and specifically targeted media campaigns in isolation can affect teen smoking behaviour. Evidence from evaluations of experimental, state, and national anti-tobacco media campaigns does not illuminate a central message strategy that is associated with consistent behaviour change.”

There are a number of notable studies published since these reviews. Examples of such work around just one campaign (the “truth” campaign in various US states and particularly Florida) are detailed below:

- A study of Florida’s “truth” campaign which was a type of tobacco countermarketing campaign aimed at youth was published in 2004 [Niederdeppe et al 2004]. This study provided additional evidence the campaign was successful in reducing smoking amongst teenagers in Florida. Smoking rates were substantially lower among Florida teens between fall 2001 and spring 2002 (in contrast to previous studies that had found comparable rates before the launch of the campaign). The other main findings were that Florida teenagers had higher levels of “truth” campaign awareness and were more likely to agree with campaign-targeted beliefs.
- Another study used data from the Monitoring the Future survey in a pre/post quasi-experimental design to relate trends in youth smoking prevalence to varied doses of the “truth” campaign in a national sample (of approximately 50,000 students) [Farrelly et al 2005]. It reported that “smoking prevalence

among all students declined from 25.3% to 18.0% between 1999 and 2002 and that the campaign accounted for approximately 22% of this decline”.

- The impact of the “truth” campaign on youth in tobacco producing states (TPS) versus other states has also been studied [Thrasher et al 2004]. This work found that reactions to advertisements did not differ by state type. “Multivariate adjusted time trend analyses indicated significant, comparable increases in anti-industry attitudes/beliefs since the onset of the truth campaign, in both TPS and non-TPS. Mediation analyses indicated that these increases were due, in part, to campaign exposure.”
- A study using telephone survey data examined how the “truth” campaign may have worked [Hersey et al 2005a]. It reported that “consistent with concepts from the theory of reasoned action, youth in markets with higher levels of campaign exposure had more negative beliefs about tobacco industry practices and more negative attitudes toward the tobacco industry.” “Models also provided support for a social inoculation effect, because negative industry attitudes were associated with lower receptivity to protobacco advertising and with less progression along a continuum of smoking intentions and behavior.” Other national survey data provide evidence that the “truth” brand mediates the relationship between “truth” campaign exposure and youth smoking [Evans et al 2005].

When considering counter-industry campaigns more broadly, one study has compared rates of youth smoking in three groups of states [Hersey et al 2005b]. These were: (i) those with long funded counter-industry campaigns (California, Florida, and Massachusetts); (ii) states with more recently funded counter-industry media campaigns (Indiana, Minnesota, Mississippi, and New Jersey); and (iii) other states. This study found that rates of current smoking and established smoking decreased significantly faster in states with established or more newly funded counter-industry campaigns than in other states. The authors considered that “state counter-industry campaigns appear to prime, or make more salient, negative perceptions about tobacco industry practices.”

Australian work has also considered the impact of adult-focused campaigns (the Australian National Tobacco Campaign) on adolescents [White et al 2003]. This found that:

“Among the national evaluation sample, 85% of adolescent smokers thought the campaign was relevant to them. Fifty three per cent indicated that the campaign had led some teenagers to at least try to quit and 85% thought it made smoking seem less cool and desirable. Among students who were established smokers the campaign generated quitting activity, with 27% cutting down the number of cigarettes they smoked and 26% having thought about quitting. CONCLUSION: Results indicate that adolescents were very aware of this adult focused anti-smoking campaign and thought it relevant to them. The findings suggest that a graphic health effects cessation focused campaign may have been successful in promoting anti-smoking attitudes among adolescents.”

**Evidence for effectiveness (community interventions):** A Cochrane systematic review has also considered “community interventions” that reported results for young people aged under 25 years [Sowden et al 2003]. The review selected 17 studies and another 46 did not meet the inclusion criteria. The review reported that of the 13 studies which compared community interventions to no intervention controls, two reported lower smoking prevalence in young people. These interventions were part of cardiovascular disease prevention programmes. Other findings of note were:

- “One study reported a lower rate of increase in [smoking] prevalence in a community receiving a multi-component intervention compared to a community exposed to a mass media campaign alone.”
- “One study reported a significant difference in smoking prevalence between a group receiving a media, school and homework intervention compared to a group receiving the media component only.”

The authors of this review concluded that “there is some limited support for the effectiveness of community interventions in helping prevent the uptake of smoking in young people”. They also noted that coordinated multi-component programmes can reduce smoking among young people more effectively than single strategies alone.

**New Zealand evidence:** Most of the tobacco-related mass media campaign efforts in New Zealand have been focused on smokefree environments and in encouraging smoking cessation by adults. There has been one low-budget mass media campaign aimed at young people, the “Hei Aha Te Kai Paipa? –Why Start?” campaign. This cost around \$1m for each of three years, and used a variety of themes including “health threat” themes [Kwai-Choi Lee et al 2003]. While there were no Medline-indexed evaluations of this campaign identified, there was some limited evidence reporting a “high level” of campaign awareness among young people [Ministry of Health 1998]. Also, the smoking in pregnancy component of this campaign was studied. An evaluation of a small sample (n=55) of pregnant women was suggestive of a low level of awareness of the campaign at only one-third recalling advertisements (unprompted) [Watene et al 1999]. But there was some suggestion of an attitudinal shift from the pre-contemplative or contemplative stages towards action favouring quitting or cutting down.

Also, at around the time this “Why Start?” campaign was run, it was not associated in time with any reduction in the national smoking prevalence levels of school students (for trend data see: [Laugesen & Scragg 1999b]).

The impact of adult-focused smoking cessation media campaigns on youth in New Zealand is not known. Nevertheless, there is New Zealand evidence that uptake of smoking is influenced by parental smoking [Fergusson et al 2007].

**Summary of the evidence:** According to the systematic review by the TFCPS there is “strong scientific evidence” that mass media campaigns are effective in reducing smoking prevalence in adolescents when combined with other interventions. The evidence according to a Cochrane systematic review for mass media campaigns is more limited and this is also the case for the effectiveness of community interventions. Two other more recent reviews also provided evidence for mass media

campaign effectiveness for reducing youth smoking. The New Zealand evaluation data are fairly limited.

**Comments on the evidence:** There is probably a need for further evaluation studies concerning mass media campaigns and community interventions to reduce youth smoking. Future reviews may also need to incorporate more recent evaluation studies of the youth orientated mass media campaigns eg, of the “truth” campaign conducted in the USA.

There are many possible reasons for why New Zealand’s “Why Start” campaign was not associated with measurable declines in youth smoking prevalence. These include, the lack of sufficient other complementary interventions; the campaign being a relatively low budget one; the campaign themes being ineffective (ie, they were generally not particularly “hard hitting” relative to campaigns used for young people in Florida and other US states (ie, the “truth” campaign); the focus on “health threats” more than “social threats” [Kwai-Choi Lee et al 2003]); and the campaign not being able to compete with possible drivers that were increasing smoking rates (eg, pro-smoking images in movies and other media).

**Comments on implications for New Zealand:** It is plausible that recent declines in youth smoking [Scragg 2006] may partly reflect smoking cessation mass media campaigns aimed at adult smokers, as well as denormalisation from the expansion of public, workplace and home smokefree environments [Thomson et al 2005c; Thomson & Wilson 2006]. There is also supportive evidence for this from Australia [Wakefield et al 2000; White et al 2003]. Therefore the impact of these adult-focused campaigns on youth in New Zealand should be specifically studied. The research question could be “do smoking cessation mass media campaigns focused on adults, also change knowledge, attitudes and behaviours among young New Zealanders?” Studies could include analysis of Quitline data from adolescent callers.

If the New Zealand health sector was to consider future mass media campaigns for youth smoking prevention, it would need to critically examine campaigns used elsewhere. This is because some of these use overseas campaigns have strong anti-tobacco industry themes which may need to be altered for use in New Zealand, where the industry has a much lower public profile (a situ that is probably due partly to restrictions on marketing).

### **3.3 Restricting youth access to tobacco products**

**Background:** Many developed countries have age limits on tobacco sales to youth and undertake varying levels of enforcement of this law. In New Zealand there is a legal minimum purchase age of 18 years for tobacco products. However, survey data indicates that over one-third of the students who smoked had purchased tobacco products from commercial sources in preceding month (most frequently from dairies and service stations) [Darling et al 2005]. The financial scale of this spending is also considerable and was estimated to be over \$18 million in 2002 for those aged 14-16

years. These authors of this study concluded that “current legislation and enforcement is not a sufficient deterrent to ensure retailer compliance with age restrictions.”

**Evidence for effectiveness:** Systematic reviews by the TFCPS have been recently published on interventions to restrict youth access to tobacco products. Out of 28 studies, 13 qualified for inclusion in this review. The Task Force reported that there was “sufficient evidence” for “community mobilization *when combined* with additional interventions (stronger local laws directed at retailers, active enforcement of retailer sales laws, retailer education with reinforcement)”. More specifically, it reported that this combination was “effective in reducing tobacco use among youth (students) by approximately 5.8 percentage points.” Also that the “intervention reduced the sale of tobacco products by retailers to youth making test purchase attempts by approximately 34 percentage points.” However, the TFCPS considered that there was insufficient evidence for the following components when implemented *alone*:

- Laws directed at minors’ purchase, possession, or use of tobacco products.
- Active enforcement of sales laws directed at retailers.
- Retailer education with reinforcement and information on health consequences.
- Retailer education without reinforcement.
- Community education about minors’ access to tobacco products.

An update of a previous Cochrane systematic review was published in 2005 [Stead & Lancaster 2005]. This identified 34 studies but only 14 of these had data from a control group for at least one outcome. The review found that giving retailers information was less effective in reducing illegal sales than active enforcement or multi-component educational strategies, or both. However, “no strategy achieved complete, sustained compliance”. With regard to impact on youth perceptions of access or prevalence of smoking – there was little impact (3 controlled trials).

The authors concluded that while interventions with retailers can lead to large decreases in the number of outlets selling tobacco to youth, few of the communities studied in this review achieved sustained levels of high compliance. This was their explanation for the “limited evidence for an effect of intervention on youth perception of ease of access to tobacco, and on smoking behaviour”.

**New Zealand evidence:** No specific evaluation studies of New Zealand interventions around enforcing age limits were identified in this review. Instead the New Zealand data are limited to cross-sectional survey data. For example, one study found that major changes in cigarette purchasing behaviour by fourth form students occurred between 1992 and 1997 [Laugesen & Scragg 1999a]. This period was a time when there was increased enforcement against underage sales of tobacco. These changes included:

- Self-purchasing of cigarettes decreased by 37% (95% CI: -40, -34) but acquiring cigarettes from other people increased.
- There was decreased purchasing from dairies and supermarkets but increases from other sources such as take-away shops, tobacconists and vending machines.
- Weekly buying by under-aged students increased by 23%, students who were refused a sale increased by 153% and students who had difficulty in buying increased by 324%. The students who had difficulty in buying were less likely to buy weekly than students who did not have difficulty (31% vs 41%).

Since this study there have been no other published Medline-indexed studies of cigarette purchasing by New Zealand students.

**Summary of the evidence:** The TFCPS reported that there was “sufficient evidence” for “community mobilization when combined with additional interventions”. A Cochrane systematic review was more tentative and described the evidence as “limited” for an effect of this intervention on youth perception of ease of access to tobacco, and on smoking behaviour. New Zealand data are very limited but are consistent with some possible benefit on reducing sales to youth.

**Comments on the evidence:** There would seem to be little doubt from the systematic reviews that youth access interventions can reduce sales of tobacco to young people, (but only when adequately enforced). However, there is still uncertainty about whether or not such interventions actually reduce smoking behaviour by youth. This is possibly because young people have many other ways of obtaining tobacco (eg, from parents, older friends or older siblings). Obtaining New Zealand specific evaluation data would probably only worthwhile if the intervention involved was very intensive and was well-designed with a number of control communities.

**Comments on implications for New Zealand:** Further research in this intervention area and further investment in enforcement of the existing law may not be a top priority for tobacco control in New Zealand. This is because:

- The resource costs of these interventions for the health sector are relatively high (unless responsibility for monitoring can be shifted largely to the police). Various tobacco control researchers have also argued against this intervention on resource use efficiency grounds [Fichtenberg & Glantz 2002].
- The task is potentially becoming increasingly difficult as youth become wealthier (owing to general economic conditions). The relatively low legal alcohol purchase age in New Zealand (eg, compared to the USA) may also contribute to the drinking culture among adolescents that overlaps with smoking behaviours (given the evidence for complementarity of these behaviours [Room 2004]).
- There is a possible theoretical downside to such interventions given that a greater focus on limiting access may contribute to enhancing the “forbidden fruit” aspect of smoking and of highlighting smoking as an “adult behaviour”. Indeed, youth access programmes have been described as reinforcing the “tobacco industry’s central marketing message that kids should smoke because it will make them appear more adult” [Fichtenberg & Glantz 2002].

Nevertheless, one general argument for increased levels of enforcement is that it is the duty of the government to enforce the law. However, this goal could still be partially achieved by a relatively low level of enforcement as long as this was accompanied by an occasional well publicised successful prosecution of a retailer (especially if the fines were increased substantially).

### 3.4 School-based education relating to smoking

**Background:** Schools provide a route for communicating with a large proportion of young people, and school-based programmes for smoking prevention have been widely developed internationally. In New Zealand, a survey of secondary schools conducted in 2002 found that 96% provided some education about smoking [Darling & Reeder 2003b]. Schools were an important part of the 2003 amendment of the Smokefree Environments Act (which prohibited smoking in school grounds).

**Evidence for effectiveness (systematic reviews):** A Cochrane systematic review has recently been completed [Thomas & Perera 2006]. This review identified 94 randomised controlled trials (RCTs) of which 23 were classified as being “category one” (“most valid”). The findings can be summarised as follows:

*Social influences interventions:* Of the 13 “category one” studies of social influences interventions, nine found some positive effect of intervention on smoking prevalence, and four failed to detect an effect on smoking prevalence. Of note however, was that the largest and most rigorous study (the Hutchinson Smoking Prevention Project involving an intensive eight-year programme), found no long-term effect on smoking behaviour.

*Combined social influences and social competence interventions:* There were three “category one” RCTs of these studies. A non-significant beneficial effect on short-term smoking prevention was obtained from the pooled estimate (odds ratio = 0.72; 95% CI: 0.45, 1.16). The review also noted that “there was a lack of high quality evidence about the effectiveness of combinations of social influences and social competence approaches.”

*Multi-modal approaches:* There were four category one studies of multi-modal approaches but they provided limited evidence about the effectiveness of multi-modal approaches including community initiatives. The authors of this review concluded that:

“There are well-conducted randomized controlled trials to test the effects of social influences interventions: in half of the group of best quality studies those in the intervention group smoke less than those in the control, but many studies failed to detect an effect of the intervention. There are only three high quality RCTs which test the effectiveness of combinations of social influences and social competence interventions, and four which test multi-modal interventions; half showed significant positive results.”

Another systematic review was published in the year before the Cochrane systematic review (detailed above) was published [Wiehe et al 2005]. It focused on school-based smoking prevention trials with long-term follow-up (ie, followed up at least one year after intervention ended, and that had smoking prevalence as a primary outcome). Out of 177 relevant studies, eight met the selection criteria. These studies differed in intervention intensity, the presence of booster sessions, by length of follow-up periods, and attrition rates. Only one of these studies showed decreased smoking prevalence in the intervention group. The authors concluded that: “few studies have evaluated the long-term impact of school-based smoking prevention programs

rigorously. Among the 8 programs that have follow-up data to age 18 or 12th grade, we found little to no evidence of long-term effectiveness.”

This review has been evaluated by a CRD Reviewer as potentially meeting the CRD quality criteria – but a critique has yet to be published [Centre for Reviews and Dissemination 2006e].

A third systematic review focused on school-based prevention programs in just one country, South Korea [Park 2006]. It included 11 studies and reported that knowledge was the main content of the programmes involved (delivered mainly as didactic presentations). Overall the review reported that these programmes were not very effective and that there were various methodological problems with the studies involved.

***Evidence for effectiveness (other major reviews):*** A review published in 2003 examined adolescent tobacco and other drug use prevention programmes [Skara & Sussman 2003]. Of the 25 studies (11 experimental studies and 14 quasi-experimental studies) considered suitable for examination, all but one of the included studies used a school-based programme. All studies included programmes addressing social influences to smoke and the development of skills to resist the pressure to smoke (other programme elements included life skills training, factual information, public commitment and a community component).

The authors reported that “the majority of these studies reported significant program effects for long-term smoking, alcohol, and marijuana outcomes, while indicating a fairly consistent magnitude of program effects”. They concluded that there was “long-term empirical evidence of the effectiveness of social influences programs in preventing or reducing substance use for up to 15 years after completion of programming.” However, they noted the lack of significant programme effects reported in several studies and “the great variability that existed in the level of internal and external validity across all studies.” More specifically for smoking, 15 of the 25 studies found that programmes had a significant positive effect (ie, less smoking) on at least one smoking outcome (eg, ever, monthly, weekly or daily smoking), compared the with control groups. Of the studies reporting the difference between treatments in the percentage of adolescents smoking, the programmes had a significant positive effect in comparison with the control groups (in 11 of 17 studies).

A CRD critique of this review has been reported [Centre for Reviews and Dissemination 2006b]. This critique considered that “the authors’ conclusions took account of the quality of the included studies and are likely to be reliable.” There were however, some sub-optimal aspects of the review identified in this critique eg, (i) there were no attempts to minimise language bias in the searches; and (ii) the “methods used to select the studies were not described, so it is not known whether any efforts were made to reduce errors and bias”.

***Evidence for effectiveness (other school-based programmes):*** Of possible relevance to school-based smoking prevention programmes are reviews of other health-related programmes in schools. The TFCPS has undertaken systematic reviews of the

following school-based interventions and considered that there is adequate scientific evidence to recommend these:

- Physical education to increase physical activity (“strong evidence of effectiveness”).
- Instructional programmes to reduce riding with alcohol-impaired drivers.

However the TFCPS found *insufficient* evidence for the following school-based interventions:

- Use of peer organisations to reduce alcohol-impaired driving.
- Use of “social norming” campaigns in reducing alcohol-impaired driving.
- Programmes to control overweight or obesity.

Another review reported some success with school-based interventions involving drugs other than tobacco ie, in six out of nine studies there was a significant effect on reducing other drug use [Skara & Sussman 2003].

***New Zealand evidence:*** No published evaluation studies of specific school-based smoking prevention programmes were identified. The impact of the new 2003 smokefree law on smoking on school premises has also not yet been fully evaluated. Nevertheless, one New Zealand survey has reported that 96% of secondary schools have educational programmes on smoking (usually within the Health and Physical Education Curriculum). It reported that “anti-smoking education” was often cited as a sanction for young people caught smoking (43%)” [Darling & Reeder 2003b)]. Specific requirements were having to watch “anti-smoking” videos, copy out “anti-smoking” material, complete assignments on smoking and attend smoking-cessation courses.

Other work by Darling et al examined the various components of school smoking policies that included education programmes, cessation support and punishment for students found smoking [Darling et al 2006b]. They found that these components were not significantly associated with smoking outcomes, health knowledge or health behaviours, and only weakly related to a punishment emphasis and students advising others to not smoke. In particular, they reported that school policies which had a punishment emphasis had an adverse health effect (ie, in terms of students being less likely to advise others not to smoke). The authors concluded: “that having a school tobacco policy was unrelated to the prevalence of tobacco use among students, tobacco purchasing behavior and knowledge of the negative health effects of tobacco.”

***Summary of the evidence:*** There is evidence from a Cochrane systematic review and another major review that some social influences interventions in schools can be an effective in tobacco control. Nevertheless, some of these programmes did not achieve statistically significant outcomes and there is insufficient evidence for particular combinations of school-based interventions. Systematic reviews for other school-based programmes show that some programmes are effective (eg, around physical activity and one aspect of alcohol control) – but there is insufficient evidence for various other programmes. The New Zealand specific evaluation data are limited and school-based interventions are not particularly intensive in this country.

**Comments on the evidence:** A large number of studies on school-based smoking prevention interventions have been undertaken internationally. However, the vast majority of these are not included in systematic reviews owing to deficits in methodological quality. This highlights the need for better quality research and other authors have made specific recommendations for future research [Skara & Sussman 2003]. For example, these authors note the need to use detailed conceptual models to design and analyse studies and to use RCTs or quasi-experimental designs. Of particular relevance to New Zealand is the issue of these evaluations considering the influence of ethnicity on programme effectiveness.

In terms of existing programmes in New Zealand schools, it is of potential concern that some schools link smoking education with punishment for being caught smoking. This occurrence may be suggestive that some schools are not using state-of-the-art approaches to smoking education. It is also of concern that while nearly all schools have some sort of programme (suggesting a considerable investment in staff or community resources), there are no published evaluations.

**Comments on implications for New Zealand:** Given the available evidence, New Zealand could use the findings of the recent Cochrane systematic review to design state-of-the-art social influences interventions to be built into the school curriculum. However, such programmes are probably likely to be more effective if combined with broader programmes such as higher tobacco taxes and more intensive mass media programmes for tobacco control.

Smoking prevention programmes in schools could also be integrated with other school-based programmes which have evidence from systematic reviews for effectiveness eg, instructional programmes to reduce riding with alcohol-impaired drivers.

### **3.5 Media interventions relating to movies and television**

**Background:** A recent review reported that “strong empirical evidence indicates that smoking in movies increases adolescent smoking initiation” [Charlesworth & Glantz 2005]. The evidence in this review came from: content analyses, focus groups, psychological experiments, and epidemiological studies. These “provide a consistent chain of evidence that smoking in the movies leads adolescents to hold more pro-tobacco attitudes and beliefs, which is consistent with the observed dose-response relationship between exposure to smoking in the movies and initiation of adolescent smoking”. Other mechanisms were summarised as follows:

“Movies teach children the same smoking stereotypes (glamour, coolness, attractiveness, sexiness, rebelliousness) and adult motivations (stress relief, celebration, romance) for smoking that pervade tobacco advertising and help establish the perception that smoking is normal, prevalent, and even desirable in society, especially among adults. The images of smoking in movies both normalize the behavior and downplay the negative health effects associated

with smoking, encouraging more tolerant, neutral, or nonchalant attitudes about smoking.”

In New Zealand there have been studies indicating that tobacco use is commonly shown on television including in children’s television [Thomson & Wilson 1998], television and videos [Singh 1995], and in prime time television [Singh & Thomson 1994; McGee & Ketchel 2006]. One study also found that smoking was common in the most popular movies shown in New Zealand [Gale et al 2006].

Qualitative studies in New Zealand also support the international evidence. One study reported that “pervasive and credible smoking scenes in film may offer support and reassurance to older teens who currently smoke or hold ambivalent views about smoking” [McCool et al 2003]. Another reported that “smoking imagery in film may play a role in the development of smoking intentions through inflating the perception of smoking prevalence and presenting socially attractive images” [McCool et al 2005].

The Dunedin longitudinal study found that average weeknight viewing of television between ages 5 and 15 years was associated with increased cigarette smoking ( $p < 0.0001$ ) [Hancox et al 2004]. After adjusting for other factors, it was calculated that in 26-year-olds, 17% of smoking could be attributed to watching television for more than two hours a day during childhood and adolescence.

***Evidence for media interventions:*** No systematic reviews were identified. The most recent and detailed other review was published in 2005 [Charlesworth & Glantz 2005]. This review considered the following five interventions:

1) *Parental restrictions on viewing R-rated movies.* The reviewers considered that this intervention significantly reduced youth exposure to movie smoking and subsequent smoking (based on a prospective observational study [Sargent et al 2004] and another observational study [Sargent et al 2005]).

2) *Changes to movie ratings.* There was no specific evidence reported for this intervention. However, the reviewers noted that the shift of smoking from R-rated movies to PG-13-rated movies that is occurring in the US would reduce the effectiveness that parental R-rated movie restriction would have on adolescent smoking. Therefore, to reverse the effects of the “ratings creep” these reviewers argue for “amending the ratings system to rate movies with smoking as R (as is done with strong language)”. The logic of this action is that “because PG-13-rated films generally make more money than R-rated movies, producers would simply leave tobacco out of movies designed to be marketed to youth audiences, further reducing exposure.”

3) *Disclosure of tobacco-industry involvement by the people making a movie.* There was no specific evidence reported for this intervention but the reviewers reported on the precedent for disclosures that are routinely required of people publishing articles in medical journals.

4) *Ending tobacco brand identification in movies.* The evidence presented in this review indicated that a tobacco industry amendment of its voluntary advertising code did not reduce the frequency of brand appearances in films rated for adult versus adolescent audiences before and after the voluntary ban. The Master Settlement Agreement (MSA) in the US (not a law, but a legally binding contract), was also probably ineffective:

“The number of R-rated films with brand placements released each year did fall after the MSA, but the number of PG-13-rated films with brand display increased. Although these findings may have resulted, at least in part, from the mid-1990s trend to “down-rate” movies from R to PG-13, the fact remains that the level of exposure to tobacco in adolescent-rated movies increased.”

Another weakness of the MSA for reducing brand identification in the media was that it does not apply to payments for product placement by the non-US subsidiaries of the multinational tobacco companies.

5) *Showing antismoking advertisements before movies containing tobacco.* The reviewers considered data from an experimental study in a classroom and from an experiment conducted with the general public in a real theatre. These studies provided evidence that “viewing antismoking advertisements before viewing movie smoking seems to blunt the stimulating effects of movie smoking on adolescent smoking.” Of note however, is that while such interventions may increase disapproval of smoking in non-smoking adolescents, and increase smoker’s intentions to quit – there are no data on impacts around reduced smoking uptake by youth.

Other possible media-related interventions that could potentially reduce tobacco exposure in the media are detailed below. However, no reviews were identified on these with regard to the effectiveness for reducing tobacco exposure or youth uptake of smoking.

- Systematic engagement with television and movie producers to promote voluntary actions to reduce tobacco imagery.
- Interventions to reduce overall television exposure (via parental action, taxation of television airtime, regulations limiting airtime etc).
- Media-literacy programme for young people – to build resistance to tobacco imagery and product placement (see Section 3.4 on school based interventions).
- Parental supervision (for television and/or movies).
- V-Chips on television.
- Internet-filtering-software.
- Restrictions on government direct funding support or subsidies for television and movie production involving tobacco imagery.
- Warning labels on all film/television programme promotional material.

**Summary of the evidence:** The available evidence is limited, but is suggestive that two interventions may be effective in reducing the impact of pro-tobacco imagery in the media: (i) parental restrictions on viewing R-rated movies; and (ii) showing antismoking advertisements before movies containing tobacco. Various other interventions are plausible based on logic (eg, changes to movie ratings) but effectiveness data on actual interventions is limited.

**Comments on the evidence:** New Zealand authors have also argued that “pre-film anti-smoking advertising appears to be the most promising immediate policy” [Gale et al 2006]. Nevertheless, they suggest that “experimental research is required to demonstrate cost effectiveness.” This suggested approach would seem reasonable but needs to be considered in the context of limited tobacco control resources, both for non-government tobacco control advocates and for government.

Gale et al also considered the process of film classification and labelling in the New Zealand context (ie, the Films, Videos, and Publications Classification Act (1993)) [Gale et al 2006]. They concluded that “the process of film classification and labelling as established by this Act has a number of limitations that make classification of films based on smoking an unlikely prospect.” Despite this view, one option for government to consider is to formally restrict funding support for movies and television programmes that contain tobacco imagery (eg, via the Film Commission or by State-owned television channels).

There is a lack of evidence for interventions to reduce overall television exposure as a way of reducing exposure to tobacco imagery among youth (at least based on searches for reviews). Nevertheless, there is some evidence that interventions to reduce television viewing by youth may reduce weight gain and the risk of obesity. Therefore, the health sector may wish to further explore television reduction interventions from a total health perspective (ie, to reduce obesity, tobacco imagery exposure and even unsafe adolescent sexual behaviour).

**Comments on implications for New Zealand:** Experiments to assess the effectiveness of pre-film anti-smoking advertising in the New Zealand context may be warranted. So might experiments to reduce overall television exposure (ie, potentially as part of obesity prevention and educational enhancement interventions). However, the lowest cost options for government are interventions involving changes to movie and television programme ratings, restrictions or disincentives on screening hours for ‘tobacco-heavy’ viewing, and restrictions on government-funding of movies and television programmes that contain tobacco imagery.

### **3.6 Smokefree sponsorship and removing tobacco sponsorship**

**Background:** The nature of sponsorship (a branch of an overall marketing strategy) means that direct evidence of its effectiveness for tobacco control is difficult to detect. This is due to the indirect influence on smoking initiation and quitting. Thus most of the discussion below is about indirect evidence of effectiveness. For a general discussion of sponsorship evaluation, see: [Hoek & Gendall 2001].

Health sponsorship has been used to replace sponsorship by the tobacco industry in a number of countries – particularly Australia and New Zealand. The basis for this intervention is the concern around tobacco sponsorship contributing to youth smoking. For example, a systematic review of relevant tobacco industry internal

documents identified that the “industry utilised six vehicles and themes to construct a tobacco culture in Asia: music, entertainment (including nightclubs, discos, and movies), adventure, sport (including motorsports, soccer, and tennis), glamour (beauty and fashion), and independence” [Knight & Chapman 2004]. Tobacco industry activity in the first five of these areas is largely through sponsorship. The reviewers concluded that “the tobacco industry set about constructing a tobacco culture that sought to make smoking desirable, even normal, for young men and women.” Other reviewers have also described how tobacco industry sponsorship serves as an important marketing tool for the industry [Rosenberg & Siegel 2001].

In New Zealand, the Smoke-free Environments Act 1990 established the Health Sponsorship Council (HSC) to “promote health and healthy lifestyles through the provision of sponsorship or otherwise”. For the period 1991-1995, the HSC replaced tobacco sponsorship with “smokefree” sponsorship in sporting and cultural events (ie, providing funding for events for the opportunity to have “smokefree” branding of associated with these events). Over the last 15 years the HSC has increasingly become a “social marketing” agency in the area of tobacco control, but also other areas of health. The HSC has developed various health brands, some of which relate to tobacco control (eg, the “Smokefree”, “Auahi Kore” and “Lungfish” brands). Through these brands the HSC has aimed to increase the number of smokefree environments and settings with the priority ones being sports events and clubs, arts settings, and marae. The Auahi Kore programme also focuses on increasing the number of smokefree whanau gatherings and Māori-dominated sports events. More recently however, HSC’s activities have shifted to the directions highlighted by the “Reducing Smoking Initiation Framework” [Health Sponsorship Council 2006]. These include: (i) reducing the number of settings in which young people are exposed to smoking behaviour (eg, in and around homes and cars, and public and recreational settings); (ii) reducing media portrayals of tobacco; (iii) increasing young people’s ability to resist tobacco (through a “Youth Programme”); (iv) and reducing inequality in smoking uptake among Māori (through Auahi Kore). Some of these aspects still include smokefree sponsorship, but less so than sponsorship activities in the first decade of the HSC’s operations.

In addition to work by the HSC, the public health services of DHBs and NGOs also contribute to various smokefree sponsorship activities. For example, action by the public health service in Canterbury and the HSC have contributed to sports clubs adopting smokefree policies in the Canterbury region.

Two types of evidence is given below, that for the effectiveness of the removal of tobacco sponsorship, and that for the effectiveness of smokefree sponsorship.

***Evidence for effectiveness:*** The earlier literature supportive of tobacco-related sponsorship interventions is summarised below:

- A review of a ban on tobacco sponsorship linked to tobacco replacement sponsorship involving health promotion in Western Australia [Holman et al 1997]. The reviewers found that the survey data indicated that such replacement sponsorship provided opportunities for environmental modification (eg, permanent smokefree policies), promotion of anti-smoking messages, and targeting of groups that are hard to reach.
- Subsequent survey data from Western Australia has also reported that the use of health sponsorship “increased the prevalence of smoke-free policies in recreational settings, and there was growing support for these policies” [Giles-Corti et al 2001].

More recently, a Cochrane systematic review has considered policy interventions implemented through sporting organisations for promoting healthy behaviour change [Jackson et al 2005]. This review is of relevance, given that smokefree sponsorship is frequently targeted at sporting organisations. The review noted that “sporting organisations provide an important setting for health promotion strategies that involve policies, communication of healthy messages and creation of health promoting environments.” Nevertheless, the review stated that “no rigorous studies were located to test the effectiveness of policy interventions organised through sporting organisations to increase healthy behaviours, attitudes, knowledge or inclusion of health oriented policies within the organisations.” They noted that the search process revealed a number of case studies with anecdotal reporting of outcomes (but no controlled studies). The reviewers “strongly” recommended that rigorous evaluation techniques are employed more commonly in this field.

No other relevant systematic reviews were identified. Yet a few notable study findings are as follows:

- A survey in Victoria Australia reported on sports club policies relating to smoke-free facilities, sun protection, healthy catering, responsible serving of alcohol and sports injury prevention [Dobbinson et al 2006]. It concluded that “policy development for health promotion can be achieved in sports clubs when it is well supported by health agencies and consideration is given to the appropriateness of the specific behaviours to be encouraged for a given sport.”
- Other Australian authors have noted that “there are now a number of documented examples demonstrating that sponsorship can lead to improvements in the health of the sporting environment” [Crisp & Swerissen 2003]. However, they considered that “relatively little is known as to why some sponsorships are more successful in achieving these structural changes than others in ostensibly similar sports.” The authors concluded that structural changes in sporting environments (including smokefree environments) are “difficult to achieve, especially in the absence of a programmatic approach to health promotion.”
- Brand awareness surveys in Australia indicate that sponsorship can increase brand awareness and change attitude to brands [Jalleh et al 2002]. This study found that health sponsorships (including a smoking cessation “Quit” brand) had more impact than the commercial sponsors studied.

- Sports sponsorship outside smokefree issues has been studied in Australia with regard to injury prevention. One study [Jalleh et al 2001] using a quasi-experimental field design found evidence for increased mouth-guard use among junior rugby and basketball players. These authors concluded that “the campaign had a significant and substantial effect on behaviour and provides evidence of the benefits of leveraging a sponsorship to modify the behaviour of the target group.”

Indirect evidence about the effects of removing tobacco industry sponsorship includes that from tobacco industry internal documents on the positive effects of sponsorship for tobacco sales [Anderson et al 2002; Knight & Chapman 2004; Hafez & Ling 2006; MacKenzie et al 2007].

***New Zealand evidence:*** No rigorous evaluation data on New Zealand’s smokefree sponsorship activities was identified in Medline-indexed journals. There are various lines of evidence that are supportive of a public health benefit from such sponsorship, but it is all relatively weak from a scientific perspective. The various strands of evidence are as follows:

*Ending of tobacco sponsorship:* There is no doubt that the 1990 legislation is very largely effective, so that tobacco sponsorship has become rare in New Zealand. Exceptions may include the use of dance parties and other ‘viral marketing’ eg, see: [Darling & Reeder 2004]. Also, of note is that none of the recent sponsorship studies in New Zealand mention tobacco (just food, alcohol and gambling) [Richards et al 2005; Maher et al 2006].

*Denormalisation of tobacco sponsorship and tobacco use:* A historical review has suggested that in the 1990s smokefree sponsorships appeared to improve the public and political acceptability of removing tobacco sponsorship of sports and arts [Thomson & Wilson 1997]. In addition, the removal of tobacco sponsorship may be a factor in the continued decline of the acceptability of smoking in various venues and in homes (see survey data reviewed in: [Thomson et al 2005b; Thomson et al 2005c; Edwards et al 2006a]). However, many factors may account for these changes and so it is not possible to identify the role of smokefree sponsorship.

*Brand awareness and popularity:* There is evidence for relatively high public awareness of HSC’s smokefree brand and to a lesser extent the Auahi Kore brand [McKinlay Douglas Ltd 1997; Potter 2002]. Qualitative research using focus groups and teacher interviews also suggests that smokefree events are popular with students as well as achieving high levels of media penetration [NFO CM Research 2001]. A survey of HSC’s stakeholders also provided “strongly positive feedback” on its service and brands – including specifically the smokefree and Auahi Kore brands [Kia Maia Bicultural Communications 2001].

HSC sponsorship activities also appear to be relatively well targeted towards a Māori audience eg, with the involvement in netball, rugby league, softball etc [Health Sponsorship Council 2002b]. More specifically there has been support for Māori touch rugby, Māori tennis, Māori golf, waka ama and with various Māori performing

arts (eg, Kapa Haka 2002 – the National Aotearoa Traditional Māori Performing Arts Festival).

Recently the HSC has reported that the “Smokefreerockquest is arguably the ‘biggest and most influential nationwide music event in New Zealand’ with approximately 125,000 young people experiencing live performances as part of the 2005 events – a figure representing almost 50% of the targeted age group” [Health Sponsorship Council 2006]. Also the “Smokefree Pacifica Beats 2005 attracted a record 74 bands from 61 schools” from across the country.

For a Māori audience, the HSC recently undertook 26 community-based events / promotional activities over one year “to reinforce Auahi Kore behaviours in community settings where Māori gather e.g. Marae and sporting settings” [Health Sponsorship Council 2006].

*Increasing prevalence of smokefree clubs/facilities/schools:* HSC reports have detailed the extent of smokefree policies in various sports (eg, netball [Health Sponsorship Council 2001], in sports stadiums [Potter 2002] and marae that are now Auahi Kore / smokefree. The HSC has also described playing a role in assisting a major car rental company establishing a smokefree vehicle fleet [Health Sponsorship Council 2002a]. It is possible that such developments may be partly the result of sponsorship links with the various health agencies involved. However, no controlled studies are available and other factors may have been involved.

With regard to smokefree schools, one published New Zealand study has reported that a “smokefree schools grant programme” appeared to have positively influenced policy development toward totally smokefree schools [Heckert & Matthews 2000]. Such actions may have made it easier for policy-makers to adopt a new law (in 2003) that made all school grounds smokefree – but there are no detailed studies of this.

***Summary of the evidence:*** The available evidence for smokefree sponsorship is insufficient from a scientific perspective. Nevertheless, various studies from Australia and the overall pattern of evidence from New Zealand is suggestive of possible benefits around the end of tobacco industry sponsorship and its acceptability, the increase in smokefree policies and the reducing public acceptability of smoking in various settings.

***Comments on the evidence:*** It is clear from the published literature that more evaluation work is needed and that well-designed studies are required in this area. Nevertheless, the limited evidence that is available is suggestive of some benefits being likely – including evidence for benefits in New Zealand.

Of particular note is that the law ending tobacco industry sponsorship in this country and its replacement with HSC smokefree sponsorship has been a success in terms of eliminating such sponsorship, when compared to countries that still allow tobacco industry sponsorship (which occurs at substantive levels eg, in the US [Rosenberg & Siegel 2001]).

The popularity of smokefree sponsorship activities in New Zealand is impressive and obtaining television coverage for smokefree music events means that the reach to the priority audiences is likely to be large. So even if sponsorship is not particularly effective, its high levels of reach may mean that it has important population-level impacts on denormalising smoking.

Some of the activities in the smokefree sponsorship area may have other benefits – such as for increasing physical activity, general interest in school, and for strengthening cultural identity for Māori and Pacific youth. Ideally these issues need to be considered in future evaluation studies.

Another complexity for evaluation is that smokefree sponsorship is sometimes just a component of a wider collaborative activity. For example a recent HSC collaboration with the local authority for Upper Hutt City, helped result in it declaring its parks, reserves and playgrounds permanently smokefree (on World Smokefree Day 2006) [Health Sponsorship Council 2006]. Regional Public Health and several other organisations were involved in implementing and communicating this new policy.

***Comments on implications for New Zealand:*** Given the available evidence and its limitations, it is critical that more evaluation work on smokefree sponsorship is conducted. Controlled studies where intensive smokefree sponsorship is focused on some communities, and not on other “control” communities, are one possible area. In the meantime however, it would probably be prudent to continue with existing sponsorship activities – especially those that are popular with New Zealand youth and which get media coverage. Another area that could be explored is for all government agencies to require that organisations have state-of-the-art smokefree policies (including for outdoor areas) before they can receive government funding. This may stimulate the expansion of smokefree sports areas and smokefree arts events and products (eg, Film Commission and other government agency funding of television and film).

### **3.7 Specific interventions of particular relevance to Māori and Pacific youth**

***Background:*** Māori and Pacific peoples in New Zealand have relatively high smoking rates [Ministry of Health 2006] and tobacco-use contributes to health-inequalities in the New Zealand context [Blakely et al 2006; Wilson et al 2006]. Māori and Pacific peoples are also more likely to suffer from the financial burdens imposed by dependency on tobacco, since their average incomes are below the New Zealand average. Given these issues, there are equity arguments for a particular focus on enhancing tobacco control for both these populations in the New Zealand setting.

Fortunately, available data indicate a decreasing trend in the prevalence of daily smoking by Māori and Pacific youth (actually Year 10 students) from 1999 / 2000 to 2005 (see Table 2 below).

Table 2: Prevalence of daily smoking (%) Year 10 students, by sex and ethnicity, 1999–2005

	1999	2000	2001	2002	2003	2004	2005
<b>Female</b>							
Māori	36.2	37.1	34.3	34.3	34.2	29.1	26.5
Pacific	23.0	19.4	19.5	17.6	18.1	13.2	14.5
<b>Male</b>							
Māori	23.6	24.2	19.1	16.8	19.4	16.2	14.0
Pacific	16.6	16.8	14.3	10.8	12.5	11.8	10.2

Source: Year 10 Smoking Survey (see: [Ministry of Health 2006]).

***New Zealand evidence:*** No published studies on youth smoking prevention interventions among Māori and Pacific youth in New Zealand were identified. The interventions in New Zealand to date appear to have been focused on youth as a whole (eg, tobacco tax increases, mass media campaigns, smokefree schools, and school-based educational interventions). Other New Zealand interventions have focused on adult smokers who are Māori or Pacific (eg, the Aukati Kai Paipa programme; mass media campaigns such as “Its about Whanau”; or culturally-appropriate imagery within the “Every cigarette is doing you damage” campaign). The evaluations of these interventions (when they have been undertaken) have not specifically identified impacts on Māori or Pacific youth. Also, some PhD thesis work on hapu level interventions [Gifford 2003], may be published in the future.

Nevertheless, as detailed in Section 3.6 on smokefree sponsorship, there has been a focus by the Health Sponsorship Council (HSC) on promoting Māori smokefree sports and cultural activities (with an underlying goal of preventing smoking initiation). For example, the HSC recently undertook 26 community-based events / promotional activities over one year “to reinforce Auahi Kore behaviours in community settings where Māori gather e.g. Marae and sporting settings” [Health Sponsorship Council 2006].

HSC activities have also focused on Pacific youth. For example, the “Smokefree Pacifica Beats 2005 attracted a record 74 bands from 61 schools” from across the country [Health Sponsorship Council 2006].

The increasing prevalence of smokefree homes among Māori [Thomson et al 2006], might be expected to impact on youth smoking rates. However, no specific evaluation studies were identified. One publication has however, detailed how a health-promotion programme at an urban marae “served as the impetus for the marae community to take over the running of their own health promotion programme, including a declaration of their marae as a ‘smoke-free’ venue” [Simmons & Voyle 2003].

***Evidence for effectiveness (other indigenous peoples internationally of potential relevance):*** This review focused on Medline-indexed searches concerning interventions for indigenous Australians and for Pacific peoples living outside New Zealand.

There has been a review of tobacco control interventions for indigenous Australians [Ivers 2003]. It reported that a trial of a CD-ROM on tobacco for use with indigenous schoolchildren did not produce conclusive results. However, a qualitative evaluation of the effect of a mainstream advertising campaign on Aboriginal Australians indicated that following the campaign, knowledge about tobacco had increased.

Since this review a study has been published of a multi-component tobacco intervention conducted in six Aboriginal communities in the Northern Territory [Ivers et al 2006]. The intervention included sports sponsorship, health promotion campaigns, training health professionals in the delivery of smoking cessation advice, school education about tobacco, and policy on smoke-free public places. The results indicate significant reductions in tobacco consumption in intervention communities and knowledge of the health effects of tobacco and readiness to quit increased. However, there was no significant change in the prevalence of tobacco use.

There is a lack of international data on smoking prevention interventions for Pacific youth. One publication specifically reported a “lack of culturally and linguistically tailored prevention and control programs, and limited impact of mainstream tobacco control programs for AAPIs [Asian Americans and Pacific Islanders]” in the USA [Lew & Tanjasiri 2003].

Of potential relevance to indigenous populations with strong extended family networks is a Cochrane systematic review that is currently underway [Thomas et al 2003]. It aims to “assess the effectiveness of interventions to help family members strengthen non-smoking attitudes and promote non-smoking by children and other family members by identifying and assessing RCTs that provide training, skills and support to family members to prevent smoking initiation.”

**Summary of the evidence:** The available evidence for specific interventions to reduce smoking initiation among Māori and Pacific youth in New Zealand is insufficient. There are also no clear reasons for why smoking has been declining amongst these youth. International evidence for youth smoking prevalence among indigenous Australians and for other Pacific peoples is also insufficient and may also have limited relevance to New Zealand settings.

**Comments on the evidence:** Although specific evidence is lacking, it is conceivable that all of the tobacco control related interventions for both youth and adults have contributed to the downward trend in youth smoking prevalence by Māori and Pacific youth (see Table 2 above). Nevertheless, many other factors may have contributed including improving education levels and longer stays at school, improved family income levels and better employment prospects, and strengthening of cultural identity (eg, through language, cultural activities and culturally-orientated radio and television).

The decline in recent years in Māori and Pacific youth smoking may also be related to the highlighted media coverage of smokefree policies during 2003 and related media campaigns [Thomson & Wilson 2006]. The experience and example of increased public and school smokefree areas in 2004 may also have been a factor.

The evidence from interventions for indigenous Australians and for other Pacific peoples is also insufficient. Yet even where studies have been undertaken, there are issues around generalisability for Māori and Pacific peoples in New Zealand, given large differences in culture, income levels and lifestyles. Nevertheless, such international work should continue to be monitored regularly by health agencies in New Zealand.

***Comments on implications for New Zealand:*** There is obviously a need for further research on interventions specifically for Māori and Pacific youth and also on the impact of nation-wide level interventions on these youth (eg, tobacco tax, smokefree environments, and mass media campaigns orientated towards Māori and Pacific adults). Health agencies in New Zealand could also give more consideration to the pros and cons of the different approaches of: (i) having specific interventions for both Māori and Pacific youth; (ii) adapting New Zealand-wide youth interventions so that they have stronger Māori and Pacific themes within them; (iii) having a mix of both of these approaches.

Other authors have also made recommendations about youth programmes in New Zealand. Glover et al used focus groups and interviews to investigate Māori, Pacific Islander, New Zealand European and Asian parent attitudes and practices in relation to smoking uptake in children [Glover et al 2006]. These authors reported that “parents believed in the value of a smoke-free lifestyle and wanted to protect their children from smoking.” As a result they suggested that strategies to prevent smoking in children “may include supporting parents to quit, informing them that discouraging children of any age from smoking can be effective, and providing culturally appropriate education and resources to facilitate parent/child communication about smoking.” Aspects of these approaches could potentially be included in mass media campaigns so that there can be maximal reach to the priority audiences.

## 4 Strategies to increase smoking cessation (population level)

### 4.1 Increasing the unit price for tobacco products

**Background:** There is a long history of countries using tobacco tax to raise revenue for government and (more recently) as a tobacco control measure. New Zealand has also used tobacco tax for these purposes [Wilson & Thomson 2005]. This Section considers the evidence for tobacco tax on smoking cessation, while a previous Section (Section 3.1) considers tax from a smoking initiation perspective.

**Evidence for effectiveness:** There is “strong scientific evidence” that increasing the unit price for tobacco products is effective in increasing smoking cessation and in reducing consumption (based on a systematic review by the TFCPS). This finding was from data from 17 qualifying studies and the range of price elasticity estimates were  $-0.27$  to  $-0.76$  (median =  $-0.41$ ). This review identified studies that indicate the effectiveness of price increases in different ethnic groups (eg, whites, African Americans and Hispanics), in low-income populations, and in those with poor education.

Other reviews have also found that tobacco taxation is effective in reducing tobacco consumption eg, one by the World Bank [Jha & Chaloupka 1999]. Another form of this review concluded that: “tax increases are the single most effective intervention to reduce demand for tobacco” [Jha & Chaloupka 2000]. Similarly, a review of tobacco company internal documents also provides evidence: “that price increases lead to significant reductions in overall smoking, increases in smoking cessation, and reductions in smoking prevalence, with relatively large effects on young people” [Chaloupka et al 2002a]. One of the most recent reviews also reiterates that there is “strong evidence” that tobacco tax increases are effective in reducing tobacco use and its consequences [Jha et al 2006].

A recent study has also reported an association between suicide rates and tobacco tax [Yamasaki et al 2005]. It found that in Switzerland, higher taxes on tobacco were significantly correlated with lower male standardized suicide rates. This pattern was also found for alcohol tax. However, a significant relationship with tobacco tax and female suicide rate was not found.

Another study of smoking in Canada has added to the evidence that low-income smokers are more responsive to tobacco higher tobacco prices [Gruber et al 2003]. The experience from New York City concerning a mix of tax and other tobacco control interventions has also been positive [Frieden et al 2005]. “Smoking declined among all age groups, race/ethnicities, and education levels; in both genders; among both US-born and foreign-born persons; and in all 5 boroughs.” This study found that the increased taxation appeared to account for the largest proportion of the decrease in smoking.

**New Zealand evidence:** As detailed in Section 3.1, the New Zealand experience with tobacco tax has recently been reviewed [Wilson & Thomson 2005]. This review found that:

“The New Zealand evidence indicates that increases in tobacco prices are associated with decreases in tobacco consumption in the general population over the long term. This finding comes from multiple studies relating to: tobacco supplies released from bond, supermarket tobacco sales, household tobacco expenditure data, trends in smoking prevalence data, and from data on calls to the Quitline service. For the 1988–1998 period, the overall price elasticity of demand for all smoking households was estimated to be such that a 10% price increase would lower demand by 5% to 8%.”.... “There is evidence from two studies that tobacco price increases reduce tobacco consumption in some low-income groups and one other study indicates that tobacco taxation is likely to be providing overall health benefit to low-income New Zealanders. These findings are broadly consistent with the very large body of scientific evidence from other developed countries.”

A commentary article on the New Zealand experience with smoking-related health inequalities [Wilson et al 2006] has also suggested that tobacco tax was one intervention that was likely to contribute to reducing health inequalities associated with smoking. It also reported on the need for the tax intervention to be used more ethically (eg, tying the tax to funds for smoking cessation support).

**Summary of the evidence:** There is “strong scientific evidence” that increasing the unit price for tobacco products is effective in increasing smoking cessation and in reducing consumption (based on a systematic review by the TFCPS). Other major reviews support this (including one by the World Bank). The New Zealand-specific evidence has been reviewed and it provides support for taxation increases from a wide range of studies.

**Comments on the evidence:** The high and consistent level of evidence for tobacco tax, for a range of groups, makes it one of the tobacco control interventions that is the most evidence-based.

In the New Zealand context there is still scope for further research. Indeed, research on tobacco prices is currently underway by O’Dea et al [Personal Communication, Des O’Dea, University of Otago, Wellington]. This work is examining data from recent Household Economic Surveys of 2001 and 2004 to assess the impact of tobacco prices and the impact of increased affordability of tobacco with rising incomes. It also includes a review of the evidence for the use of tied tobacco taxes for tobacco control. The results of this work are likely to be publicly available in mid/late 2007.

**Comments on implications for New Zealand:** There is sufficient scientific evidence to justify further increasing tobacco tax levels in New Zealand to prompt smoking cessation and reduce tobacco consumption. Other New Zealand health workers have recommended tobacco price rises [Metcalf et al 2006] or at least an end to duty free tobacco [White 2006]. Nevertheless, the case would be further strengthened if there were more specific research data on the following topics:

- What are the barriers within the policy-making process to having tobacco tax increases and having tied tobacco taxes in the New Zealand setting?

- How can tax rises be made so that they stimulate maximal quitting (as opposed to compensatory smoking, switching to cheaper products or just cutting down)? For example, the impact of strengthening smoking cessation activities in the months before pre-announced tax increases needs to be studied.
- How does tobacco tax impact on the very poorest smokers in New Zealand and for Māori smokers? For example: do these populations: quit, cut down, engage in compensatory smoking, or continue to smoke in the same way while paying more? This area may be informed by some work around compensatory smoking and cigarette butts being undertaken by University of Otago (Wellington), researchers (including this author) in 2007.
- To what extent does the availability of loose tobacco undermine the impact of tobacco tax increases and how could this be addressed?
- What is the potential value of simulation modelling around tobacco tax in the New Zealand context (eg, as studied elsewhere: [Levy et al 2005])? This may be fairly feasible given work in 2006 by Public Health Intelligence (Ministry of Health) and Victoria University workers to create a tobacco control model for simulating policy interventions.
- What is the scope for combining tobacco tax increases with alcohol tax increases (see Section 4.2 below)?

#### **4.2 Enhancing alcohol control (regarding impacts on tobacco consumption)**

**Background:** This topic area was included in the scope of this review since it was covered in the previous review [Wilson 2003], and is an area of potential relevance to tobacco control. Many alcohol control interventions are already used in the New Zealand setting to minimise alcohol-related harm. In particular there are various regulations, frequent mass media campaigns and occasional increases in alcohol tax levels occur (eg, to address such problems as “alco-pops”).

**Evidence for effectiveness:** There is evidence from work in the early 1990s for interactions between expenditure on tobacco and alcohol that suggest that taxation of alcohol can reduce tobacco consumption [Jimenez & Labeaga 1994]. More recently, a review of the interaction between smoking and drinking [Room 2004] considered that there was a complementary relationship that existed at physiological, psychological and social levels. “The connection is not only in terms of the risk of initiating the behaviour, but also apparently in terms of the ease or difficulty of cutting down or giving the behaviour up”. Also of note was that this reviewer considered that “the increased enclaving of smoking is now probably pushing the two behaviours towards a closer conjunction”. One implication that this review author suggested was the need to re-examine the “separation that has long existed between the tobacco and alcohol policy communities in public health”.

Specific studies of note from the last 10 years are detailed below:

- One study of US youth, found that the movement away from minimum legal drinking ages of 18 years (up to age 21) reduced teen smoking participation by 3 to 5% [Dee 1999]. It was estimated that teen drinking roughly doubles the

mean probability of smoking participation. Similarly, there was evidence (but more equivocal) that higher cigarette taxes and reductions in teen smoking are associated with a lower prevalence of teen drinking. The latter provide further evidence for the complementarity between smoking and drinking.

- Other work from multiple surveys of older people (aged 51+) in the US indicates that: “(1) there is positive reinforcement effect of past cigarette consumption on current alcohol consumption, (2) smoking bans reduce alcohol consumption” [Picone et al 2004]. In contrast however, was evidence that for this older age group higher cigarette prices were associated with *increased* alcohol consumption. In other words this study found evidence for both complementarity and substitution for tobacco and alcohol. The authors suggested that these different findings may be due to how individuals react differently to changes in prices versus physical restrictions on smoking.
- A study of price elasticities for tobacco in Canada reported that price increases on cigarettes “do not increase, and may actually decrease, consumption of alcohol” [Gruber et al 2003]. The cross-price elasticity was estimated at -0.16 for the effect of cigarette prices on beer consumption when the impact of smuggling was excluded (ie, a 100% increase in the price of tobacco would decrease the sales of beer by 16%). These authors also suggest that smuggling of cigarettes into Canada may have raised consumption of alcohol as well.
- A controlled trial among people in treatment for alcoholism found that those who were also encouraged to quit smoking had better alcohol abstinence rates at 12-months (odds ratio = 1.84, 95% CI: 1.28, 2.92) [Bobo et al 1998].
- A recent study has suggested that urges to smoke reduced when the amount of alcohol consumed is reduced [Cunningham et al 2007].

***New Zealand evidence:*** No specifically relevant New Zealand data were identified. Indeed, the historical record is complicated by excise tax increases for tobacco and alcohol often occurring at the same time or being fairly targeted (eg, the most recent alcohol tax increase being targeted on certain spirits).

In terms of the relationship between smoking and alcohol use in New Zealand, some literature does exist. A study of tertiary students, found that increased AUDIT scores (that indicate hazardous alcohol use behaviours) were associated with smoking tobacco (and cannabis use) after controlling for AUDIT scores at baseline [Kypri et al 2002]. Differences have been found in the associations between Māori and non-Māori with regard to smoking and alcohol consumption [Bramley et al 2006]. This study found that for non-Māori, there was a consistent slight increase in smoking with frequency of drinking ( $p=0.0001$ ). However, for Māori, *both* low and high levels of frequency of drinking were associated with a *lower* proportion of current smokers. Another variation was found by one study, that pregnant women who smoked were less likely to report having consumed alcohol, compared to other pregnant women [McLeod et al 2002].

**Summary of the evidence:** The available evidence for this intervention is insufficient. Nevertheless, there is some evidence that indicates that tobacco and alcohol are generally complementary consumer products. This suggests (and there are some supportive studies) that intensifying alcohol control interventions (including higher alcohol taxes) will also tend to lower tobacco consumption for the population overall.

**Comments on the evidence:** The inter-relationship between smoking and alcohol use is complex and may be somewhat dependent on various cultural factors (eg, such as the drinking culture or “pub culture” in various countries). Indeed, since the new smokefree law of 2003 was enacted in New Zealand, there may have been some de-linkage between smoking and drinking to some extent. For example, there was a decline in self-reported socially cued smoking after the law was introduced [Edwards et al 2006a].

**Comments on implications for New Zealand:** Regardless of the evidence for enhanced alcohol control interventions on tobacco use, the health sector may wish to advocate for enhanced alcohol control on other public health grounds (eg, see the review on the public health benefits of alcohol taxes: [Chaloupka et al 2002b]). Further research in this area would probably be desirable and could involve a historical analysis of Household Economic Survey data and data from the 2006 New Zealand Health Survey (when available). More extensive reviews of the international literature on the interaction of tobacco and alcohol consumption may also be indicated.

### **4.3 Mass media education: General and mixed-theme tobacco education campaigns**

**Background:** Mass media campaigns have been extensively used internationally for tobacco control. They may have advantages in terms of reach – particularly to low-income audiences. This section focuses on tobacco control mass media campaigns that are combined with other interventions and usually cover a variety of themes (eg, smoking hazards, youth, and second-hand smoke). That is, they are not just focused on encouraging adults to quit (see Section 4.4). Other sections focus on campaigns for youth (Section 3.2); campaigns involving cessation contests (Section 4.5), and campaigns for smokefree environments (Section 5.2).

There is a range of approaches used in tobacco control media campaigns, including using health threat and ‘social threat’ messages, and information about tobacco industry behaviour. New Zealand campaigns have usually used health threat themes, although campaigns such as ‘Its about Whanau’ are partly based on social considerations.

**Evidence for effectiveness:** There is “strong scientific evidence” that mass media campaigns combined with other interventions are effective in reducing tobacco use prevalence, in increasing smoking cessation and in reducing consumption of tobacco products (according to a TFCPS systematic review). These “other interventions”

include excise tax increases, community education programmes, and the provision of counselling.

A review discussed in Section 3.2 above is also relevant here [Friend & Levy 2002]. The authors reported that “well-funded and implemented mass-media campaigns targeted at the general population and implemented at the state level, in conjunction with a comprehensive tobacco control program, are associated with reduced smoking rates among both adults and youth.” However, the authors noted that the effect of the media campaigns alone was difficult to disentangle from the effects of concurrently implemented tobacco control measures. Specific findings of note for general population outcomes were:

- Two well-funded and implemented general state-wide media campaigns (California \$0.5 per capita and Massachusetts \$2.0 per capita) plus concurrent coordinated tobacco control programmes reduced smoking rates in the general population (a reduction in net smoking prevalence of 6 to 12%).
- Two smaller state-wide campaigns of shorter duration in less populated areas (Michigan \$0.2 per capita and Oregon \$0.6 per capita) found smaller reductions in smoking (net decline 4% and 5%, respectively).

A CRD critique of this review raised some limitations (see Section 3.2) [Centre for Reviews and Dissemination 2006a]. Despite these, there were still some desirable methodological aspects to the review and the CRD commentators considered that “the evidence presented appears to support the authors’ conclusions.”

Another area, the effect of attitudes to the tobacco industry on cessation, has not been reviewed, but a large multi-country study has produced relevant results. It reported “social and industry denormalization were independently associated with intentions to quit smoking” [Hammond et al 2006b].

There have been evaluations of campaigns run in Australia which are of particular interest from a New Zealand perspective (since New Zealand has adapted some of the specific advertisements). These often cover tobacco-related health hazard themes but with a relatively strong focus on smoking cessation. The findings indicate that these campaigns are effective (see details in Section 4.4).

***New Zealand evidence:*** The multi-theme mass media campaign “Its about Whanau” included information about tobacco hazards, smoking cessation, and cultural aspects of smokefree/Auahi Kore for a Māori audience. This campaign was clearly associated with increased calls to the Quitline by Māori within one hour of each television advertisement used in the campaign being shown [Wilson et al 2005]. Each advertisement in this campaign also stimulated increased Quitline calls by other New Zealanders [Wilson 2004]. Other campaigns in New Zealand have also covered tobacco hazards but had a greater focus on smoking cessation (see Section 4.4). The New Zealand campaigns around SHS hazards are dealt with in Section 5.2.

There is some additional weak evidence that New Zealand smokers respond to new information in the media on tobacco hazards. These include:

- The marked drop in sales of a particular cigarette brand after media publicity of an ESR report on its high toxicity [Fraser & Laugesen 2004].

- A statistically significant increase in calls to the Quitline associated with media publicity on smoking causing blindness [Wilson et al 2002b].

**Summary of the evidence:** There is “strong scientific evidence” that general mass media campaigns, combined with other interventions, are effective in reducing tobacco use prevalence, in increasing smoking cessation and in reducing consumption of tobacco products (according to a TFCPS systematic review). Another major review provides additional support. New Zealand data are also supportive for mixed-theme campaigns, albeit being largely limited to how the audience responds in terms of Quitline calls. There is also evidence from evaluations of Australian campaigns (from which NZ campaigns are largely adapted).

**Comments on the evidence:** While there is some reasonable quality scientific evidence for these types of mass media campaigns being effective, there is also a need for further research. In particular there is a need for studies that disentangle the impact of mass media campaigns from other interventions occurring at the same time.

Another problem with the evaluation of some of the mass media campaigns is that they are often quite short (owing to the cost of a high-intensity campaign of extended duration). This can make it difficult to assess consequent effects on changes in smoking prevalence.

**Comments on implications for New Zealand:** Past (and current) New Zealand campaigns have linked tobacco-related hazard information with encouragement to call the Quitline. The value of such integrated messages is discussed in Section 4.4. Such integrated messages could be used in a future mass media campaign that surrounds the introduction of new graphic warnings on cigarette packs (perhaps targeted to particular regions so that other regions could act as control regions).

The lack of tobacco industry behaviour themes in New Zealand media campaigns may mean that an opportunity for stimulating greater quitting is being missed. Nevertheless, future work on campaign design would have to consider the possibility that in New Zealand the tobacco industry has a relatively low profile compared to other countries where these campaign themes have been used.

Since New Zealand also uses mass media campaigns in other areas of public health (eg, road safety, alcohol misuse, destigmatising mental illness etc), there may also be opportunities to learn from the experience in these other areas. Indeed, annual road safety mass media campaign expenditure is usually several times annual tobacco control mass media campaign expenditure, and some evaluation work has been published. Some road safety television campaign themes have also specifically been for a Māori audience, and therefore their evaluations offer opportunities to learn about ways to reach this priority audience.

#### **4.4 Mass media education: Cessation (quitting and maintenance)**

**Background:** One of the most popular forms of tobacco-related mass media campaigns are those that aim to recruit, inform and motivate smokers to initiate and to maintain smoking cessation efforts. Some of these campaigns are linked to Quitlines and there is separate evidence from a Cochrane systematic review that such Quitlines are effective [Stead et al 2006]. Quitlines are not considered separately in this review, except in Section 4.6 (because key aspects of Quitlines are individual-level, rather than population-level interventions). Nevertheless, other evaluation work in New Zealand also indicates that the Quitline in this country is acceptable to smokers and is effective at achieving cessation [Salmon 2005; The Quit Group 2005; Grigg et al 2006].

**Evidence for effectiveness:** There is “insufficient evidence” to assess the effectiveness of mass media campaigns for smoking cessation according to a systematic review by the TFCPS (based on data to May 2000). This result was attributable to both inconsistent results, and inadequate comparison groups in the nine out of 20 studies that qualified for this review.

A Cochrane systematic review on this topic was started in 2004 [Bala et al 2004], but has not yet been reported.

Despite the lack of recent reviews, there are many recent studies that provide evidence for mass media campaigns orientated towards smoking cessation. Australian studies are of particular relevance, as New Zealand has adapted many of the Australian advertisements for local use (often with only minor differences). Some of these Australian studies are detailed below:

- One study has reported on the impact of advertising of the Australian National Tobacco Campaign [Donovan et al 2003]. Continuous tracking with random cross sectional surveys of the target audience found that “the greater the media weight, the greater the recall and recognition mediated by the message of the advertisement”. The authors also reported that “advertisements with clear figure ground executional formats and those illustrating health effects of smoking have high memorability”.
- Another study of this same campaign found that “the more graphic ‘eye’ advertisement conveying new information about the association between smoking and macular degeneration leading to blindness was more efficient in generating quitline calls than the ‘tar’ advertisement, which reinforced the message of tar in a smoker’s lungs” [Carroll & Rock 2003]. Another finding was that combining the health effects advertisements with a quitline modelling advertisement (showing a smoker phoning a Quitline) tended to increase the efficiency of generating Quitline calls. “Placing advertisements in lower involvement [less engaging] programmes appears to provide greater efficiency in generating Quitline calls than in higher involvement programmes.”
- The likely mechanisms involved in the National Tobacco Campaign (NTC) have also been studied from survey data [Borland & Balmford 2003]. This work suggests that smokers have “increased frequency of negative thoughts about smoking and an increase in quitting related thoughts and actions

following onset of the NTC campaign.” The authors also reported that there was also evidence of sustained increase in cessation activity for a month following onset of the campaign.

- Another study examined the smoking cessation advertisements and calls to a Quitline [Erbas et al 2006]. Data on daily Quitline antismoking advertisements, television target audience rating points (TARPS - a measure for audience exposure of advertisements), and calls to Quitline Victoria were examined. Placement of Quitline advertisements (ie, whether they were shown or not) ( $p < 0.001$ ) and an increase in TARPS ( $p < 0.001$ ) on a given day significantly increased the number of calls made to Quitline.
- A study of another Quitline in Australia, the Australian national Quitline service, has also been performed [Miller et al 2003]. It found that “weekly call volume was strongly related to TARPs and increased further when an advertisement specifically promoting the Quitline was broadcast.”

***New Zealand evidence:*** The first published campaign evaluation in New Zealand identified in the Medline-indexed literature was for the “Levin Smoke-Free Fun Week” which had local paid and unpaid media coverage [Harvey et al 1990]. It reported that 29.1% of Levin smokers attempted to reduce tobacco consumption in response to the campaign. “Of the total smoking sample ( $n = 134$ ), 4.4% quit altogether, 10.4% quit for part of the week, while 12.6% reduced their consumption or changed to low tar cigarettes.” A survey at one year after the campaign found that 8.2% had quit smoking, while 9.7% had reduced their consumption.

More recently, the national-level mass media campaign “Every cigarette is doing you damage” included information about tobacco hazards but was predominantly a smoking cessation campaign (with links to the Quitline number on all advertisements). This campaign was clearly associated with increased calls to the Quitline within one hour of each television advertisement used in the campaign being shown [Wilson 2004]. Māori also responded to this campaign in terms of increased Quitline calls and even to a greater extent than the more multi-themed “Its about Whanau” campaign [Wilson et al 2005]. The “Every cigarette...” campaign was also far more effective in generating calls than two mass media campaigns on second-hand smoke [Wilson 2004]. Some individual advertisements were also more effective than others at generating Quitline calls (at a statistically significant level).

A recent mass media campaign for a Pacific peoples audience has recently commenced [St John & Tasi-Mulitalo 2006]. This appears to have been associated with an increased proportion callers who were Pacific people being registered with the Quitline during 2006 (but these data have not been analysed statistically).

Calls to the Quitline are also influenced by unpaid media publicity. For example, increased by media reports about smoking-caused blindness [Wilson et al 2002b], and decreased by overseas disasters [Wilson et al 2002a].

Other tobacco-related mass media campaigns are discussed in other Sections (see Sections 3.2, 4.3, 4.5, 5.2).

**Summary of the evidence:** There is “insufficient evidence” to assess the effectiveness of mass media campaigns for smoking cessation (according to a systematic review by the TFCPS). However, since the TFCPS review (which used data to May 2000) there has been published some evaluation work suggestive of beneficial impacts (with many of the Australian studies having potential relevance for New Zealand given the similarity of campaign content). Also the New Zealand experience strongly indicates that mass media campaigns can increase calls to the Quitline.

**Comments on the evidence:** There is a need for an updated systematic review to assess the recent evidence. Also the “insufficient evidence” for these types of campaigns reported by the TFCPS needs to be considered in the context of:

- There being “strong scientific evidence” for other types of tobacco-related mass media campaigns (see Sections 3.2 and 4.4).
- The fairly compelling New Zealand evidence concerning calls to the Quitline within one hour of advertisements being shown on television.
- The evidence for the effectiveness of smoking cessation mass media campaigns in Australia – many of which use similar advertisements to those used in New Zealand.

**Comments on implications for New Zealand:** Given the local evidence and the Australian evidence, it would seem that health agencies in New Zealand are fairly justified in continuing with mass media campaigns that promote smoking cessation. Indeed, various improvements could be considered, such as the following:

- Enhancing mass media campaign funding for smoking cessation around times of increased societal interest in quitting eg, when there are new laws or when new graphic warnings are introduced (as recommended in: [Edwards et al 2006a]).
- Timing increased mass media campaign advertising to coincide with the annual tobacco tax indexation increase, if this resulted in price changes of sufficient size to register with smokers (ideally if both occurred on World Smokefree Day).
- Further expanding the use of media that is particularly appropriate for reaching Māori (eg, “Māori Television”) and Pacific peoples (given high smoking prevalence rates and therefore health equity concerns).

In all future campaigns it is desirable that all key variables are varied during the campaign so that maximal evaluation information is obtained (eg, varying media weight, and advertisement type/content). There is also increased scope for mass media campaigns to be run at different times in different regions of New Zealand (allowing for control regions to be studied).

The crucial role of these mass media campaigns in attracting calls to the major New Zealand Government funded cessation effort (the Quitline) means that even wider research may be necessary. This could include modelling to identify the long-term smoking cessation responses to large increases in mass media campaign funding.

#### 4.5 Mass media education: Cessation contests

**Background:** Cessation contests are short-duration events in the community that use mass media as the major form of promotion. They are also known as “Quit and Win” contests and they have been widely used as a population-based smoking cessation intervention at local, national and international levels. Since 1994 an international contest has been held every two years in as many as 80 countries [Hey & Perera 2005b].

**Evidence for effectiveness:** There is “insufficient evidence” to assess the effectiveness of cessation contests in increasing smoking cessation according to a systematic review by the TFCPS (but based on data to May 2000). This result was because of the small number of available studies of adequate quality (only one out of 17 studies qualified for this review).

More recently a Cochrane systematic review considered “Quit and Win” contests for smoking cessation [Hey & Perera 2005b]. Four studies met the review’s inclusion criteria and of these, three demonstrated significantly higher quit rates (8% to 20%) for the Quit and Win group (compared to the control group at the 12-month assessment). Despite this, “the population impact measure, where available, suggests that the effect of contests on community prevalence of smoking is small, with fewer than one in 500 smokers quitting because of the contest”. Another problem noted with this intervention was that levels of deception by continuing smokers were high (when these were quantified).

Another Cochrane systematic review has looked at the related interventions of “competitions and incentives for smoking cessation” [Hey & Perera 2005a]. A total of 15 studies met the review’s inclusion criteria. However, none of the studies demonstrated significantly higher quit rates for the incentives group than for the control group beyond the six-month assessment. The authors reported that early success tended to dissipate when the rewards are no longer offered. Nevertheless, this review reported that “recruitment rates can be improved by rewarding participation, which may be expected to deliver higher absolute numbers of successful quitters.”

**New Zealand evidence:** The evaluation of one such contest in New Zealand was favourable with 40% of participants reporting having quit smoking at 12 months follow-up [Lambert 2001][Unpublished HSC data provided to the Ministry of Health 2001]. A disproportionately high number of contest participants were Māori (32% compared to 22% of the total Hawkes Bay population).

In 2002, a number of other such contests were started around the central North Island and these appear to have recruited entrants in excess of the average international participation rate [Quit Group 2002]. Data indicated that short-term quit rates were relatively high – including for Māori women (ie, 31% at 1-2 weeks post-competition for Māori women aged 25-44 years) [Milne 2002]. Factors associated with higher quit rates were the use of NRT and where the person identified that the nominated support person was “important”. Furthermore, the contests attracted a large amount of favourable print media publicity [Unpublished HSC reports supplied to the Ministry of Health].

**Summary of the evidence:** A systematic review by the TFCPS indicating “insufficient evidence” has been superseded by two Cochrane systematic reviews. One found evidence favouring “Quit and Win” contests, but another found insufficient evidence for a broader category of “competitions and incentives”. The New Zealand evidence is very limited but is supportive of a benefit from Quit and Win contests.

**Comments on the evidence:** Quit and Win contests for smoking cessation can have a number of favourable aspects including:

- They can generate unpaid media publicity and the costs can be lowered in various ways (eg, if various sponsors put up the prizes).
- They may particularly appeal to low-income populations.
- They can be run at a community level (as well as a regional and national level).

Nevertheless, the small population impact suggested by a Cochrane systematic review is of concern, as are the reported problems with deception.

**Comments on implications for New Zealand:** Given the issues detailed above, it may be that further work on Quit and Win contests may not be the highest priority for advancing tobacco control in New Zealand. Nevertheless, if such interventions are undertaken, they should be very well designed to allow for rigorous evaluation. One refinement, to help deal with the issue of post-competition relapse, is to continue with further competitions and rewards for quitters who continue to be smokefree for additional time periods.

Given concerns around the problem gambling issue in New Zealand, any use of Quit and Win contests would need to be carefully managed. That is, health workers may need to be prepared to explain to the media how a smoking cessation contest is quite different from the promotion of gambling. This is because entering the contest is free and hence does not financially disadvantaging contestants. Also, the contest is a one-off event, and the outcome has potentially large health benefits for the individual and their family. There may also be some ethical justification for returning some revenue to smokers (in the form of prizes) given the large amount of tobacco tax paid by smokers relative to total government expenditure on tobacco control.

#### **4.6 Specific smoking cessation interventions of particular relevance to Māori and Pacific peoples**

**Background:** As detailed in Section 3.7, Māori and Pacific peoples in New Zealand have relatively high smoking rates [Ministry of Health 2006] and tobacco-use contributes to health-inequalities in the New Zealand context [Blakely et al 2006; Wilson et al 2006]. Māori and Pacific peoples are also more likely to suffer from the financial burdens imposed by dependency on tobacco, since their average incomes are below the New Zealand average. Given these issues, there are equity arguments for a particular focus on enhancing population-level tobacco control for both these populations in the New Zealand setting.

***New Zealand evidence:*** Historically New Zealand tobacco control interventions that promote smoking cessation have been focused on the whole population (eg, tobacco tax, mass media campaigns, and smokefree environments). More recently, however, there have been interventions that are more orientated towards Māori and Pacific audiences.

***Mass media campaigns for smoking cessation:*** Evaluation work around the “Its about Whanau” campaign has indicated that this culturally appropriate campaign was regarded as acceptable to a Māori audience [Barnes & McPherson 2003; Waa & Grigg 2003]. The data on calls by Māori to the Quitline within one hour of these advertisements being shown also indicate campaign effectiveness [Wilson et al 2005].

Māori also responded by calling the Quitline in response to the “Every cigarette...” campaign [Wilson et al 2005]. However, it is unclear what specific elements in this less culturally targeted campaign are effective for Māori (eg, the threat appeal content, the imagery that is orientated towards a Māori audience, or both). Even second-hand smoke mass media campaigns seem to stimulate Māori smokers to call the Quitline (with the “World Smokefree Day” campaign being significantly more effective than the “Lets Clear the Air” Campaign) [Wilson et al 2005].

There is also evidence from calls to the Quitline by Pacific people that these respondents are still influenced by mass media campaigns that have fairly minimal Pacific imagery [Wilson 2004]. A recently launched mass media campaign smoking cessation campaign with a Pacific focus [St John & Tasi-Mulitalo 2006] appears to have been associated with an increased proportion callers who were Pacific people being registered with the Quitline during 2006 (but these data have not been analysed statistically). Nevertheless, Pacific smokers are still under-represented in terms of calls to the Quitline and also in terms of being sent “Quitcards” (NRT vouchers) [Wilson et al 2007].

***Quitline service:*** The national free-phone Quitline service has some culturally-orientated components including Māori and Pacific “quit coaches” who can speak (respectively) Te Reo and some Pacific languages. It appears that the Quitline service has been successful in engaging with Māori smokers in terms of caller levels and acceptability to Māori [The Quit Group 2005].

A recent analysis using 2005/2006 data indicated that Māori callers to the Quitline were having Quitcards (NRT vouchers) being dispensed to them at the rate expected based on the proportion of smokers in New Zealand who are Māori [Wilson et al 2007]. Despite this, one study using 2002/03 data found a lower voucher redemption rate (for one or more vouchers) of 76% of Māori versus 87% of non-Māori ( $p < 0.001$ ) [Salmon 2005]. Nevertheless, this study also found that six-month self-reported quit rates were similar for Māori and non-Māori (ie, 17% versus 22%, a non-significant difference using intention-to-treat analysis). It also reported that for Māori, NRT redemption was associated with increased quitting at six-months: odds ratio = 1.78 (95% CI: 1.00, 3.16).

The most recent evaluation study of the Quitline reported similarly positive reports from Māori and non-Māori of Quitline service experiences [Grigg et al 2006]. Also,

there was no significant difference in the ratings of Quit Advisors provided by Māori and non-Māori respondents. Māori (at 25%) were more likely than non-Māori (at 18%) to have had four or more conversations with Advisors but this difference was not statistically significant. Also of note was that Māori had significantly higher levels of awareness of the “Its about Whanau” campaign (93% compared to 84% of non-Māori). This study did not have enough Pacific respondents to analyse the response of these Quitline users.

*Other smoking cessation services (with population-level elements):* An evaluation of the Aukati Kai Paipa smoking cessation services for Māori women found it to be acceptable and effective [BRC 2003]. Since this evaluation was published in 2003, the services have expanded and evolved, but no subsequent evaluation work was identified in the literature.

An evaluation of a “Quit and Win” contest in the Hawkes bay reported that a disproportionately high number of contest participants were Māori (32% compared to 22% of the total Hawkes Bay population) (see Section 4.5).

There has been a RCT of bupropion (a smoking cessation pharmaceutical) for Māori smokers which has reported successful smoking cessation outcomes [Holt et al 2005]. However, bupropion has not been promoted in any mass media campaigns and has apparently not been incorporated into any routine smoking cessation programmes. This is also the case with nortriptyline (a pharmaceutical with similar efficacy) and for which cost-barriers are less than for bupropion.

The Heart Foundation has a “Pacific Islands Heartbeat Programme” that provides smoking cessation services including: (i) training and support in brief intervention approaches for health professionals and community health workers in the Pacific and mainstream settings; and (ii) nationwide smoking cessation training with training facilitators based in Auckland and Wellington (Pacific Smokefree Services: <http://www.pacificheart.org.nz/index.asp?pageID=2145826786>). It has reportedly trained over 150 smokefree community advocates and about 400 quit smoking counsellors [King 2007]. There is also work done on promoting smokefree Pacific environments in conjunction with Health Promoting Churches and the Healthy Heart Award. There are 11 churches and one community group involved in the Health Promoting Churches Project to date (<http://www.pacificheart.org.nz/index.asp?PageID=2145826783>). Some of these activities are fairly new and so it is not surprising that no published evaluation data were identified.

*Tobacco tax:* There are some New Zealand data that are suggestive of tobacco tax having a disproportionate benefit for low-income groups and for Māori compared to other New Zealanders [Darroch 1999; Thomson G et al 2000]. Other New Zealand modelling work provides additional justification for tobacco taxation, as it indicates that the harm from smoking for low-income New Zealanders (which are disproportionately Māori) greatly exceeds the likely harm for that group (as a group) from financial hardship that is associated with the tax [Wilson et al 2004].

*Impact of smokefree sponsorship and smokefree environments on smoking cessation:* As detailed in Section 3.6 on smokefree sponsorship, there has been a focus by the Health Sponsorship Council (HSC) on promoting Māori smokefree sports and cultural activities. For example, the HSC recently undertook 26 community-based events / promotional activities over one year “to reinforce Auahi Kore behaviours in community settings where Māori gather e.g. Marae and sporting settings” [Health Sponsorship Council 2006]. However, the impact of these interventions on smoking cessation amongst Māori has not been reported in the literature.

The increasing prevalence of smokefree homes among Māori and Pacific people in New Zealand and the increased prevalence of smokefree marae in this country might be expected to impact on smoking cessation. This is because there was an increase in calls by Māori to the Quitline in response to the recent smokefree laws for bars and restaurants [Edwards et al 2006a]. But again, there have been no specific studies published on the impact of smokefree homes and marae for smoking cessation among Māori and Pacific peoples.

As detailed in Section 3.7, there is documentation of how a health-promotion programme at an urban marae “served as the impetus for the marae community to take over the running of their own health promotion programme, including a declaration of their marae as a ‘smoke-free’ venue” [Simmons & Voyle 2003]. However, smoking cessation outcome data for this population has not been published.

***Evidence for effectiveness (other indigenous peoples internationally of potential relevance):*** A review of smoking cessation in US ethnic populations has been published [Lawrence et al 2003]. It identified 36 studies that met the preset inclusion criteria. However, outcome rates were not reported for Native Hawaiian or “Other Pacific Islanders” in any of the interventions they reviewed. Also, this review found that “a relatively small percentage of studies that were randomized trials reported statistically significant findings, and most used intervention strategies that do not reflect the current state-of-the-art.” The authors concluded that more research is needed to identify successful smoking cessation interventions in these populations.

A CRD critique of this review by Lawrence et al has been undertaken [Centre for Reviews and Dissemination 2006d]. It found that this review “lacked methodological detail and failed to present its findings clearly, either by specific ethnic group or by intervention component(s).” Nevertheless, it concluded that overall the review “appeared well conducted”.

The rest of this subsection is focused on literature from Medline-indexed searches concerning smoking cessation interventions for indigenous Australians and for Pacific peoples living outside New Zealand.

*Interventions for indigenous Australians:* As detailed in Section 3.7, there has been a review of tobacco control interventions for indigenous Australians [Ivers 2003]. Although none of the studies reviewed included smoking cessation as an outcome, one study found that training health professionals in delivering a brief smoking cessation intervention resulted in some changes to practice. Also, the impact of a mainstream advertising campaign on Aboriginal Australians indicated that following

the campaign, knowledge about tobacco had increased. A CRD critique of this review is underway but has not yet been completed [Centre for Reviews and Dissemination 2006c].

The multi-component tobacco intervention conducted in six Aboriginal communities [Ivers et al 2006] was also described previously (Section 3.7). The intervention included components that could impact on smoking cessation (including health promotion campaigns, training health professionals in the delivery of smoking cessation advice, and policy on smoke-free public places). The results indicate significant reductions in tobacco consumption in intervention communities and knowledge of the health effects of tobacco and readiness to quit increased. However, there was no significant change in the prevalence of tobacco use for this population. In another article, the lead author of this study has considered the limitation of using evidence from systematic reviews in other populations for designing smoking cessation interventions for Aboriginal people [Ivers 2004].

*Smoking cessation interventions for Pacific peoples:* The lack of relevant studies for tobacco control among Pacific peoples outside New Zealand (eg, [Lew & Tanjasiri 2003]) was mentioned in Section 3.7. One study of Asian Pacific Islander community-based organisations and tobacco control advocacy was identified [Tanjasiri 2001]. It found that only 26% of informants perceived their agencies were active in tobacco control advocacy. Also the staff at these organisations were reported to face many barriers to tobacco control advocacy work.

Among Pacific peoples the kava ceremony has been reported to facilitate smoking cessation in Fiji [Groth-Marnat et al 1996]. Also kava has been suggested as a possible tobacco alternative in Tonga [Finau et al 1982]. There is also evidence from a Cochrane systematic review that kava may be effective in reducing anxiety [Pittler & Ernst 2003]. Nevertheless, more recent findings from three controlled trials do not support the use of kava in “generalized anxiety disorder” [Connor et al 2006]. There is also evidence for some adverse effects from kava use in indigenous people [Clough et al 2003].

***Summary of the evidence:*** The available evidence is suggestive that mass media campaigns for smoking cessation are effective in stimulating Māori and Pacific smokers in calling the Quitline. There is also evidence for the Quitline service and Aukati Kai Paipa services being effective for smoking cessation for Māori. But for other interventions (eg, smokefree sponsorship for Māori sports/culture and Pacific smoking cessation programmes) the evidence is insufficient. The evidence from interventions for indigenous Australians and Pacific peoples outside New Zealand is also insufficient and may be of limited relevance for New Zealand.

***Comments on the evidence:*** There is obviously a need for more evaluation work of smoking cessation interventions for Māori and Pacific peoples in New Zealand. Updating the evaluation of the Aukati Kai Paipa services may be a particular priority – given how these services have developed since the previous evaluation. Also at some appropriate time it will be highly desirable that evaluation data on the Pacific smoking cessation programmes in Auckland are published along with the response of

Pacific peoples to the recent Pacific-orientated mass media campaign promoting calls to the Quitline.

Although there are many limitations with the international literature on smoking cessation among indigenous peoples, further reviews of this literature may be of value (eg, for indigenous peoples in Canada). Also of note is that some of the international literature on improving reach of interventions to low-income communities may also be of relevance to indigenous peoples. For example, there is also work from other countries indicating that nicotine patch promotion can reach and promote quitting in low-income communities [Warner et al 2007].

***Comments on implications for New Zealand:*** There are strong health equity arguments for both increasing population-level smoking cessation interventions for Māori and Pacific peoples and for strengthening the whole tobacco control programme in New Zealand. In terms of specific actions, some of the following could be explored by health agencies in New Zealand:

- 1) Undertaking further evaluation work of existing interventions (as detailed directly above).
- 2) Undertaking review work on the historical role of church-support for public health interventions in New Zealand (eg, for promoting immunisation and for specific campaigns against meningococcal disease).
- 3) Further strengthening the smoking cessation mass media campaigns for Māori and Pacific audiences (eg, in terms of media weight, range of advertisements and campaign turnover etc).
- 4) Giving consideration to workplace smoking cessation interventions in areas with high populations of Māori and Pacific peoples. One recent systematic review of smoking cessation in the work environment found that “resources at work and social support were positively associated with cessation and negatively associated with relapse and the amount smoked” [Albertsen et al 2006].
- 5) Further strengthening aspects of the Quitline service in terms of engagement with Pacific smokers (given that these smokers are currently under-represented as users of this service). There is some international evidence for the idea of building long-term relationships with smokers and recruiting them as volunteers to promote smoking cessation services [Hastings & McLean 2006]. This approach has yet to be tested with the Quitline in New Zealand.
- 6) As discussed in Section 4.5, the importance of mass media spending in encouraging Māori and Pacific audiences to call Quitlines means that even wider research may be necessary. This could include modelling to identify the long-term cessation responses for Māori and Pacific audiences, to large increases in such mass media campaign funding.

## 5 Reducing exposure to second-hand smoke (population-level)

### 5.1 Enhanced public and workplace smokefree area regulations

**Background:** The most substantial recent review has been a Surgeon General's report [U.S. Department of Health and Human Services 2006]. It states that "secondhand smoke causes premature death and disease in children and in adults who do not smoke." Furthermore, it outlines the main solution:

"Eliminating smoking in indoor spaces fully protects nonsmokers from exposure to secondhand smoke. Separating smokers from nonsmokers, cleaning the air, and ventilating buildings cannot eliminate exposures of nonsmokers to secondhand smoke."

A review of the relevant New Zealand studies on the SHS hazard in the workplace reported that there was evidence for this hazard being of public health importance [Wilson & Thomson 2002]. Since this time a very large cohort study from New Zealand has added to the evidence that SHS exposure increases mortality risk [Hill et al 2004; Hill et al 2007].

The New Zealand data on SHS has also expanded with surveys before and after the new smokefree law (reviewed in: [Edwards et al 2006a]). There are also self-reported survey data on smoking in homes and cars [Gillespie et al 2005], observation data on smoking in cars [Martin et al 2006], and air quality data on smoking in cars [Edwards et al 2006b].

It should be noted that there are downstream benefits from smokefree public and workplaces, in reduced smoking initiation, reduced tobacco consumption per smoker, and increased quitting [Brownson et al 2002; Moher et al 2005]. Another issue is that there is not necessarily a sharp distinction in 'interior' and 'exterior' exposure to SHS in some settings, due to the tobacco smoke dispersal through doorways and windows, and through air conditioning systems.

**Evidence for effectiveness – workplace interior restrictions:** The key new review was the US Surgeon General's Report [U.S. Department of Health and Human Services 2006]. Its main findings on non-voluntary SHS control included:

- "Workplace smoking restrictions are effective in reducing secondhand smoke exposure."
- "Workplace smoking restrictions lead to less smoking among covered workers."
- "Establishing smoke-free workplaces is the only effective way to ensure that secondhand smoke exposure does not occur in the workplace."
- "Total bans on indoor smoking in hospitals, restaurants, bars, and offices substantially reduce secondhand smoke exposure, up to several orders of magnitude with incomplete compliance, and with full compliance, exposures are eliminated."
- "Exposures of nonsmokers to secondhand smoke cannot be controlled by air cleaning or mechanical air exchange."

The systematic review by the TFCPS has also reported “strong scientific evidence” that smoking bans and restrictions reduce exposure to SHS in the workplace. This review also concluded that such interventions appear to have an effect on tobacco consumption and cessation. A Cochrane systematic review of 11 trials also found that regulatory interventions to reduce smoking in public places are effective [Serra et al 2000].

One more recent review attempted to quantify the benefits of smokefree restrictions [Levy & Friend 2003]. It reported that:

“Comprehensive public clean air laws have the potential to reduce prevalence and consumption rates of the entire population (including non-working and non-indoor working smokers) by about 10%. Studies on private worksite regulations also suggest that strong worksite restrictions have the potential to reduce the prevalence rate of the entire population by about 6% over the long-term and the quantity smoked by continuing smokers by 28%, depending on the length of time after the ban.

The recent Ministry-commissioned review of New Zealand smokefree public and workplace experience [Edwards et al 2006a] also documents a number of recent international studies showing SHS exposure reductions and even measurable health benefits from smoking restrictions. This review provides some evidence of the “leakage” effect of outdoor smoking affecting indoor SHS levels in a hospitality venue.

**Evidence – outdoor smoking restrictions:** Some countries (like New Zealand) restrict outdoor smoking in school grounds (eg, Finland [Wold et al 2004]). In various US cities and states there are restrictions on smoking in parks (eg, [Henriques et al 2003]), beaches and within specific distances of public buildings (eg, 20 feet in California [<http://www.ucop.edu/ucophome/coordrev/policy/12-03-03.html>] Washington State and Hawaii, USA). Some US states, such as Idaho, have limits on smoking outside schools, and many US universities have such policies.

A Medline search relating to smoking in parks, beaches, bus stops, hospital grounds, university campuses and outside public buildings only identified one evaluation study. It reported a statistically significant decline in observed outdoor smoking in a new smokefree zone around a hospital (compared to the control hospital) [Nagle et al 1996].

The outdoor smoking areas in licensed premises in Queensland (Australia) have relatively tight restrictions associated with them. They are limited to 50% of the total outdoor area, can only be visited by staff to clear glasses and empty ashtrays, are required to have a buffer zone around them, and food consumption and provision of entertainment such as TVs and pool tables within them is forbidden [Queensland Health 2006 <http://www.health.qld.gov.au/atods/tobaccolaws/eating/dosa.asp>]. There are also requirements in some states for venue operators to prevent smoke drift from smoking areas into non-smoking areas or premises [Risely 2005]. However, no

evaluation studies of these particular restrictions in Australian settings were identified in Medline and Google Scholar searches.

**Evidence – smoking in cars restrictions:** A number of jurisdictions have introduced restrictions on smoking in cars where children are present (including Puerto Rico, Arkansas, Louisiana, the city of Bangor (Maine, USA), and South Australia). However, no evaluation studies of these new laws were identified in Medline and Google Scholar searches. This is perhaps not surprising, given that the first of such laws was only introduced in 2006.

**New Zealand evidence:** The Ministry of Health commissioned a review that reported on the impact of the new smokefree law of 2003. Based on multiple surveys and air quality studies it found evidence for reductions (but not always eliminations) in SHS exposure in workplace and hospitality settings [Edwards et al 2006a]. Other studies and reports also support this law having a positive impact from a public health perspective [Asthma and Respiratory Foundation of New Zealand 2005; UMR Research Ltd 2005; Thomson & Wilson 2006]. Comparisons between New Zealand air quality in indoor hospitality settings and those in 31 other countries also provide evidence for the benefit of SHS restrictions in these settings [Travers et al 2007]. That is New Zealand (along with Ireland) had the best air quality out of these countries.

New Zealand has relatively few outdoor smoking restrictions eg, Council-owned parks in South Taranaki and Upper Hutt, hospital grounds, school premises and the grounds of at least one university's campuses (Massey). Victoria University does not permit outside smoking that is: "within three metres of an external entrance or air intake duct to an air handling system". However, no evaluation studies of these various restrictions were identified (but anecdotal media reports and anecdotal observations of smokers and cigarette butts indicate frequent violations of the smokefree grounds of Wellington Hospital). No studies were identified relating to smokefree taxis or smokefree work vehicles in the New Zealand setting.

**Summary of the evidence:** There is strong scientific evidence for workplace smoking restrictions (a TFCPS review, a Cochrane systematic review, a Surgeon General's Report, and other reviews). There is also strong New Zealand-specific evidence. Yet the evidence is still limited concerning enhancements for outdoor smokefree areas (bus stops, parks, beaches, hospital grounds, university campuses and set distances from buildings). There is at present insufficient evidence for laws for smokefree cars where children are present.

**Comments on the evidence:** The New Zealand evidence appears to be fully consistent with the international evidence that workplace restrictions on smoking are an effective tobacco control intervention. Despite the limited evidence for restrictions on outdoor smoking it is quite plausible that such laws can have an impact in countries where there is already high compliance with restrictions in place for workplaces and public transport.

Specific issues for which the evidence could be clarified include the following:

- What (if any) are the adverse health effects from SHS for hospitality industry workers who service semi-enclosed “outdoor” smoking areas?
- What are the impacts on indoor workers who are exposed to SHS that is blown indoors (potentially creating health risks and nuisance impacts)?
- What are the impacts of restrictions on outdoor smoking on the further denormalisation of smoking in society (which is potentially relevant to youth smoking initiation risk)?
- What are the impacts of restrictions on smoking around buildings on the interior levels of SHS?
- To what extent (if any) do New Zealanders comply with existing smokefree outdoor area restrictions (in parks and hospital grounds)?

Evidence that is potentially relevant to arguments around laws for restricting smoking inside cars includes that around child safety seat laws and seat belt laws. A systematic review by the TFCPS found “strong” evidence that child safety seat laws are effective (despite wide variation in enforcement procedures and penalties within US states). It also reported “sufficient” evidence for the effectiveness of “community-wide information and enhanced enforcement campaigns to increase child safety seat use”. The systematic review by the TFCPS on the “effectiveness of enhanced enforcement programs to increase the use of safety belts” reported “strong” evidence for this intervention. The evidence for primary safety belt laws over secondary laws was also reported as “strong”. (Primary laws allow police to stop motorists solely for being unbelted while secondary safety belt laws permit police to ticket unbelted motorists only if they are stopped for other reasons such as speeding).

Despite this related evidence, there is a need for more specific evidence relating to smoking in cars. Possible research priorities include:

- What is the impact of those laws on smoking in cars that have already been passed by overseas jurisdictions?
- What might be the benefits in terms of vehicle crash prevention (given some evidence that smokers have higher crash rates)?
- What lessons are there from mobile phone use in cars and crash risk – for smoking in cars and crash risk (ie, laboratory studies, epidemiological studies, and law intervention studies)?

***Comments on implications for New Zealand:*** The New Zealand health sector could explore some of the research issues detailed above. It could also continue to evaluate international experience on outdoor smoking restrictions and on laws that restrict smoking in cars. Experience with the latter is likely to grow – especially if large US states such as California enact such a law and put resources into evaluation efforts.

## **5.2 Community education to reduce exposure to SHS in the home and in cars**

***Background:*** The consequences for children who are exposed to second-hand smoke (SHS) have been extensively documented and include “an increased risk for sudden infant death syndrome (SIDS), acute respiratory infections, ear problems, and more

severe asthma. Smoking by parents causes respiratory symptoms and slows lung growth in their children” [U.S. Department of Health and Human Services 2006]. New Zealand studies support many of these relationships. Most of the evidence relates to exposure to second-hand smoke in home settings but there is some evidence that exposure to smoke inside cars is associated with respiratory symptoms in children [Sly et al 2007].

From New Zealand there is evidence that children who are exposed to SHS in the home are more likely to smoke themselves [Darling & Reeder 2003a]. There have also been two recent reviews of New Zealand studies. One on attitudes and knowledge of SHS in homes and cars [Thomson et al 2005b] and another on the effects and exposure and effects in homes [Thomson et al 2005c]. Since these reviews there has been additional survey data and air quality data relating to smoking in both homes and/or cars [Gillespie et al 2005; Edwards et al 2006b; Martin et al 2006].

It should be noted that there are downstream benefits from smokefree homes, in terms of reduced smoking initiation and increased quitting. The available evidence suggests that household smoking bans reduce smoking initiation and the contributing factors (lower perceived prevalence of adult smoking, negative attitudes about the social acceptability of smoking) [Proescholdbell et al 2000; Wakefield et al 2000; Conley Thomson et al 2005; Szabo et al 2006]. New Zealand evidence is consistent with this international evidence [Darling & Reeder 2003a; Scragg et al 2003]. Smokefree homes are also associated with reduced tobacco consumption per smoker, increased quit attempts, and greater success in the attempts [Shields 2005; Borland et al 2006].

New Zealand has had media campaigns on smokefree homes and cars. These were “Take the smoke outside” from 2004, and “Make your car smokefree/Kia auahi kore o tatou waka” from 2006 (<http://www.secondhandsmoke.co.nz/media/media.shtml>). Of interest is the use of “social threat” as well as “health threat” themes in these campaigns. Although mass media campaigns are usually the key component of community education, a range of other health promotion approaches can also be used as part of such education eg, health worker advice, distribution of health educational print materials etc.

***Evidence for effectiveness:*** The systematic review by the TFCPS on the evidence for community education to reduce exposure to SHS in the home found that the evidence was “insufficient”. This result was based on data collected prior to May 2000 and was attributed to the small number of available studies and limitations in the design and execution of these studies. Also, most of the interventions were on a small scale and not at a population-level.

A number of reviews have looked at individual or household level interventions [Gehrman & Hovell 2003; Roseby et al 2003; Klerman 2004]. But these cannot be considered as being directly population-level. One of these reviews [Klerman 2004], made population-level recommendations, around professional education programmes (for providing parental counselling), and enhanced tobacco control involving “community education and regulatory and economic policies (ie, smoking bans and excise taxes).”

The most recent review identified examined population-level government policies to increase the prevalence of homes free of second-hand smoke [Thomson et al 2006]. It reported that for all four countries studied (Britain, USA, Australia, and New Zealand) there was evidence of “some association between relatively comprehensive tobacco control programmes and lower prevalence levels of smoking in homes”. Within comprehensive programmes, it reported that: “there is some indirect evidence that some mass media campaigns could increase the prevalence of smokefree homes. Structural options that have potential to support smokefree homes include smokefree places legislation, and laws for the protection of children”.

***New Zealand evidence:*** Mass media messages have been used in New Zealand to encourage smokefree homes and cars; particularly in the 2004-2006 period. Some of these have been specific campaigns (eg, “Take the smoke outside” [<http://secondhandsmoke.co.nz/media/homes.shtml>]) while others have had SHS components (eg, as part of the: “Its about Whanau” campaign).

In the review by Thomson et al, the pattern of the increasing prevalence of smokefree homes and declining SHS exposure in homes for New Zealand was described [Thomson et al 2006]. A statistically significant reduction in inequalities in home SHS exposure also occurred (due to decreased exposure among Māori). Of note however, was that the different measures and sampling for the 1996 and 2003 adult surveys may have weakened the validity of the comparisons over time.

More specifically, New Zealand data indicate that tobacco-related media campaigns are effective in reaching audiences and even campaigns that focus on SHS are effective in increasing calls to the Quitline (within one hour of being shown) [Wilson 2004; Wilson et al 2005]. For example, the “Every cigarette ...” campaign stimulated 115 calls by Māori callers (within one hour) per 100 TARPs – but a SHS campaign (for “World Smokefree Day”) still stimulated 45 calls per 100 TARPs (with TARPs being a measure for audience exposure of advertisements). Even within SHS campaigns there were statistically significant differences, with more Māori callers responding to the “World Smokefree Day” campaign than the “Lets Clear the Air” campaign [Wilson et al 2005].

Evaluation data on the smokefree homes and cars mass media campaigns run by the Health Sponsorship Council in 2005/2006 have not yet been published. Nevertheless, baseline data to facilitate evaluation has been published [Gillespie et al 2005], along with a qualitative research report [TNS New Zealand 2003].

The “SmokeChange” programme for pregnant women is not strictly a population-level intervention but it has resulted in outcomes of interest. One study of this programme, reported that among the women who continued to smoke, there was a reported reduction in smoking consumption by 40% [Ford et al 2001]. The researchers also reported that “substantial smokefree environment (homes and cars) changes were also made”.

In the New Zealand setting it is plausible that the new smokefree law may have contributed to a reduction in SHS exposure in homes [Edwards et al 2006a]. The Ministry-commissioned 2006 review reported that self-reported SHS exposure in the

home fell from 20% in all households in 2003, to 9% in 2006. The proportion of homes reported as smokefree also increased during this time period (eg, from 64% in 2003 to 70% in 2006 for homes where there were one or more smokers and one or more children living). Reductions in self-reported SHS exposure and increases in smokefree home policies were more marked in Māori households – so the law is likely to have contributed to reducing inequalities in SHS health effects. Consistent with these findings were data from the Year 10 smoking survey, which showed that children’s reporting of smoking in the home decreased (from 30.5% in 2001 to 26.5% in 2005, but with no change in the downward trend between 2004 and 2005).

***Summary of the evidence:*** The systematic reviews by the TFCPS and by the Cochrane Collaboration indicate “insufficient” evidence overall for interventions to reduce SHS exposure in homes. There are however, some studies that are suggestive of benefits (eg, including an intervention in a school setting). There is some evidence that comprehensive tobacco control programmes are associated with increased prevalence of smokefree homes. There is also some suggestive New Zealand evidence (including for mass media campaigns on SHS significantly increasing Quitline calls) and the prevalence of smokefree homes has increased in New Zealand.

***Comments on the evidence:*** The international literature covered by systematic reviews and other reviews is not particularly encouraging. However, this may be partly due to the sub-optimal design of some of the interventions and studies (as reported by the TFCPS and in the CRD critique). In addition, the reviews are largely of individual and household-level interventions. Nevertheless, the New Zealand evidence to date is consistent with SHS media campaigns being effective and so this country should probably continue to explore this area with well-designed intervention studies. One priority is evaluating recent mass media campaigns around smokefree homes and cars (indeed, Ministry-funded evaluation work by the HSC is currently underway).

Evidence that is potentially relevant to campaigns for smokefree cars comes from another TFCPS systematic review. As detailed in the previous section, the TFCPS reported “sufficient” evidence for the effectiveness of “community-wide information and enhanced enforcement campaigns to increase child safety seat use”.

The New Zealand evidence indicates that following the introduction of new smokefree legislation (that became operational in 2004) there was a further decline in SHS exposure in homes after the law. This would suggest that additional smokefree laws (eg, covering outdoor areas and cars) could further contribute to the denormalisation of smoking and the acceptability of SHS.

## 6 Regulatory interventions for product and marketing

### 6.1 Tobacco industry restrictions (regulation of product design)

**Background – Industry restrictions:** There is public health interest in controlling tobacco industry activities, since this is the industry that produces and markets nicotine – the ingredient on which young smokers become dependent. The scope of tobacco industry restrictions is broad and theoretically includes all of the following:

- Regulations around the type and content of tobacco products (eg, nicotine levels, tar levels, types of additives). For example, New Zealand has a ban on sales of smokeless tobacco and the European Union imposes maximum tar/nicotine/carbon monoxide levels.
- Requirements for graphic and textual warning labels on packets (and even packet inserts). For example, New Zealand graphic warnings will be required from 28 February 2008.
- Restrictions on promotion (covering advertising, sponsorship, packaging, and product display at the retail level). For example, New Zealand has restrictions on all of these with some exceptions such as advertising in imported magazines. The Commerce Commission is also currently investigating the use of the descriptor terms “light” and “mild”.
- Restrictions on corporate activities and mandatory disclosure requirements (eg, of internal documents such as marketing plans).
- Legal changes to completely remove the tobacco industry from the tobacco distribution system within New Zealand and replace it with a non-commercial supply by an agency with a public health mandate [Borland 2003; Callard et al 2005; Thomson et al 2005a].

However, this review is not able to address the broad scope of these potential interventions. One of the major remaining promotion activities (point-of-sale displays) is addressed in Section 6.3. Residual promotional activity on packets will also decline somewhat when graphic warnings are introduced into New Zealand, but further changes (eg, even larger warnings on the front of packs) could be investigated. The issue of removing the tobacco industry from the distribution system is complex, and was not in the scope of this review (but potentially merits further investigation eg, [Borland 2003; Callard et al 2005; Thomson et al 2005a]). Similarly, the issues around limiting various tobacco products (cigarettes) while permitting forms that are potentially less hazardous forms (eg, low-nitrosamine oral snuff) are probably best considered in the separate harm-reduction review that the Ministry has commissioned.

Therefore this section just focuses on interventions around tobacco product design – specifically fire-safe cigarettes. The next section focuses on cigarette content.

**Background (fire-safe cigarettes):** Cigarettes are the leading cause of fatal fires and in the USA they are associated with one in four fire deaths [Barbeau et al 2005]. Also fire risk behaviours (including accidentally burning something in the previous two weeks) appear to be quite common among smokers [Snider & Kaiserman 2007].

In June 2004 the first jurisdiction in the world to regulate any aspect of the design of cigarettes was New York State for fire-safe (or “reduced ignition propensity”) cigarettes [McGuire 2005]. Similar laws have been subsequently passed in Vermont State (USA) and for Canada in 2005 (which uses the New York performance standard) [Stanwick 2005]. In New Zealand smoking materials have been found to be the most common source of ignition in fatal residential fires (ie, at 37%) [Waller et al 1998].

**Evidence for effectiveness:** No systematic or other reviews were identified. Nevertheless, the impact of the New York law has been studied, with New York cigarette brands showing clear evidence of altered burn characteristics [Connolly et al 2005]. The New York cigarettes averaged 10.0% full length burns as compared to 99.8% for California and Massachusetts brands. The study reported that the reduced ignition propensity (RIP) was achieved by cigarette paper banding. They also reported no other changes in: cigarette sales, prices, brand availability, and for yields of the majority of smoke constituents tested. “Average yields of tar, carbon monoxide, and two compounds were slightly higher, the yields of seven compounds were higher for one brand only, and nicotine was lower, among New York brands tested.” However, they concluded that “there is no evidence that the small increases in smoke constituent yields affect the already highly toxic nature of cigarette smoke.”

This study reported that “data on smoking caused fires, deaths, and injuries dating from after the change in law are not yet available.” Medline searches did not identify any published data for fire trends in New York, Vermont or Canada since RIP cigarettes were introduced.

Another study has examined smokers’ reactions to RIP cigarettes [O’Connor et al 2006b]. Survey participants in the USA and New York were asked whether their cigarettes “ever go out between puffs” and whether they had noticed any change in the taste of their cigarettes in the past 12 months. The study reported that New York smokers were three times more likely than smokers in other states to report that their cigarettes often went out between puffs (17.3% vs 5.6%). Also, New York smokers “appeared no more likely to report noticing differences in cigarette taste, in intention to quit smoking, or to have made quit attempts.”

Most recently, a Canadian study conducted before and after the law change reported “no significant increases in carbon monoxide “boost” or the intensity of puffing behaviour between baseline and follow-up” [Hammond et al 2007].

**Summary of the evidence:** There is now clear evidence to show that jurisdictions can act to require cigarette design changes, and that these design changes are subsequently made by the tobacco industry. In particular, cigarette performance with regard to burn characteristics can be changed as a result of such laws. Although there is insufficient evidence concerning the impact of such laws on the prevalence of cigarette-related fires, logic would suggest that reduced fire rates are likely to follow.

**Comments on the evidence:** The changes in RIP cigarettes sold in New York described in the above studies are entirely consistent with a subsequent reduction in fire risk. Future studies are likely to be published in the near future and these will

clarify the impact of the laws on actual rates of cigarette-induced fires in the jurisdictions that have passed these laws.

**Comments on implications for New Zealand:** An estimated 48% of New Zealand smokers smoke roll-your-owns [Ministry of Health 2006] which use paper that have relatively low ignition propensity, according to New Zealand-based research [Laugesen et al 2003]. Nevertheless, requiring that all cigarettes sold are RIP would be likely to have some modest benefit in terms of reduced fire risk harm to people, property and bush/forest. It would also help determine in the New Zealand context the difficulties of regulating in this area of cigarette content modification (given tobacco industry opposition being likely).

## 6.2 Tobacco industry restrictions (regulation of content)

**Background:** It has been proposed that setting low maximum standard tar, nicotine, and carbon monoxide yields (coupled with a ban on filter vents), “would contribute to making cigarettes much less palatable and foster smoking cessation or the use of clearly less hazardous nicotine delivery systems” [Kozlowski et al 2006]. Changes in cigarette tar to nicotine ratios may also offer “some modest public health benefit” if smokers obtain satisfying levels of nicotine for less tar and carbon monoxide consumed [Jarvis 2001].

**Evidence for effectiveness:** No systematic or other reviews were identified. One study has compared yields before and after the European Commission standard was implemented [O'Connor et al 2006a]. It found small (but statistically significant) reductions in nicotine levels, tar levels, and carbon monoxide yields in the tested cigarettes but the ratio of tar to nicotine did not change. However, the major finding was that the manufacturers complied with the new standard largely by increasing filter ventilation rates on cigarettes (a design features that promotes compensatory smoking). Therefore the researchers concluded that the current “10-1-10” standard used by the European Commission is unlikely to reduce smoke exposure for smokers. Other commentary around European standards has suggested that an important factor for developing more progressive regulation is having a “comprehensive disclosure regime” [Bates et al 1999].

Other studies of note are as follows:

- A US study published in 2007 looked at potential reduced exposure products (PREPs) ie, cigarettes that are marketed as a means to reduce exposure to tobacco toxicants [Strasser et al 2007]. This study used a US brand of “Quest” cigarettes, which uses genetically-modified tobacco to provide a nicotine step-down approach (eg, nicotine levels at 0.6, 0.3 and 0.05mg, but with equivalent levels of tar (10mg)). Laboratory tests with human smokers identified that compensatory smoking occurred when smokers smoked the lower nicotine cigarettes. Indeed, the increases in carbon monoxide reported “suggest this product can potentially be a harm-increasing product.”

- Another laboratory study examined nicotine intake when smokers consumed reduced-nicotine content cigarettes [Benowitz et al 2006]. It reported that nicotine intake into the body varied significantly with nicotine content of the cigarette and that compensatory smoking when smoking single low-nicotine content cigarettes was incomplete and ranged from -1% (95% CI: -23%, 21%) to 34% (95% CI: -39%, 107%) for 1-mg to 8-mg research cigarettes. This study found that carbon monoxide intake and estimated tar exposure were similar across the cigarettes studied. Also, “low-nicotine content cigarettes were rated as being of lower quality and less satisfying than the 12-mg research cigarette or the usual brand”. The authors concluded that “our study suggests that reduced-nicotine content cigarettes are reasonable candidates for trying to reduce the level of nicotine addiction in smokers.”
- An Australian study examined documentation around low-tar cigarettes in that country [King et al 2003]. It reported that the Anti-Cancer Council of Victoria (ACCV) “built a durable system for measuring and publicising the tar and nicotine yields of Australian cigarettes and influencing their development.” Nevertheless, they found that “behind the scenes”, the tobacco industry used its “substantial knowledge advantage regarding compensatory smoking and its ability to re-engineer cigarettes to gain effective control of the system and subvert the ACCV’s objectives.”
- Other research on tobacco industry internal documents has also described how the industry has exploited the limitations of official testing protocols and has intentionally concealed from consumers and regulators the potential toxicity of their products [Hammond et al 2006a].

***New Zealand evidence:*** ESR has reported on tobacco constituents for the Ministry of Health and has identified a priority list of harmful chemicals in tobacco for monitoring purposes that could inform a possible strategy for harm reduction [Fowles et al 2000]. Another ESR report for the Ministry has reviewed the scientific knowledge on the chemical constituents of tobacco smoke or cigarettes “that may influence the known addictive properties of cigarettes, or otherwise enhance their sensory attractiveness, especially for young people in their first experiences of smoking” [Fowles 2001]. ESR work has also focused on particular brands [Fowles 2003].

One New Zealand study included interviews with public health experts and smokers on the de-nicotinisation issue [Fraser 2002]. It concluded that “there is not enough consensus and scientific evidence to support the introduction of a de-nicotinisation of tobacco policy, nor would there be enough political or public support. However, there is support for New Zealand to contribute to the research effort internationally on the de-nicotinisation of tobacco.”

In addition, the policy options for regulating or controlling tobacco product modifications in New Zealand have been examined [Allen & Clarke Ltd 2003]. This study suggested that “requiring full disclosure of additives used in tobacco products, and prohibiting the use of new additives unless it can be conclusively shown that they have a health benefit”; and “As an initial step towards any regulation in this area, it is

necessary to engage in continued research, monitoring and surveillance of tobacco products, design and marketing so that innovations by tobacco companies can be factored into the final policy decision”.

The study concluded: “A policy that reduces the exposure of smokers to harmful toxins risks undermining other harm reduction policies, because, without adequate coordination, education programmes, and regulatory measures, the provision of cleaner sources of nicotine could make it easier for non-smokers to become nicotine-dependent and more difficult to encourage nicotine-dependent people to cease use of tobacco products. The health effects of new or altered products are unknown. There would have to be thorough investigation before any move to liberalise access to alternative nicotine sources is adopted. Three priorities have been identified for the regulation of tobacco products:

- Revision of testing methodologies and requirements to ensure that there is full information about the content of tobacco products.
- Restriction of any future tobacco or nicotine product innovations unless they have proven health advantages over products currently on the market.
- Research into tobacco products and tobacco product regulation, including research with a New Zealand focus.

***Summary of the evidence:*** There is insufficient evidence concerning the regulation of nicotine, tar or other cigarette constituents. Nevertheless, some laboratory evidence is suggestive of possible public health benefits and so further research is probably well justified. Yet there is also evidence that tobacco industry actions can potentially subvert public health efforts to alter cigarette content.

***Comments on the evidence:*** This is a very complex area and research needs to consider such factors as:

- If compensatory smoking of low-nicotine cigarettes can potentially increase the intake of other toxicants.
- How changes in cigarette content may need to be accompanied by bans on filter vents and other design features that might counter the public health goals.
- How the nicotine and tar levels may impact on smoker initiation (eg, do high levels make it harder for youth to start smoking?).

There appears to be significant international research underway on changes to cigarette content and so further evidence is likely to be forthcoming in the near future.

***Comments on implications for New Zealand:*** Given its potential importance, New Zealand health agencies should continue to monitor the international research in this area. Certain steps that would help prepare the way for future interventions on cigarette content could be:

- Improving disclosure of current additives and properly enforcing existing law [Thomson & Wilson 2005].
- Commencing regulatory requirements to require RIP cigarettes (as per the previous section).
- Building up toxicological expertise within the New Zealand workforce (eg, at the Ministry of Health or other agencies). This could focus attention on such

critical issues as nicotine levels, the tar to nicotine ratio and filter vents in New Zealand cigarettes.

### **6.3 Enhanced point-of-sale restrictions (and enhanced enforcement of the law)**

**Background:** In New Zealand a law change in 1998 meant the end of most obvious point-of-sale advertising except for tobacco product displays. This 1998 law also ended incentive schemes for the positioning of tobacco products in shops [Fraser 1998]. A possible response to these laws may have included a shift in tobacco industry marketing towards colour branding within stores (as suggested by photographs published elsewhere [Fraser 1998]). There have also been reports that suggest that breaches of the law may also have occurred [Laugesen 1999]. The amendment to the Smoke-free Environments Act in 2003 further restricted the number and type of tobacco packets and cartons on display at or near shop counters. The new law also restricted the placement of tobacco products near sweets and other products attractive to children.

Since the new law, one study in 2006 found that among 288 retailers, 64% were not complying with the law [Anand et al 2006]. In response to these findings, there has been increased concern around such marketing expressed by the Associate Minister of Health responsible for tobacco control [O'Connor 2006], and by tobacco control NGOs [Cancer Society of New Zealand 2006]. The concerns are that the persisting display of cigarette packets and cartons in shops is a hazardous marketing exposure for young people as well as smokers who are trying to quit (or remain quit). There is also concern that the visual presence of these products may distort young people's perceptions about these products being routine consumer goods (rather than being hazardous and addictive products).

**Evidence on the impact of tobacco promotion:** There is evidence from a Cochrane systematic review that tobacco promotion increases the chances of young people beginning to smoke [Lovato et al 2003]. This review noted that the United States Surgeon General's comprehensive review in 1994 of the tobacco marketing literature concluded that advertising and promotional activities influence key risk factors for smoking among adolescents.

Another review reported that advertising bans in some countries have helped to reduce smoking rates [Levy et al 2004]. Based on such evidence, the Framework Convention for Tobacco Control (FCTC) (which New Zealand has signed), requires comprehensive bans on tobacco advertising and promotion [World Health Organization 2003].

**Evidence that point-of-sale tobacco promotions and displays are a hazard:** There is US evidence that visits by young people to stores with tobacco advertising is associated with a 50% increase in the chances of ever smoking (while controlling for social influences to smoke) [Henriksen et al 2004b]. Another US study on 13-year-olds also found that retail tobacco advertising exposure was associated with a 38% increase in experimentation with smoking [Schooler et al 1996].

In Australia, an experimental study with school students found that those exposed to the “tobacco display” condition (compared with those who viewed the “no cigarettes” condition), perceived it would be easier to purchase tobacco from these stores [Wakefield et al 2006]. Also, respondents in the “display only” condition tended to recall displayed cigarette brands more often than respondents who saw no cigarettes.

It has also been reported that cigarette marketing in US stores is more common in those stores where young people shop frequently [Henriksen et al 2004a]. Studies from both Canada and the US also show that retailers with in-store tobacco promotions tend to be located close to schools and that the promotions and cigarettes are often displayed besides sweets and at low eye levels [Dewhirst 2004]. The latter is suggestive of the targeting of children. Similarly, the New Zealand survey data [Anand et al 2006] also indicates that retailer non-compliance with tobacco marketing legislation was significantly more likely in areas with higher proportions of children in the population.

***Evidence for enhanced point-of-sale controls:*** Complete bans on the retail display of tobacco products have been implemented in various Canadian jurisdictions (ie, Saskatchewan; Manitoba; Newfoundland and Labrador; and Nunavut) [Greaves 2003; Sibbald 2005]. Legal challenges to these laws were successfully defeated [Ehman 2004; Sibbald 2005]. A complete ban on the visual display of tobacco has also been successfully introduced in Thailand [Hamann 2006], and similarly for new strict controls in Iceland and Ireland [Paynter et al 2006]. Despite, these actions, there were no reviews or specific evaluation studies of these interventions identified (Medline and Google Scholar searches).

***Summary of the evidence:*** There is evidence from a Cochrane systematic review that tobacco promotion increases youth smoking. There is also some evidence from another review that restrictions on tobacco marketing are associated with lower smoking rates. Collectively these probably provide adequate evidence from a scientific public health perspective to maximise restrictions on tobacco promotion – including retail displays. Although some jurisdictions have enacted complete restrictions on retail displays, evaluations have not been published.

***Comments on the evidence:*** The lack of specific evidence for point-of-sale restrictions from Canada, Thailand, Iceland and Ireland is perhaps not surprising, since these interventions are generally relatively recent. There may also be the view that such evaluations are not critical, given the existing evidence base that tobacco promotion is a risk factor for youth smoking and because the FCTC favours comprehensive restrictions on tobacco promotion.

The recent New Zealand experience with a new smokefree law was suggestive that tobacco use became more denormalised after the law (eg, with declines in SHS exposure in homes). This may provide support for the view that removing tobacco retail displays would also contribute to tobacco denormalisation in the New Zealand setting.

***Comments on implications for New Zealand:*** There is probably an adequate research base for justifying complete retail display restrictions for tobacco in New Zealand – if a government wished to pursue this. This was also the approach suggested by a recent New Zealand study [Anand et al 2006]:

“We conclude that there are two possible frameworks for achieving the objectives of the POS [point-of-sale] regulations in the Smoke-free Acts – either to strengthen the POS regulations and increase retailer education, monitoring and enforcement; or to ban POS displays in all retail environments accessible to children. Of these only the latter seems likely to unequivocally achieve the purpose of the Smoke-free Environments Acts.”

Therefore one research priority for New Zealand in this area would be to assess compliance and effects before and after any such regulation or law was enacted (using a standardised methodology).

## **7 Interventions and research that DHBs can consider**

As detailed in the introduction, many of the tobacco control interventions in this report relate to national-level action. Nevertheless, DHBs can also play potentially important roles in supporting national action or in undertaking local action or research that is particularly relevant to their populations. Below are detailed some of the actions that DHBs could take, by themselves or in collaboration with neighbouring DHBs. This list is far from exhaustive and relates mainly to the key interventions detailed in this report.

### **1) Interventions that impact on both youth (preventing initiation) and adult smokers**

**1.1 Increasing the unit price of tobacco:** DHBs could collectively support studies into identifying the barriers in New Zealand to obtaining future tobacco tax increases. DHBs could also work with researchers to explore the potential and actual effects of tobacco price changes for the populations within their areas (especially the poorest groups of smokers who are most vulnerable to financial hardship). They could also explore research into how their local/regional level tobacco control activities may be undermined by more affordable tobacco (associated with rising average incomes within their populations).

**1.2 Mass media campaigns and community interventions:** When national-level mass media campaigns on smoking issues are conducted, DHBs can add media weight to these campaigns by funding local/regional television and radio advertising. Indeed, DHBs already have experience in integrating local media activities with national ones (eg, around World Smokefree Day). There may also be scope for DHBs to run their own mass media campaigns that are focused on their district or regional populations. DHBs could also work with national evaluators to explore the effects of national campaigns within their areas.

### **2) Interventions that particularly impact on youth (preventing initiation)**

**2.1 Restricting youth access to tobacco products:** To better clarify the role of youth access interventions in New Zealand, DHBs could collectively support further research (eg, a study of intensive enforcement with community mobilisation in several DHBs, with the other DHBs acting as controls). However, for the reasons detailed in Section 3.3, this may not be a high priority area for local tobacco control efforts.

**2.2 School-based education relating to smoking:** DHBs may wish to work with schools in their districts to evaluate current school-based programmes and the impact of smokefree policies on these schools. They could also consider studies involving enhanced school-based social influence interventions (with the controls being schools providing current programmes).

**2.3 Media interventions relating to movies and television:** DHBs could individually or collectively fund intervention studies into pre-film anti-smoking advertising in local cinemas.

**2.4 Smokefree sponsorship and removing tobacco sponsorship:** Studies of these interventions could be performed at a district or regional level (by DHBs individually or collectively). Also, DHBs could work with local government to ensure that local government funding support for sports and cultural activities is conditional on the adoption of state-of-the-art smokefree policies (including for outdoor areas).

**2.5 Specific interventions of particular relevance to Māori and Pacific youth:** DHBs could individually or collectively support studies into mass media campaigns that are specifically designed to engage Māori and Pacific youth. This work could build on national smoking cessation campaigns that have been designed specifically for Māori and Pacific audiences. They could also work with national evaluators to explore the effects of campaigns within their areas. Because of the likely benefit in terms of decreasing smoking initiation, DHBs could also support district/regional efforts to increase smokefree homes in Māori and Pacific communities.

### **3) Interventions that particularly impact on adult smokers**

**3.1 Smoking cessation contests:** As detailed in Section 4.5, the running of Quit and Win contests may not be a high priority activity for tobacco control. Nevertheless, it is an intervention that could be run at the DHB district level, city level or town level. Well designed interventions and evaluations would help inform the use of this intervention in other parts of New Zealand.

**3.2 Specific smoking cessation interventions of particular relevance to Māori and Pacific peoples:** Many of the options in Section 4.6 for the national level could also be undertaken by individual DHBs or by DHBs collectively (eg, strengthening smoking cessation mass media campaigns for a Māori audience and research around church-based support).

**3.3 Enhancing alcohol control (regarding impacts on tobacco consumption):** The potential for tobacco control benefits from alcohol control interventions could be considered by DHBs. In particular, it could strengthen the case for DHB driven enhancements to local/regional level alcohol control activities.

### **4) Interventions for smokefree environments**

**4.1 Enhanced public and workplace smokefree area regulations:** DHBs could undertake evaluation work of the outdoor smokefree restrictions already in place within their districts (eg, the smokefree parks, smokefree hospital grounds and smokefree university campuses). They could also work with local government to undertake intervention studies for the expansion of smokefree outdoor areas (ideally with control areas in other parts of the DHB district).

**4.2 Community education to reduce exposure to SHS in the home and in cars:** DHBs could undertake studies to determine the prevalence of smokefree homes and smokefree cars within their DHB districts. They could also work with national evaluators to explore the effects of national campaigns within their areas. Furthermore, they could support local mass media campaigns (using local television and radio) to supplement or enhance national level campaigns (ie, being run by the HSC).

**4.3 Enhanced point-of-sale restrictions (and enhanced enforcement of the law):** DHBs could enhance monitoring activities and prosecute retailers who are breaking the current law around retail displays. Surveys that highlight non-compliance with the law may also attract media publicity that improves compliance (or strengthens the case for a new national-level law).

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