

Review of the Evidence for Major Tobacco Control Interventions

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1 Introduction

The material in this document was part of a larger paper produced in late 2002 to inform the discussion around the development of the Ministry's five-year plan for tobacco control. Given the vast range of possible tobacco control interventions, this work has generally focused on just the major interventions. Nevertheless, it is has attempted to include evidence from New Zealand-specific research where this has been published.

An attempt has also been made in the sub-sections titled "comments" and "possible implications for New Zealand" to consider the potential relevance of the international evidence for the New Zealand setting. A key purpose of this commentary was to stimulate discussion around the five-year plan and so it does not represent actual Ministry of Health policy. To obtain details on the current Ministry policy, readers are directed to the final version of the Ministry's five-year plan for tobacco control.

2 Methodology of the review

This review is based primarily on the findings of the most thorough and up-to-date review identified – by the United States Task Force on Community Preventive Services (TFCPS) (Hopkins et al 2001). It has been supplemented with the findings of Cochrane systematic reviews and other major reviews (eg, Fiore et al 2000). The New Zealand evidence is based on Medline searches and unpublished reports available to the Ministry of Health.

Systematic reviews: The Cochrane Library was searched for relevant systematic reviews (Issue 3, 2002). While Cochrane 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 reviews published in 1998 (Olsen et al 2001). Other systematic reviews were searched for in the Database of Abstracts of Reviews of Effectiveness (DARE website) and by the recommended methods for review identification (Glanville and Lefebvre 2000).

The recent reviews by the United States Preventive Services Task Force (USPSTF website), the United States Task Force on Community Preventive Services (TFCPS website), and the Canadian Task Force on Preventive Health Care (CTFPHS website) were examined.

The most important and up-to-date single systematic review identified was by the TFCPS (Hopkins et al 2001). The next was the review undertaken to prepare United States guidelines for smoking cessation (Fiore et al 2000).

Medline searches: Numerous Medline searches for articles relating to tobacco control interventions were conducted for the period 1966 to August 2002. A particular focus was on "systematic reviews", other "reviews", "randomised controlled trials" and articles relating to "New Zealand" and "Maori". Due to time constraints, not all interloans arrived before the deadline of the initial phase of producing this document

– hence some material was based on examination of the Medline abstract only (signified by the term “[Medline abstract]” in the references).

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 a precautionary approach is taken 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).

3 Summary of findings for effectiveness

A summary of the findings of major reviews for major tobacco control interventions are detailed in the table below. Following this are sections with more detailed consideration of the evidence on specific interventions.

Table 1: Summary of the findings of major reviews for major tobacco control interventions

Intervention	TFCPS Review	Findings from other major reviews and relevant New Zealand evidence
<i>Strategies to reduce smoking initiation by children, adolescents, and young adults</i>		
Increasing the unit price for tobacco products	Strong scientific evidence	Strong evidence (two major reviews). NZ data is supportive.
Mass media campaigns (when combined with other interventions)	Strong scientific evidence	“Some evidence” (Cochrane review).
School-based education	–	Cochrane review underway but a meta-analysis and various other studies provide supportive evidence.
Restricting youth access to tobacco	Review underway	Strong evidence for reducing sales but limited for smoking prevalence (Cochrane review). Insufficient evidence (for smoking prevalence) according to another systematic

Intervention	TFCPS Review	Findings from other major reviews and relevant New Zealand evidence
Tobacco industry restrictions (promotion / cigarette content etc)	Review underway	review. NZ evidence supportive for reducing sales. Cochrane review underway (on advertising). A Surgeon General report found that advertising was a risk factor. Some preliminary international and NZ work around cigarette content is promising.

Strategies to increase smoking cessation

Increasing the unit price for tobacco products	Strong scientific evidence	Strong evidence (World Bank review). NZ data strongly supportive.
Mass media education – Campaigns (when combined with other interventions)	Strong scientific evidence	No other major reviews. NZ data supportive.
Mass media education – Smoking cessation series	Insufficient evidence	No other major reviews. NZ data strongly suggestive of effectiveness.
Mass media education – Smoking cessation contests	Insufficient evidence	Strong evidence (one review).
Self-help smoking cessation resources	–	Strong evidence (Cochrane review).

Interventions appropriate for health care systems (smoking cessation)

Smoking cessation counselling by health professionals	–	Strong evidence (3 systematic reviews including a Cochrane review).
Group counselling for smoking cessation	–	Strong evidence (Cochrane review and another systematic review).
Enhancing partner support to improve smoking cessation	–	Some evidence for <i>no</i> effect (Cochrane review).
Physical activity interventions for smoking cessation	–	Insufficient evidence (Cochrane review).
Provider reminder systems (alone)	Sufficient scientific evidence	No other major reviews.
Provider education programs (alone)	Insufficient evidence	No other major reviews.
Provider reminder + Provider education (with or without patient education)	Strong scientific evidence	No other major reviews.
Provider feedback systems	Insufficient evidence	No other major reviews.
Patient telephone support (quit lines) when combined with other interventions	Strong scientific evidence	Strong evidence (Cochrane review and another systematic review). NZ evidence is supportive.

Intervention	TFCPS Review	Findings from other major reviews and relevant New Zealand evidence
<i>Smoking cessation for specific populations</i>		
Smoking cessation interventions for hospitalised patients	–	Strong evidence (Cochrane review).
Smoking cessation interventions for young people	–	Cochrane review underway.
Pre-operative smoking cessation interventions	–	Insufficient evidence (Cochrane review).
Interventions of particular relevance to Pacific peoples	–	Available studies are supportive of church-based smoking cessation interventions. The benefits versus the harms of kava require further clarification.
<i>Pharmacotherapy for smoking cessation</i>		
Reducing out-of-pocket costs for effective smoking cessation treatments	Sufficient scientific evidence	No other major reviews. NZ evidence is supportive.
Use of, and access to, nicotine replacement therapy (NRT)	–	Strong evidence (2 Cochrane reviews and another systematic review). NZ experience is supportive.
Bupropion or nortriptyline for smoking cessation	–	Strong evidence (Cochrane review). Another systematic review found strong evidence for bupropion but less so for nortriptyline.
<i>Strategies to reduce exposure to second-hand smoke (SHS)</i>		
Smoking bans and restrictions	Strong scientific evidence	Strong evidence (2 systematic reviews). NZ studies are all supportive.
Community education to reduce SHS exposure in the home environment	Insufficient evidence	Cochrane review underway.
Smokefree sponsorship (relevant to smokefree environments and smoking cessation)	–	No major reviews. Available studies indicate benefits.
Smoking cessation counselling for pregnant women	–	Strong evidence (Cochrane review and 3 other systematic reviews). Limited NZ data are supportive.
<i>Other related interventions</i>		
Specific nutrition advice to smokers (for chronic disease prevention)	–	“Fair evidence” for nutritional advice (Canadian Task Force). But evidence concerning vitamin supplementation is conflicting.

4 Summary of economic evaluations

A summary of the economic evaluations identified in the TFCPS review are detailed in the Table 2 below. This review only conducted systematic reviews of economic evaluations for interventions that were either “strongly recommended” or “recommended” as determined by the level of evidence for effectiveness (see the preceding Table). The complete evidence tables summarising economic evaluations are detailed on the TFCPS website. These data suggest that tobacco control interventions are very cost-effective relative to other health sector interventions. Other cost-effectiveness data not considered by the TFCPS are detailed in Table 3 below.

Table 2: Summary of the economic evaluations from the TFCPS review

Intervention*	Summary measure (in 1997 \$US dollars)[‡]	Comparison Group
<i>Strategies to reduce exposure to SHS</i>		
Smoking bans and restrictions	Net present benefit for US \$60 billion [†] <i>n</i> =1	Existing restriction reaching 23% of the population
<i>Strategies to reduce smoking initiation by children, adolescents, and young adults</i>		
Mass media campaigns	\$333/QALY saved <i>n</i> =1	School programme
<i>Strategies to increase smoking cessation</i>		
Mass media education campaigns	\$151-\$805/QALY saved <i>n</i> =2	No comparison group
<i>Interventions appropriate for health care systems</i>		
Provider reminder systems (alone)	No economic evaluations were identified that met the TFCPS inclusion criteria.	–
Provider reminder + provider education (with or without patient education)	No economic evaluations were identified that met the TFCPS inclusion criteria.	–
Reducing patient out-of-pocket costs for effective smoking cessation treatments	\$83/QALY saved [§] <i>n</i> =1 Net benefit: \$534-1449 per enrollee <i>n</i> =1	Standard coverage No comparison group
Patient telephone support (quit lines) Cohort:		
– Pregnant women	\$148-\$344/QALY saved <i>n</i> =2	Usual care
– Adult patients in clinic or hospital	\$1248-2532/ QALY saved <i>n</i> =2	Usual care
– Patients after acute myocardial infarction	\$123/QALY saved <i>n</i> =1	Usual smoking cessation

Intervention*	Summary measure (in 1997 \$US dollars) [†]	Comparison Group programme
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Notes:

* Additional economic evaluation data on increasing the unit price for tobacco products for strategies to reduce smoking initiation and to increase smoking cessation are detailed in the relevant sections later in this document.

[†] Range average (with range based on high and low estimates of benefits and costs).

[‡] *n* represents the number of studies.

[§] Range average (with range based on level of coverage).

Table 3: Additional cost-effectiveness data on interventions not covered by the TFCPS review

Tobacco control intervention	Cost per life year gained (\$US)	Ranking by cost per life year gained \$NZ (PPP- adjusted) (mid- values for ranges)*	Refer- ence/s
Smoking cessation contests (Other economic analyses show very favourable results for cost per quitter eg, \$24 (Korhonen et al 1992); \$42 (NPHIF 1998); \$176 (Lando et al 1995); \$385 (Roberts et al 1990); \$428 (Shipley et al 1995); \$Can165 (Leinweber et al 1994)).	\$250	\$162	Tillgren et al 1993
Taxation leading to a 10% price increase in tobacco for high income countries (World Bank estimate)	\$161 – 645 [DALY]	\$261	Jha and Chaloupka 1999
Community based heart health promotion campaign (to reduce heart disease risk factors, including smoking).	£117 to 160	\$448	Baxter et al 1997
Nicotine replacement therapy – publicly provided with 25% coverage (World Bank estimate for high-income countries). For other studies on NRT see Table 4 in the section on NRT.	\$746 – 1160 [DALY]	\$618	Jha and Chaloupka 1999
Price increases (taxation) – 10% for high-income countries.	\$83-2771 [DALY]	\$925	Ranson et al 2002
Provision of simple smoking cessation advice by a health provider (2 meta-analyses – over 39 randomised controlled trials (RCTs)), (there is little variation by gender or by specific age groups – Cummings et al 1989) (United States).	\$1500	\$972	Law and Tang 1995
Anti-smoking mass media campaign (Scotland)	£304-656	\$1554	Ratcliffe et al 1997
Nicotine replacement therapy – in a model for high-income countries.	\$750-7206 [DALY]	\$2578	Ranson et al 2002

Tobacco control intervention	Cost per life year gained (\$US)	Ranking by cost per life year gained \$NZ (PPP-adjusted) (mid-values for ranges)*	Reference/s
Specialist smoking cessation clinic services	\$6828	\$4426	Croghan et al 1997

Notes:

* Purchasing power parity (PPP) adjusted. Adjustment for PPPs provides a crude mechanism for comparing health spending between countries on a common basis. PPPs can be considered the rates of “currency conversion” that equalise the purchasing power of different countries. A limitation with the use of this type of adjustment is that it tends to adjust better for interventions in which health worker time is a major variable – as opposed to the cost of materials eg, pharmaceuticals (which may vary less extensively between countries). However, the cost of many pharmaceuticals may largely reflect R&D costs and marketing costs – of which human time costs may be a relatively large component. The per capita health expenditure used in the PPP adjustments (in \$US) for the countries in this analysis are as follows: Canada \$2095; United Kingdom \$1347; United States \$4090 (MoH 1999). The exchange rate used for \$US:\$NZ was 1:0.51.

Another limitation with the approach taken with this league table is that the costs have not been inflation adjusted to produce uniform values for a standard comparison year. However, given low rates of inflation in the countries involved, this is probably only a minor limitation.

5 Strategies to reduce smoking initiation

5.1 Increasing the unit price of tobacco

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 (Hopkins et al 2001). The price elasticity of demand for tobacco use participation ranged from -0.07 to -0.52 (median = -0.37). Other major reviews have also reported that tobacco price increases reduce the uptake of smoking and tobacco consumption by young people (Jha and Chaloupka 1999; USDHHS 2000).

New Zealand evidence: The New Zealand data on tobacco price increases and tobacco initiation has not been analysed in regard to young people. However, it seems likely that the overall population pattern of decreased tobacco consumption with increasing price (see section 6.1) would probably apply to limiting smoking uptake by young people. Also recent New Zealand data suggest that cigarette smoking is positively related to the amount of pocket money provided to adolescents (Scragg et al 2002). 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).

Comments: Reducing the uptake of smoking is only one of the potential benefits of raising tobacco taxes. But it may also be the best reason. 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 black adolescents were more responsive to differences in product price than white 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. More research in the New Zealand context is desirable though the studies that link “pocket money and smoking” and “having money to spend with tobacco buying” are suggestive that affordability is a determinant of youth smoking rates.

Possible implications for New Zealand: That the health sector strongly promote further tobacco taxation increases to deter smoking initiation.

5.2 Mass media campaigns

Evidence for effectiveness: There is “strong scientific evidence” that mass media campaigns are effective in reducing smoking prevalence in adolescents when combined with other interventions according to the TFCPS. These “other interventions” include excise tax increases, school-based education programmes, contests, and community education programmes. However, there is 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 has also examined mass media interventions for preventing smoking among young people (Sowden and Arblaster 2001). 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”.

Economic evaluation: The TFCPS identified a high quality United States study that found a programme cost per smoker averted of \$US 6069. The cost per quality-adjusted life year (QALY) was \$US 333.

New Zealand evidence: Although New Zealand has run a mass media campaign aimed at young people (the “Why Start” campaign) this campaign was not associated in time with any reduction in the national smoking prevalence levels of school students (for trend data see: Laugesen and Scragg 1999b). However, this campaign was a relatively low budget one and the campaign themes were generally not particularly “hard hitting” (ie, relative to campaigns used for young people in Florida and Massachusetts).

Comments: The evaluation of the mass media campaigns in Florida USA, provides evidence of effectiveness amongst different ethnic groups of adolescents – including whites, blacks and Hispanics (CDC 1999; FDH 2002). This finding is of potential relevance to the New Zealand setting with its ethnic diversity.

Possible implications for New Zealand: That the health sector support mass media campaigns aimed at preventing smoking initiation, but possibly make these components of broader campaigns that also address smoking cessation and SHS issues (see sections 6.2 and 6.3).

5.3 Restricting youth access to tobacco products

Evidence for effectiveness: A review of this intervention has not yet published by the TFCPS. However, a systematic review of nine studies found that there was no detectable relationship between the level of merchant compliance with laws restricting access and smoking prevalence (Fichtenberg and Glantz 2002b). Also there was also no evidence that an increase in compliance with these restrictions was associated with a decrease in smoking prevalence. Furthermore, there was no significant difference in youth smoking in communities with youth access interventions compared with control communities. This review has been criticised, with this criticism being answered by the authors (DiFranza 2002; Fichtenberg and Glantz 2002a).

A Cochrane systematic review examined 27 studies of which 13 included controls (Stead and Lancaster 2000). It reported that interventions with retailers can lead to large decreases in the number of outlets selling tobacco to youths. However, there was limited evidence for an effect of this intervention on youth perception of ease of access to tobacco and on smoking behaviour. The reviewers considered that this finding might be explained by the fact that few of the communities studied achieved sustained levels of high compliance. This review also found that giving retailers information was less effective in reducing illegal sales than active enforcement and/or multicomponent educational strategies.

New Zealand evidence: The New Zealand data indicate that major changes in cigarette purchasing behaviour by fourth form students occurred between 1992 and 1997 (Laugesen and 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 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%).

Yet over this period daily, weekly or monthly combined smoking prevalence increased by 27% (from 23.4% in 1992 to 28.5% in 1997) among fourth form students (Laugesen and Scragg 1999b). Daily smoking increased from 11.6% in 1992 to 15.5% in 1997.

Also other New Zealand data for 14-17-year-old students indicates that around two in every three respondents had not experienced any difficulties in buying cigarettes (HSC 2000 cited in MoH 2002). From this survey data, a preliminary estimate is that this population spends around \$26 million a year on illegal purchases of tobacco (Reeder and McGee 2002). Retailers gross around \$7 million per year from these illegal sales, which compares to around \$50 000 imposed through fines per year.

Comments: There is little doubt that youth access interventions can reduce sales of tobacco to young people (especially if such interventions involve regular enforcement). However, there is still uncertainty about whether or not such interventions actually reduce smoking behaviour. This is because young people may have various other ways of obtaining tobacco (eg, from parents, older friends or older siblings). Also the 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 and Glantz 2002b).

One argument for high 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 (with the fines being substantial). Another argument is that if the government does not take the illegal sales issue seriously, then this might be perceived by young people to suggest that smoking is not as hazardous as suggested.

Another cost-saving strategy for the health sector would be to transfer this responsibility for law enforcement to the police. This would allow smokefree officers to devote more time to enforcing smokefree environments legislation. Contracting out controlled purchase operations to other agencies may also reduce expenditure in this area.

Possible implications for New Zealand:

- That the health sector give consideration to reducing the current level of investment in reducing tobacco sales to youth and consider diverting some of these resources to other areas such as enforcement of smokefree environments.
- That where retailers are prosecuted for underage tobacco sales, the fines are substantially increased and the prosecutions are very well publicised.
- That the health sector considers encouraging the police to take over responsibility for law enforcement in this area.

5.4 School-based education relating to smoking

Evidence for effectiveness: The review on this subject being undertaken by the TFCPS has not yet been published. Also a Cochrane systematic review of school-based programmes for preventing smoking is currently underway (Thomas and Busby 2002).

Others have reported that school-based programmes appear to reduce both incidence (eg, Abernathy and Bertrand 1992) and prevalence (Elder et al 1993) of smoking in adolescents at 2-4 year follow-up. One study has shown mean lifetime cigarette consumption at 22% lower among the programme subjects at 15-year follow-up (Vartiainen et al 1998). Nevertheless, the overall benefit of these programmes may only be around a 5% reduction according to one meta-analysis (Rooney and Murray 1996).

The USPSTF (1996) considered that the most effective of these school-based programmes are ones that teach skills to resist social pressures to use tobacco and teach the short- and long-term consequences of its use (Bruvold 1993). In a review by Reid et al (1995) it was considered that health authorities should focus on “comprehensive programmes within the broader concept of the health promoting school, with its emphasis on self esteem, health promoting policies, and family and community links”.

New Zealand evidence: No published evaluation studies were identified. One study has reported that there is substantial variation in how schools cover smoking issues (Darling and Reeder 2002). This study also reported on how some schools provide smoking cessation support for students and also what punitive sanctions are used when students are caught smoking. Another New Zealand study has reported that a “smokefree schools grant programme” appeared to have positively influenced policy development toward totally smokefree schools (Heckert and Matthews 2000).

Comments: The value of school-based smoking-prevention should be informed by the systematic reviews that are currently underway. Nevertheless, the existing literature does suggest that such interventions have some benefit – particularly where these interventions involve skill development.

The literature on school-based substance abuse prevention training also provides some limited support for interventions in this area. One review concluded that: “behavioral, emotional, and environmental factors that place children at risk for the development of substance abuse may be remediated through prevention and intervention programs that use research-based, comprehensive, culturally relevant, social resistance skills training and normative education in an active school-based learning format (Belcher and Shinitzky 1998). However, another review in this area noted that: “accumulating evidence casts doubt on the effectiveness of widely disseminated school-based prevention approaches, although theory-based programs that emphasize skills training and adjunctive parent and neighborhood interventions fare better” (Gutman and Clayton 1999).

Possible implications for New Zealand: That the health sector await the evidence from systematic reviews that are currently underway before making any major new decisions about funding school-based educational interventions relating to smoking.

5.5 Tobacco industry restrictions (regulation of content, labeling, promotion)

Background: Tobacco industry restrictions can cover many forms including the content of cigarettes (nicotine levels, tar levels, types of additives); requirements for warning labels on packets; and restrictions on promotion (covering advertising, sponsorship, plain packaging, and product display at the retail level).

Evidence for effectiveness: The review being undertaken by the TFCPS has not yet published. Similarly, a Cochrane systematic review on the impact of advertising on adolescent smoking behaviours is currently underway (Lovato et al 2002). However, these authors have 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. A recent study has also identified that point of sale advertising increases positive brand user imagery among primary school students (Donovan et al 2002).

In Canada there is legislation requiring tobacco companies to test and report on all ingredients and additives in their cigarettes (including the chemicals used to treat papers and filters). Furthermore, the companies must report on 44 selected poisons found in tobacco smoke. Some ingredients listed on Canadian cigarette packs have high levels of public recognition (eg, "formaldehyde") [MJ Kaiserman, personal communication].

New Zealand evidence (promotion): Regulations in this country currently prohibit tobacco sponsorship and advertising, require warning labels on packets, and place restrictions on product displays in retail venues. The decline in tobacco use since the Smoke-free Environments Act 1990 is consistent with these interventions having some benefit in terms of restricting promotion and denormalising smoking. However, no specific evaluations of these interventions have been conducted. There are also ways in which tobacco promotion continues in the New Zealand setting including: advertisements in imported magazines, positive images of smoking in television programmes and in movies, and the promotional material on packets (including the display of packets in retail outlets).

A New Zealand study has examined the responses of adolescents to the inclusion of smoking images in film (McCool et al 2001). It found that their "nonchalant response is linked with the perception that smoking is normal and prevalent". The authors considered that smoking imagery in film "may play a critical role in reinforcing cultural interpretations of tobacco use, such as its role as a means of stress relief, development of self-image and as a marker of adult independence".

Other work has identified that there is significant tobacco-imagery in videos (Singh 1995) and on New Zealand television (Thomson and Wilson 1998; Singh and Thomson 1994). Articles in New Zealand's print media reflect these concerns (Philip 1998). An examination of magazines in a New Zealand suburban public library in 2002 also revealed a significant minority with tobacco advertising (eg, the magazines: "Attitude", "GQ", "Q Review", and "Rolling Stone").

In terms of promotion from retail displays there are anecdotal reports from supermarkets of how tobacco sales decline when tobacco products are shifted from carousels to kiosks [Report by a Smokefree Officer]. There are also examples of how the industry is using various devices to promote tobacco sales of particular brands (eg,

packaging radios and CD cases with cigarette packets in 2002) [Samples provided by Smokefree Officers at the National Workshop for Smokefree Officers, Wellington: 11 September 2002].

New Zealand evidence (content): New Zealand research published in 1997 indicated relatively high nicotine contents in New Zealand cigarettes compared to the levels of Canadian and United States cigarettes (Blakely et al 1997; Blakely and Symons 1997). Subsequently, the tobacco industry's own data was examined by the Smokefree Coalition (1997). It reported that for New Zealand's top 30 brands the average tar was 13.4 mg and nicotine 1.1 mg per cigarette, compared with an average 6.8 mg of tar and 0.65 mg of nicotine in the smoke of the top 30 brands of Australian cigarettes.

New Zealand cigarettes also contain many additives, including honey and sugars at 3.0% and 5.5% by weight respectively (Data sheet 2000). Furthermore, the amount of sugar, honey and menthol in New Zealand tobacco has been reported as increasing in some years (Daniels 2000).

ESR has reported on tobacco constituents for the Ministry (NDP website) 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). Of particular concern are: 1,3 – butadiene (a carcinogen), acrolein (a potent respiratory irritant), and hydrogen cyanide (a key factor for cardiovascular disease risk). Fowles et al also reported that concerning tobacco additives: “many others appear to be added for enhancing flavour or influencing pH of the tobacco, which would influence the absorption of certain compounds, such as nicotine.”

Another ESR report 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 2001a). An ESR toxicologist has also suggested that ammonia in cigarettes is an unlikely flavourant and that it is likely to alter the chemistry of the tobacco so as to increase nicotine absorption (Fowles 2001b).

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.”

To date, there have been no specific interventions in the New Zealand on regulating the content of tobacco products in this country. Nevertheless, the draft smokefree environments legislation currently under consideration may facilitate progress in this area.

Comments: It is desirable to obtain the outcome of the current systematic reviews that are underway. Nevertheless, New Zealand could still consider various interventions

that have been introduced elsewhere and evaluate their impact in the New Zealand setting. Examples include:

- Enhancing health warnings to the standard set by Canada (with colour pictures on packets). Such warnings could address such concerns as impotence and blindness caused by smoking (Wilson et al 2001).
- Enhancing restrictions on product display to “below the counter” as used in Saskatchewan (a Canadian Province). This approach would not be practically difficult according to Smokefree Officers [Feedback provided at the National Workshop for Smokefree Officers, Wellington: 11 September 2002].
- Imposing limits on nicotine levels in cigarettes (eg, as done by the European Union).

One difficulty with the government regulating the composition of tobacco products is the capacity of the tobacco industry to enhance nicotine absorption by modifying cigarette composition in various ways (Kessler 2001). This would suggest that the government would need a vigorous monitoring programme to ensure that nicotine levels delivered to the smoker were actually declining in response to the regulatory interventions. Furthermore, very major reductions in nicotine levels will probably be required before there is a significant reduction in the risk of young people becoming addicted.

Possible implications for New Zealand:

- That the health sector further explore ways in which to control the content of tobacco products (eg, reduce levels of nicotine over time and to remove tobacco additives that might make smoking more attractive to young people).
- That the health sector further explores ways in which to control the promotion of tobacco products (eg, require all tobacco products to be kept under the counter of retail outlets).
- That the health sector further explore the adoption of more prominent health warnings (eg, as per the pictorial images in Canada). Progress in this area may be facilitated by the draft legislation currently under consideration.
- That the health sector consider encouraging government to impose a levy on imported magazines that contain tobacco advertisements.
- That the health sector explore the issue of mandatory anti-smoking advertisements in movie theatres before any movies which contain positive images about smoking.

6 Strategies to increase smoking cessation (population level)

6.1 Increasing the unit price for tobacco products

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 (according to the TFCPS). This finding was based on data from 17 qualifying studies. 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, blacks and Hispanics), in low-income populations, and in those with poor education. Particular evidence that low-income groups reduce tobacco consumption in response to tobacco price increases to a greater extent than do high-income groups come from both the United States and the United Kingdom (Farrelly et al 1998; Townsend et al 1994). This response has implications for reducing health inequalities.

According to a review by the World Bank, international data on the effectiveness of tobacco taxation to reduce tobacco consumption is convincing – including for the prevention of the uptake of smoking by young people (Jha and Chaloupka 1999). Another review by these authors concluded that: “tax increases are the single most effective intervention to reduce demand for tobacco” (Jha and Chaloupka 2000). For high-income countries, a price increase of 10% tends to reduce smoking by about 4%. A review of tobacco company internal documents also provides clear 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 2002).

New Zealand evidence (effectiveness): The TCPS review included one New Zealand study that provided supportive evidence for tax increases reducing tobacco sales (Laugesen and Meads 1991).

There is certainly strong New Zealand evidence that tobacco taxes reduce consumption in New Zealand (reviewed in Wilson and Thomson 2000; and based on household economic survey data – Thomson et al 2000). Also analyses of supermarket cigarette sales data before and after the 1991, 1998 and 2000 budgets (where tobacco tax increases occurred) show sales reductions of 11%, 10% and 16% respectively (for price increases of 21%, 15% and 23% respectively) (CSNZ 2000). Similarly, there were declines in total tobacco consumption associated with the tax increases in 1998 and 2000 and for the excise adjustment on loose tobacco in 1995 (where a 38% increase reduced loose tobacco consumption by 17%) (MoH 2002a). The tax increase in May 2000 was also associated with a marked increase in the calls to the national Quitline (16 000 calls in May 2000 compared with around 6000 per month in preceding months (MoH 2001).

In terms of the impact of tobacco taxation *increases* on different populations, one analysis reported that Māori and Pacific had significantly higher price elasticities than Pakeha (New Zealand European), resulting in smaller increases in spending after any price rise (Darroch 1999). This work was based on individual Household Economic Survey (HES) data. Another analysis (that also used HES data but for the 1988 to 1989 period) reported that “average ‘sole adult and children’ households and Māori ‘sole adult and children’ households reduced the number of cigarettes purchased after a price rise to a greater extent than other types of households” (Thomson et al 2000). These findings are suggestive that tobacco taxation may be a progressive policy in the New Zealand setting (ie, providing a disproportionate benefit to low-income populations).

Yet for those who do not quit or cut consumption after a tobacco tax increase there is some potential adverse impacts on welfare. One study has reported that for some low-income households, 14% of the non-housing budget is spent on tobacco (Thomson et

al 2002). The estimated average tobacco spend in these households was around \$35 per week (which is equal to over 60 percent of reported food spending). This study estimated that 90 000 children were estimated to be at potential risk due to this tobacco spending (in terms of financial hardship reducing food security, food quality, housing quality, educational experiences and access to health care). Further research is required to clarify these impacts.

New Zealand compared to other countries: In terms of the tax rate on a packet of cigarettes as a proportion of the total price, New Zealand ranks 16th amongst developed countries (for those developed countries for which data are available (Mackay and Eriksen 2002)). As regards tobacco prices, a packet of a local brand in New Zealand is ranked seventh most expensive in the developed world (Guindon et al 2002). However, in some jurisdictions within countries, the prices are much higher than the average price for the country (eg, the price of a packet of cigarettes in New York city is around double the New Zealand price).

In terms of affordability (as measured by minutes of labour), New Zealand tobacco is ranked seventh in the world (Guindon et al 2002). Yet using a “Big Mac” index of affordability suggests that New Zealand tobacco is ranked fifth in the world in terms of price (Lal and Scollo 2002).

Comments: The evidence indicates that tobacco taxation increases are likely to produce substantial benefits in terms of reduced tobacco consumption and increased quitting (in addition to deterring uptake of smoking by young people and reduce overall exposure to SHS). Policy makers may want to maximise the benefits of such tax increases while minimising the risks to the welfare of low-income New Zealanders. This could be achieved by further strengthening support for smoking cessation – especially that focused on low-income populations (eg, enhanced promotion of the free national Quitline service; use of subsidised NRT; and expansion of the Aukati Kaipapa programmes). Tobacco tax increases could also be timed to coincide with World Smokefree Day on a regular basis (and be preceded by a concentrated mass media campaign for several months that promoted quitting).

The risk of increased financial hardship for those who don’t quit or cut down their tobacco consumption could be reduced by various other government actions relating to welfare (eg, policies relating to employment opportunities, low cost housing, minimum wage levels, and benefit payments). It may also be possible for social welfare agencies to target households with adult smokers with additional social support (in addition to smoking cessation advice and support).

Possible implications for New Zealand:

- That the health sector strongly support increases in tobacco taxation (particularly pre-announced routine increases).
- That the health sector support the strengthening of smoking cessation activities in the months before pre-announced tax increases (especially those programmes reaching low-income smokers).
- That the health sector support efforts to reduce the risk of financial hardship among low-income New Zealanders (ideally through policies that cover issues of wages, employment, housing, benefits and health costs).

- That the health sector support the use of tobacco tax revenue specifically for funding tobacco control activities.

6.2 Mass media education: Campaigns

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 the TFCPS). These “other interventions” include excise tax increases, community education programmes, and the provision of counselling.

Economic evaluation: The TFCPS identified two relevant studies. One found the cost per quitter ranged from \$US 796 to \$1593 and the other from \$298 to \$655 (with this latter study finding adjusted programme costs per QALY ranging from \$US 151 to \$328).

New Zealand evidence: In New Zealand the Quit/Me Mutu campaign appears to have led to an increased awareness of the benefits of quitting smoking. In 2001 a total of 84 000 people called the Quitline to register to quit smoking, with the level of calls increasing markedly when TV advertising was on air (Unpublished Quit Group reports to the MoH). The proportion of calls from Māori dropped when there was no TV advertising.

The mass media campaign “Its about Whanau” in 2001 also resulted in a substantial increase in the number of calls to the Quitline (Silkstone and Dowden 2002). Preliminary evaluation data indicate high levels of prompted and unprompted awareness of the campaign among Māori in the community (Waa and Grigg 2002). Furthermore, the campaign was regarded as more “believable”, “thought provoking” and of higher “relevancy” than the preceding campaign (“Every cigarette is doing you damage”). While effective in increasing Quitline calls from Māori, the “Its about Whanau” campaign was less effective than the “Every cigarette is doing you damage” campaign (when considering total calls to the Quitline) [Quit Group, personal communication].

Comments: The international experience indicates that it can be difficult obtaining and preserving the funding needed to develop and to maintain a high-intensity campaign of extended duration (TFCPS). This appears to have been so in the New Zealand setting where campaigns since the 1980s have tended to be of short duration and relatively low-budget. Since the year 2000 however, campaigns in New Zealand have been more regular and have been successful in maintaining high call levels to the national Quitline. Yet these campaigns are still low-budget especially when compared to road safety campaigns undertaken by the Land Transport Safety Authority (see the document elsewhere on the Ministry of Health website: “Comparisons of Tobacco Control Spending between Jurisdictions”).

A successful cost saving strategy used in New Zealand is to adapt overseas advertisements to the New Zealand setting (particularly Australian advertisements). There may also be scope for greater use of CDC’s Media Campaign Resource Center

(a clearinghouse of mass media materials produced by states in the United States and other organisations).

Possible implications for New Zealand: That the health sector strongly support the more intensive use of mass media campaigns to reduce smoking.

6.3 Mass media education: Cessation Series

Background: Cessation series are mass media interventions that aim to recruit, inform and motivate smokers to initiate and to maintain cessation efforts.

Evidence for effectiveness: There is “insufficient evidence” to assess the effectiveness of cessation series in reducing tobacco use (according to the TFCPS). This is because of both inconsistent results and inadequate comparison groups in the nine out of 20 studies that qualified for this review.

New Zealand evidence: As detailed in the preceding section, the recent Quit/Me Mutu mass media campaign appears to have been associated with increased calls to the national Quitline. Also contact with the Quitline (in conjunction with use of NRT) is associated with relatively good quit rates according to preliminary survey data (ie, 49% having been quit for one month or longer (BRC 2001)). Even unpaid media publicity on smoking risks appears to prompt increased call rates to the Quitline (Wilson et al 2002).

Comments: The lack of evidence for mass media campaigns promoting cessation in the TFCPS review is of concern. Nevertheless, this could be largely due to methodological issues with the available studies and not with the effectiveness of this intervention. This finding also needs to be seen in the context of the other TFCPS finding that there is “strong scientific evidence” that mass media campaigns “combined with other interventions” are effective (see the preceding section).

Furthermore, the available New Zealand data suggest that the number of calls to the Quitline are closely associated in time with the use of television commercials which cover smoking risks and include the Quitline number.

Possible implications for New Zealand: That the health sector support the more intensive use of mass media campaigns to promote smoking cessation.

6.4 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.

Evidence for effectiveness: There is “insufficient evidence” to assess the effectiveness of cessation contests in increasing smoking cessation (according to the TFCPS). This is because of the small number of available studies of adequate quality

(only one out of 17 studies qualified for this review). In contrast, another review has also found that there is very good evidence that smoking cessation contests are highly effective interventions (Bains et al 1998).

Economic evaluation: This area was not evaluated by the TFCPS. However, a number of economic analyses show very favourable results for cost per quitter from these contests (see Table 3 in the summary of economic evaluations).

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 (HSC data provided to the MoH in 2001; Lambert 2001). A disproportionately high number of contest participants were Māori (32% compared to 22% of the total Hawkes Bay population). The cost per quitter was estimated to be \$988.

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 2002a). Preliminary data indicates 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 media publicity [HSC reports supplied to the MoH].

Comments: Smoking cessation contests have a number of favourable aspects including:

- They may particularly appeal to low-income populations.
- They can be low cost to run (particularly if various sponsors put up the prizes) and the cost per quitter appears to be relatively low.
- They can be run at a community level (as well as a regional and national level).

Nevertheless, 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 not financially disadvantaging contestants, 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 expenditure on tobacco control.

Possible implications for New Zealand: That the health sector continue to explore the use of smoking cessation contests in the New Zealand setting.

7 Smoking cessation strategies appropriate for health care systems and providers

7.1 Provider reminder systems

Background: Reminder systems prompt providers to interact with patients about smoking at every encounter (eg, via chart prompts or stickers, smoking status in “expanded vital signs”, and flow sheets).

Evidence for effectiveness: There is “sufficient evidence” that provider reminder systems when implemented alone are effective in increasing provider delivery of advice to quit (according to the TFCPS and based on seven qualifying studies).

Economic evaluation: The TFCPS identified no relevant studies.

New Zealand evidence: The New Zealand smoking cessation guidelines recommend that primary care providers document the smoking status of every patient (NHC 2002). However, one New Zealand study found that only one-third of GPs asked every adult patient about their smoking status (McLeod et al 2000). There are no published New Zealand studies on enhancing provider reminder systems.

Comments: There is a potential concern with this intervention imposing an extra administrative burden on providers. However, this was not identified as a problem in any of the qualifying studies reviewed by the TFCPS. Also increasing use of computer systems by primary care providers should make it easier to automate reminder systems.

Possible implications for New Zealand: That the health sector continue to develop provider reminder systems (especially where these can be done automatically using practice-based computer systems).

7.2 Provider education only

Background: Provider education involves changing knowledge, attitudes and practices concerning smoking cessation. Relevant techniques include lectures, written materials, videos and continuing medical education seminars.

Evidence for effectiveness: There is “insufficient evidence” for the effectiveness of provider education interventions when implemented alone (according to the TFCPS and based on 16 qualifying studies). The evidence was insufficient because few studies evaluated the effect on smoking cessation and there were inconsistent results.

New Zealand evidence: Various training programmes are available for health providers in New Zealand. Also smoking cessation guidelines (NHC 2002) are distributed to health professionals. However, no published evaluation data of these approaches was identified.

Comments: The lack of evidence in this area is problematic. However, given that many New Zealanders seek advice from health workers on smoking cessation, it would seem that health authorities have some level of duty to inform these workers on what is the best practice with regard to smoking cessation. This would suggest that

some continuing investment in training and in guidelines distribution is probably justified.

Possible implications for New Zealand: That the health sector continue to educate providers on smoking cessation but maximise the use of those techniques which have been shown to be most effective in changing provider behaviour (eg, interactive approaches).

7.3 Provider reminder plus provider education (with or without patient education)

Evidence for effectiveness: There is “strong scientific evidence” for the effectiveness of multicomponent health care system interventions that include a minimum of a provider reminder system and a provider education programme in increasing both provider delivery of advice to quit and patient smoking cessation (according to the TFCPS and based on 20 qualifying studies). This review also reported additional effectiveness where patient education was included (eg, via self-help cessation materials).

New Zealand evidence: In New Zealand, provider reminder systems are in use along with provider education on smoking cessation (see the preceding two sections). However, no published evaluation data of multicomponent approaches was identified.

Comments: Given the evidence from the TFCPS, there would appear to be good grounds for expanding such interventions.

Possible implications for New Zealand: That the health sector continue to develop approaches that combine provider reminders with provider education.

7.4 Provider feedback

Background: Provider feedback interventions use retrospective assessment of provider performance in the identification of smoking status and the delivery of advice to quit. The assessment can be done by chart reviews or the use of computerised records.

Evidence for effectiveness: There is “insufficient evidence” to assess the effectiveness of provider assessment and feedback interventions in increasing either provider delivery of advice to quit or patient smoking cessation (according to the TFCPS and based on three qualifying studies). The evidence is insufficient because the small number of available studies did not provide the necessary outcome data for the evaluation of effectiveness.

New Zealand evidence: No published studies were identified.

Comments: Despite the findings of the TFCPS review, the qualifying studies did show improvements in provider recognition of smoking status.

Possible implications for New Zealand: That the health sector await further evidence before pursuing the expansion of provider feedback interventions.

7.5 Reducing patient out-of-pocket costs for effective smoking cessation treatments

Background: Financial barriers can exist for the use of nicotine replacement therapy (NRT), other pharmacological therapies such as bupropion, and some behavioural therapies.

Evidence for effectiveness: There is “sufficient scientific evidence” that reducing out-of-pocket costs for effective smoking cessation treatments increases both use of the effective therapy and patient smoking cessation (according to the TFCPS and based on five qualifying studies).

Economic evaluation: The TFCPS identified one study that found the adjusted programme costs per quitter ranged from \$US 135 to \$195 (depending on the level of coverage). Also a cost-benefit study found that the intervention was cost-saving when costs and benefits (from averted illness) were compared.

New Zealand evidence: The provision of heavily subsidised NRT by the government resulted in a dramatic increase in the rate of calls to the Quitline in late 2000 and early 2001 [Unpublished Quitline data]. Callers to the Quitline redeemed thousands of “exchange cards” for NRT while still having to pay a charge of \$10 per exchange card. Since 2001 there has also been substantial redemption of exchange cards that have been provided by approved providers in around 250 primary care settings (IPAs, GPs, pharmacists, and Māori health providers).

This experience would strongly suggest that reducing the out-of-pocket price of NRT to those wanting to quit has improved access to NRT in the New Zealand setting. Similarly, the free counselling service provided by the Quitline has itself proved popular and preliminary data indicate it is effective (see section 7.6).

Comments: In addition to the evidence for effectiveness, there is also the argument that smokers should be given some financial support to quit given what they pay in tobacco taxes (of which only a small proportion is used for tobacco control purposes). One New Zealand survey found that 72% of adults supported the provision of fully subsidised smoking cessation programmes (de Zwart and Sellman 2002).

One way in which the funding of the NRT subsidisation programme could be rearranged is if the funds for this programme came from the PHARMAC budget and not from the public health budget. This would make for greater consistency with how other pharmaceuticals are funded. Also, this change would allow for more of the public health budget to be spent on other aspects of tobacco control.

The proven smoking cessation therapy bupropion is currently not subsidised in the New Zealand setting though this is the case in some other countries (eg, the United Kingdom and Australia). Given that NRT is heavily subsidised, the lack of a subsidy for bupropion does appear somewhat anomalous. Nevertheless, the antidepressant nortriptyline can potentially be used for the purposes of smoking cessation (see section 9.6) and this product attracts a full subsidy. It has been reported that PHARMAC supports the use of nortriptyline for this purpose (Arroll 2002).

Possible implications for New Zealand:

- That the health sector continue to support the current subsidisation of counselling and of NRT (via the Quitline, the 250 approved primary care providers and the Aukati Kaipapa programmes).
- That consideration be given to requiring that the NRT subsidisation programme be funded by PHARMAC (rather than from the public health budget).
- That the health sector also explore the subsidisation of bupropion (when prescribed for use as a second-line pharmacotherapy).

7.6 Multicomponent interventions that include patient telephone support

Background: Telephone support can be initiated by the smoker or by the provider. The telephone support component is often combined with other interventions such as patient education materials, use of NRT, and participation in individual or group cessation counselling.

Evidence for effectiveness: There is “strong scientific evidence” that telephone cessation support is effective in increasing smoking cessation when implemented with other interventions (eg, other educational approaches, clinical therapies etc) in both clinical and community settings (according to the TFCPS and based on 32 qualifying studies). The minimum intervention identified in this review with sufficient evidence for effectiveness was proactive telephone support combined with patient cessation materials.

A Cochrane systematic review included 23 randomised controlled trials (RCTs) of telephone counselling for smoking cessation (Stead and Lancaster 2001b). It found that “proactive telephone counselling can be effective compared to an intervention without personal contact. There was heterogeneity between trials so the size of effect is uncertain.”

A meta-analysis in a recent United States guideline also found that proactive telephone counselling for smoking cessation was effective “(Strength of evidence = A)” (Fiore et al 2000). (The “A” level is the highest grading for quality of evidence used in this guideline – based on multiple well-designed RCTs yielding a consistent pattern of findings).

Economic evaluation: The TFCPS identified five relevant economic studies. One reported an adjusted programme cost per quitter of \$US 677. Another study of a nationwide modeled intervention reported an adjusted programme cost per quitter of

\$US 292. Three other studies gave adjusted programme costs per QALY of \$US 73, \$1248, and \$2532.

New Zealand evidence: In New Zealand the Quitline (in conjunction with the Quit/Me Mutu Campaign) appears to have been very effective in attracting callers (with call numbers straining the capacity of the service in late 2000 and early 2001). Preliminary unpublished data also indicate relatively good usage of the Quitline by Māori and increased quit rates (ie, a survey of users found a point prevalence quit rate at three months of 58% (quit for two days or longer) with 49% having been quit for one month or longer (BRC 2001)).

Even episodic media publicity on smoking risks appears to prompt increased call rates to the New Zealand Quitline (Wilson et al 2002a). Calls to the Quitline also continued (albeit at a reduced level) during a time of international security concerns (ie, post 11 September 2001) (Wilson et al 2002b). These findings suggest that the New Zealand Quitline has a fairly high level of acceptability to users.

Comments: The New Zealand Quitline data are consistent with the international data on telephone support being effective smoking cessation interventions. The New Zealand experience is also reassuring with regard to Māori and this is probably because the Quitline has made significant moves to deliver a culturally appropriate service (eg, with Māori quit advisers and having speakers of Te Reo Māori).

Possible implications for New Zealand: That the health sector continue to support the current national Quitline service and support the enhancement of mass media approaches to marketing its services.

8 Smoking cessation interventions for specific populations

8.1 Interventions for pregnant women

Evidence for effectiveness: A Cochrane systematic review of counselling pregnant women for smoking cessation examined 40 trials and pooled data from 30 of these indicated a significant reduction in the odds of continued smoking in late pregnancy (OR=0.51 95% CI = 0.45 to 0.58) (Lumley et al 1999). The absolute difference in the proportion continuing to smoke was 6.6%. Similar results were obtained when only biochemically-validated trials were examined and a better result (9.2% absolute difference) was evident with a high intensity intervention. Trials with information on fetal outcome indicated a significant reduction in low-birth-weight and a non-significant reduction in pre-term birth.

An earlier meta-analysis of nine trials found an overall efficacy of 8% for smoking cessation counselling for pregnant women (Law and Tang 1995). Another meta-analysis of 11 trials also reported that this intervention was effective (Dolan-Mullen et al 1994). The meta-analysis of seven studies conducted for the United States

guideline also found that counselling was effective (Fiore et al 2000). The strength of evidence for this intervention was given an “A” grading.

In terms of NRT for smoking cessation in pregnancy, there is relatively little data on effectiveness. A recent RCT from Denmark (Wisborg et al 2000) found that nicotine patches had no influence on smoking cessation during pregnancy. Nevertheless, the study found that use of the patches was associated with a desirable increase in the birth weight of infants. Possible reasons for the overall lack of success of this RCT include:

- Compliance with the assigned treatment in both groups was very low in this study (for both the nicotine patches and the placebo patches).
- Those who continue to smoke during pregnancy (ie, those who don't quit after the first trimester) are probably a particularly nicotine-dependent group (Selby et al 2001).
- There is some evidence that pregnant women are rapid metabolisers of nicotine (Dempsey et al 2002). This may mean that pregnant women actually have a greater need to consume more cigarettes.

In contrast, one very small unpublished study has reported some success with NRT in achieving smoking cessation in pregnancy (Koren 2001). A workshop in the year 2000 year did not identify any other efficacy studies (Benowitz et al 2000).

There are also new safety concerns regarding the use of NRT in pregnancy. A recent animal study (Cohen et al 2002) found that nicotine disrupts the development of neural circuits that guard against the stopping of breathing during sleep. These findings are very likely to be relevant to how nicotine impacts on the brain of the human fetus (given the similarity of the brain development across mammalian species). Although this study does not discuss different sources of nicotine, the implication is that nicotine from sources other than smoking (eg, from nicotine replacement therapy (NRT)) would also have the same adverse impact in terms of some subsequent increased risk of SIDS.

Economic evaluation: A review of the cost effectiveness of smoking cessation interventions for pregnant women indicated overall cost savings to the health sector in the three studies found (Warner 1997). In the meta-analysis by Dolan-Mullen et al (1994) two trials involved economic evaluations. These gave benefit-cost ratios of 3:1 and from 18:1 to 46:1 with savings being generated per patient who stopped smoking.

More recent United States data indicates that short-term health and economic savings are realised if smoking in pregnancy is reduced (owing to the lower costs from fewer low birth-weight new-borns and perinatal deaths – Lightwood et al 1999). Also of note is a recent study that indicates that pregnant women are particularly sensitive to cigarette price. It was estimated that in the United States a cigarette tax increase of \$US 0.55 per pack would reduce maternal smoking by about 22% (Ringel and Evans 2001).

New Zealand evidence: A range of interventions have been used in the New Zealand setting:

Health professional counselling: There appears to be no published evaluation data on smoking cessation interventions provided by lead maternity carers or on the impact of smoking cessation training for health professionals working with pregnant women (eg, as provided by “Education for Change”).

Community programmes: In New Zealand Aukati Kaipapa programmes have had a particular focus on Māori women who are hapu (pregnant). However, the evaluation data relating to this specific population are not yet available.

Mass media campaigns: The smoking in pregnancy issue was part of the “Hei Aha Te Kai Paipa? –Why Start?” campaign. This relatively low-budget campaign aimed at preventing youth smoking, but had a secondary audience focus of pregnant Māori women smokers. There was use of television, radio and the distribution of some printed health education resources in this campaign. 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.

More recently the “Its About Whanau” mass media campaign has included a television advertisement about being smokefree when hapu (during pregnancy). The evaluation data relating to this campaign are not yet available.

The “SmokeChange Programme”: This is an intensive, personalised intervention for reducing smoking in pregnancy that is “matched to a comprehensive assessment of individual readiness for change and is delivered in homes” (Reardon et al 1999). Published data suggest that this programme is relatively successful with 19% of pregnant women stopping smoking by their last visit (out of those who had at least four visits) (Ford et al 2001). Another 17% reported at least one cessation attempt and there were also reductions in tobacco consumption by those who continued to smoke. Furthermore, changes towards smokefree environments (in homes and cars) were also reported. While these results are encouraging, this particular study of the SmokeChange Programme was somewhat limited in not having a comparison group receiving standard care and in not providing any cost data.

Telephone support: A randomised controlled trial of telephone support for pregnant women in Christchurch found that there was no significant effect on smoking (Bullock et al 1995). Nevertheless, this intervention did have other psychosocial benefits such as reduced anxiety, improved self-esteem, lower stress and improved use of community resources. Such benefits could plausibly assist with increasing the effectiveness of more intensive smoking cessation interventions. It is possible that the current national Quitline could be better promoted towards the needs of pregnant women.

Health education resources: The most up-to-date and detailed smoking cessation resource currently available is the “Quit Book” (distributed by the Quitline service). However, this has little of specific orientation toward pregnant women. The comprehensive resource designed for pregnant women “Your Pregnancy” has some

information on smoking cessation. However, the impact on these particular resources on smoking in pregnancy is unknown.

Comments: There appears to be very good evidence that counselling of pregnant women is effective and that it is a potentially cost saving intervention for the health sector. Yet in New Zealand, the rates of smoking among pregnant women in New Zealand appear to be declining only slowly and continue to be fairly high (ie, 23.0% validated smoking prevalence in the third trimester for Christchurch women – Schluter et al 2002). This is a cause of great concern when considering the adverse impacts on fetal and infant health. Also of note are the data suggesting that health benefits and economic benefits can be achieved from smokefree pregnancies in the short-term.

Some tobacco control mass media campaigns have included material specifically designed for pregnant women (eg, television advertisements in California). Some of these have dealt with misperceptions eg, that low-birth-weight babies mean an easier delivery. However, given that only a very small percentage of smokers are pregnant women smokers, this targeted approach is probably only feasible in a very well resourced (multi-million dollar) campaign. Furthermore, messages for this population need to be very well designed so as not to instil excessive guilt and increase denial.

Although the New Zealand experience with smoking cessation contests is at an early stage (see section 6.4) this intervention could be applied specifically to pregnant women. Also direct financial incentives could be considered to encourage pregnant women to quit. Monetary and non-monetary incentives have been successfully used in the promotion of immunisation (Achat et al 1999).

Possible implications for New Zealand:

- That the health sector continue to strongly promote smoking cessation for pregnant women.
- That the health sector explore the use of smoking cessation contests focused particularly on pregnant women.

8.2 Preoperative smoking cessation interventions

Background: Smokers have been found to have a substantially increased risk of intra and postoperative complications. Furthermore, the preoperative period may be an optimal time to offer smoking cessation interventions since patient motivation to quit may be raised at this time.

Evidence for effectiveness: A Cochrane systematic review found no trials that meet the inclusion criteria (Moller et al 2002). Nevertheless, the reviewers reported that “observational evidence suggests benefits in stopping smoking before surgery”.

New Zealand evidence: No relevant New Zealand studies were identified.

Comments: Despite the lack of direct evidence about which interventions work best in patients preparing for surgery, health professionals could still consider

recommending those behavioural and pharmacological interventions that have been shown to be effective in other settings.

Possible implications for New Zealand: That despite the lack of specific evidence, the health sector should still consider promoting the use of proven smoking cessation techniques in those awaiting surgery (ie, behavioural interventions and pharmacotherapy such as NRT).

8.3 Interventions for hospitalised patients

Evidence for effectiveness: A Cochrane systematic review reported that “intensive intervention (inpatient contact plus follow-up for at least one month) was associated with a significantly higher quit rate compared to control” (Rigotti et al 2002). However, there was insufficient evidence to judge the effect of interventions delivered only during the hospital stay. The review found that the interventions increased quit rates irrespective of whether NRT was used, but the results for NRT were compatible with other data indicating that it increases quit rates.

Economic evaluation: One United States study has identified economic benefits from smoking cessation attributable to preventing hospitalised patients from being re-hospitalised (Lightwood and Glantz 1997). Smoking cessation for pregnant women may also reduce the risk of subsequent episodes of smoking in pregnancy and therefore generate economic benefits from the reduced risk of low weight births (Lightwood et al 1999).

New Zealand evidence: In New Zealand there is a smoking cessation programme called “Quit for our kids” involving nine New Zealand hospitals. It is orientated towards smokers who are caregivers of children in hospital or who are hospital patients themselves. The programme is a brief intervention with support provided and the provision of eight weeks of free NRT. Examination of unpublished evaluation data provided to the Ministry of Health suggest that these programmes are acceptable to users and achieve satisfactory results. There is also good acceptability for Māori with 36% of programme participants self-identifying as Māori (Quit Group 2002b). Also one centre has reported a favourable six month quit rate of 30% and another 34% reported reducing the amount smoked (Taranaki Health 2002).

Comments: A particular advantage of providing smoking cessation to this population is the potential to reduce costs to the health sector from reducing the risk of subsequent hospitalisations.

Possible implications for New Zealand: That the health sector should continue to develop smoking cessation interventions for hospitalised patients.

8.4 Interventions for young people

Evidence for effectiveness: A Cochrane systematic review is currently underway (Panday et al 2002). However, this protocol has reported that school-based smoking cessation programmes that have been trialed in the past achieved low levels of success. This may have been due to these programmes being based on adaptations of adult cessation programmes – which may not adequately address the unique aspects of smoking by young people.

New Zealand evidence: No studies of smoking cessation interventions in young people appear to have been published. However, a New Zealand study is underway on the use of mobile phone text messaging to assist with smoking cessation among young people (Johnston 2002).

Comments: It is biologically plausible that the behavioural techniques and pharmacotherapy proven to be effective in adults will also be effective for young people. However, it is also plausible that effectiveness will be lower given that motivation to quit is probably usually lower (eg, given the peer pressure to continue to smoke). This would suggest that investing in smoking cessation for adults is probably likely to be more cost-effective.

If smoking cessation interventions for young people were to be trialed in New Zealand, there is an argument for focusing on young women. This is because:

- This is the population who can become pregnant with the resultant adverse effects on fetal and infant health if maternal smoking occurs.
- Young women are generally more concerned about health issues than men.
- Young women may be under more financial pressure to quit (given that young men have higher average earnings).
- They are probably more likely to quit (eg, New Zealand Quitline data indicate that women have nearly double the call rate to the Quitline that men do (Olliver-Richardson 2002)).

Possible implications for New Zealand:

- That the health sector should await further evidence from international studies before investing substantially in interventions specifically for smoking cessation among young people.
- That any interventions in the New Zealand setting are piloted and carefully evaluated.
- That the priority audience for any such interventions in New Zealand be young women.

8.5 Interventions of particular relevance to Pacific peoples

Background: Pacific peoples have relatively high smoking rates. Also they are more likely to suffer from the financial burdens imposed by dependency on tobacco given their lower than average incomes. Although there are two smoking cessation programmes for Pacific peoples that have commenced in New Zealand – no evaluation data has yet been published.

This section reviews church-based smoking cessation on the basis that Pacific peoples have relatively high church attendance rates. The role of the kava is also examined as this traditional product is used to some extent by Pacific peoples in New Zealand.

Evidence for effectiveness:

Church-based interventions: One study of a church-based smoking cessation intervention for rural African Americans showed a reduction in smoking prevalence at 18 months relative to those in a control county – though this result was not statistically significant (Schorling et al 1997). Another United States study reported that attendance at religious services might assist with smoking cessation (Strawbridge et al 1997). Frequent church attendees had significantly higher smoking cessation rates (nearly double) and lower mortality rates than infrequent attendees.

A review of smoking cessation programmes for African Americans considered that “church-based programs may provide an effective location for cessation interventions, but the studies to date did not demonstrate unequivocal effectiveness” (Pederson et al 2000). The building of trust and acceptance and provision of technical support have been found to be important with these church-based programmes (Stillman et al 1993).

A study of Lumbee Indians in North Carolina (United States) found that current smokers who had not attended church in the past year smoked significantly more cigarettes per day than current smokers attending church more often (Spangler et al 1998). Furthermore, participants attending church weekly or more often were 73% less likely to be current smokers and among ever-smokers, participants having attended church infrequently in the past year were 79% less likely to have quit. The authors of this study considered that these results “should be useful in designing a church-based tobacco-cessation intervention among Lumbee Indians”.

Kava for smoking cessation: Among Pacific peoples the kava ceremony has been used to facilitate smoking cessation in Fiji (Groth-Marnat et al 1996) and 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 is effective in reducing anxiety (Pittler and Ernst 2002). However, there have been recent concerns raised by the Food and Drug Administration in the United States about the safety of kava. Indeed, the risks associated with kava misuse have resulted in kava importation to Australia being banned in 1998 (due to adverse impacts on Aboriginal communities).

New Zealand evidence: There are no published studies on tobacco control interventions specifically for a Pacific peoples audience.

Comments: The scientific evidence for church-based smoking cessation is still fairly limited. Nevertheless, a potential benefit for Pacific peoples is plausible given the importance of the church in daily life. Also Pacific churches in New Zealand have historically played a role in other public health interventions such as mass immunisation campaigns (eg, for controlling meningococcal disease (type A) in Auckland).

It is plausible that kava may play a role in facilitating smoking cessation given its traditional status and also its probable anxiety-reducing effects. Nevertheless, it would be prudent for health authorities to further consider concerns over the safety of kava before it is evaluated further for smoking cessation.

Possible implications for New Zealand: That the health sector gives consideration to pilot programmes involving church-based smoking cessation for Pacific peoples.

9 Other smoking cessation interventions (not reviewed by the TFCPS)

9.1 Smoking cessation counselling

Evidence for effectiveness: A Cochrane systematic review of 16 RCTs found that simple advice from doctors had a small but significant effect on cessation rates (odds ratio (OR) for quitting = 1.69, 95% CI = 1.45 to 1.98) (Silagy and Stead 2001). There was a small advantage of intensive advice over minimal advice (OR = 1.44, 95% CI = 1.23 to 1.68).

A review by the National Health Service in the United Kingdom considered that brief advice from health professionals (taking around 3 minutes) decreased the proportion of people smoking by around 2% (NHSCR 1998). Increasing the intensity of the advice (time spent giving advice and the duration of follow-up) improved the effectiveness (ie, decreasing the proportion of smoking by around 3-5%).

The results of a meta-analysis of RCTs in a recent United States guideline, strongly supports the value of counselling for smoking cessation by physicians (Fiore et al 2000). This work showed that there is a strong dose-response relation between the session length of person-to-person contact and successful treatment outcomes. “Intensive interventions are more effective than less intensive interventions and should be used whenever possible (Strength of evidence = A)”. Contact times of over 10 minutes are significantly more effective than those lasting 3-10 minutes. Also, having treatment lasting more than eight contact sessions is significantly more effective than two or three sessions (again based on a meta-analysis). Furthermore, treatments delivered by non-physician clinicians (eg, psychologist, nurse, dentist, and counsellor) are also effective according to a meta-analysis in this guideline (Fiore et al 2000).

With regard to ethnic issues, the United States guideline (Fiore et al 2000) has stated that: “Smoking cessation treatments have been shown to be effective across different racial and ethnic minorities [African Americans, American Indians/Alaska Natives, Asians and Pacific Islanders, Hispanics]. Therefore, members of racial and ethnic minorities should be provided treatments shown to be effective in this guideline. (Strength of evidence = A).” This guideline also notes that “whenever possible, tobacco dependence treatments should be modified or tailored to be appropriate for

the ethnic or racial population with which they are used. (Strength of evidence = C).” (The “C” level equates to evidence where the United States guideline panel achieved consensus on the recommendation in the absence of relevant RCTs).

A Cochrane systematic review has specifically examined 16 RCTs of nursing interventions for smoking cessation (Rice and Stead 2002). The review reported that there was “reasonable evidence” that the provision of smoking cessation advice and counseling given by nurses to their patients can be effective. The review found “limited evidence” that interventions were more effective for hospital inpatients with cardiovascular disease than for inpatients with other conditions.

New Zealand evidence: There have been no specific trials of smoking cessation counselling in the New Zealand setting. However, the successful experience with the Quitline (which involves counselling delivered by telephone) is consistent with the international data (see section 7.6). Also some evaluation data from the Isis programme is suggestive of effectiveness (with the quit rate at one year being reported as 33%) (Brown et al 1999).

Comments: The international evidence for smoking cessation counselling being effective is overwhelming. The New Zealand data are limited, but are consistent with the international evidence.

Possible implications for New Zealand: That the health sector continues to promote the use of counselling by health workers in primary and secondary care settings and via the national Quitline. Consideration could be given to providing specific financial incentives for primary care providers who provide smoking cessation interventions.

9.2 Group counselling for smoking cessation

Evidence for effectiveness: A Cochrane systematic review identified 13 RCTs that compared a group programme with a self-help programme (Stead and Lancaster 2001a). The meta-analysis found that there was an increase in cessation with the use of a group programme (OR = 2.10, 95% CI = 1.64 to 2.70). Group programmes were more effective than no intervention or minimal contact interventions (OR = 1.91, 95% CI = 1.20 to 3.04). However, the authors found that there was no evidence from two trials that group therapy was more effective than a similar intensity of individual counselling.

A meta-analysis in a United States guideline also found that group counselling for smoking cessation was effective “(Strength of evidence = A)” (Fiore et al 2000).

New Zealand evidence: Group counselling has been used in some Aukati Kaipapa programmes but the evaluation study of these programmes is not yet complete.

Comments: Given economy of scale issues there may be particular advantages in terms of cost-effectiveness of the use of group counselling over individual counselling. However, it is important to recognise that group participation does not have high levels of acceptability for some individuals.

Possible implications for New Zealand: That the health sector continues to promote group counselling approaches given its potential cost-effectiveness.

9.3 Use of, and access to, nicotine replacement therapy (NRT)

Background: This section considers the use of NRT for smoking cessation. It should be considered in conjunction with the section on reducing financial barriers to cessation interventions (see section 7.5).

Evidence for effectiveness: The most recent meta-analysis identified (Stead et al 2001) confirmed the findings of a previous Cochrane meta-analysis indicating that nicotine gum was effective. This work also updated a meta-analysis of 30 trials of using nicotine patches (giving a meta-analytic effect of 1.73 (95% CI = 1.56 – 1.93)).

The effectiveness of NRT was also found in a recent meta-analysis by Fiore et al (2000). Similarly, the National Institute for Clinical Excellence recommends NRT for smoking cessation (NICE 2002).

Despite the evidence from RCTs there is some evidence that the use of NRT in the community may have little impact on long-term quit rates (Pierce and Gilpin 2002). But this Californian experience was in the context of a lack of adherence to recommended guidelines for use of NRT and lack of supportive counselling.

Economic evaluation: A review by Warner (1997) considered that NRT was a very cost effective intervention even though it was more costly than less resource-intensive smoking cessation interventions (eg, distribution of self-help cessation guides). Other reviews in the United Kingdom have also considered NRT to be a relatively cost-effective intervention (NHSCRD 1998a; NHSCRD 1998b). The most recent systematic review reported that adding NRT to current practice is cost-effective with a relatively low (under £1000) incremental cost per quitter (with 1.0 to 3.0 life years saved per quitter) (Woolacott et al 2002). This review also undertook modelling work which estimated an incremental cost per life-year saved as being £1000-2400 for NRT. The results of various cost-effectiveness analyses identified in a Medline search are detailed in the table below.

Table 4: Published cost-effectiveness studies on NRT

Type of intervention	Cost per life years / QALYs* saved (\$US) (or other measure as stated)	Reference
Nicotine gum as an adjunct to counselling (US)	Men: \$4113 to \$6465 Women: \$6880 to \$9473	Oster et al 1986
Nicotine patch for 12 weeks relative to counselling alone (UK)	£4526 per YLS (£1252 per quitter) (incremental cost-effectiveness)	Akehurst and Piercy 1994a
Nicotine nasal spray for 6 months + intensive group clinic (UK)	£1430 per YLS (with costs to the NHS in the range of: -£24 to £881 per YLS).	Akehurst and Piercy 1994b
Nicotine patch as adjunct to counselling (US)	Men: \$4390 to \$10 943 (QALY) Women: \$4955 to \$6983 (QALY) (Incremental cost-effectiveness compared to just counselling)**. Gum was half as cost-effective as patches.	Fiscella and Franks 1996
Nicotine patch with behavioural modification (military personnel) (US)	Cost per quitter of \$779 (at 6 months). (Assuming a saving of 8 years of life per smoker this gives an undiscounted cost per YLS of only \$97).	Miller et al 1996
Nicotine patch as adjunct to counselling (RCT in the UK)	Men: £1742 to £2930 (YLS) Women: £2948 to £4258 (YLS)	Lowin 1996
Counselling +/- nicotine patches or gum (US)	\$1108 to \$4542 (QALY)	Cromwell et al 1997
Individualised treatment plan (including counselling, patches or gum, group therapy, in-patient programme) (US)	\$1094 to 6828 per YLS (0 to 5% discount rate) (specific costs for NRT not isolated)	Croghan et al 1997
Nicotine patch as adjunct to counselling (US)	Men: \$965 to \$1585 per YLS Women: \$1634 to \$2360 per YLS (incremental cost-effectiveness compared to just counselling)	Wasley et al 1997
Programme using counselling + gum / patches (fully covered)	\$883 per YLS (using the same assumptions by Oster et al)	Curry et al 1998
NRT in addition to brief advice and self-help materials (UK)	£4199 per year of life saved (incremental cost-effectiveness) (1.5% discount rate, societal perspective)	Parrott et al 1998
Nicotine patch for 12 weeks relative to GP counselling alone (UK)	£398-785 per year of life saved (incremental cost-effectiveness) (1.75% discount rate)	Stapleton et al 1999
NRT – publicly provided with 25% coverage (for high income countries)	\$746 to \$1160 [DALY – disability adjusted life year]	Jha and Chaloupka 1999

Notes:

* US work suggests that there is little difference between life years saved and QALYs saved to measure the health benefits of smoking cessation (this suggests that comparisons between these estimates are valid (Cromwell et al 1997)).

** Cost-effectiveness was improved by 25% by limiting prescription renewals to patients successfully abstaining for the first 2 weeks.

YLS = Years of life saved

Cost-effectiveness in the New Zealand setting: A simplistic cost-effectiveness analysis on the use of NRT in the New Zealand setting has been undertaken from both a consumer and health funder perspective as part of a comparative assessment with the use of bupropion for smoking cessation (Wilson 2000). It found that nicotine patches (delivered via the Quitline) were more cost-effective than bupropion from both consumer and health funder perspectives in all age groups. For example, from a health funder perspective (and at a 10% discount rate) the cost-effectiveness was \$7500 per year of life saved using nicotine patches versus \$11 600 for bupropion provided to a 45-year-old (and \$1500 vs \$2300 respectively for a 65-year-old). Nevertheless, the use of bupropion and NRT are not mutually exclusive and bupropion might be the best choice for people who have failed to quit with NRT (both products can also be used simultaneously).

New Zealand evidence: In New Zealand, a number of Autaki Kaipaipa pilot programmes for smoking cessation among Māori women have included the use of NRT and counselling in a culturally appropriate setting (Dowden et al 2000). Unpublished evaluation data prepared for the Ministry of Health suggests substantially higher quit rates from programme participants than a control group in the community.

As detailed in the section on reducing out-of-pocket expenses (section 7.5), there has been extensive use of NRT by the New Zealand public in recent years. The evaluation work on NRT distribution via the Quitline is not yet complete but use of NRT (in conjunction with contact with the Quitline) is associated with relatively good quit rates according to preliminary survey data (ie, 49% having been quit for one month or longer (BRC 2001)). There have been no serious problems reported with making NRT readily available through the Quitline or through a range of primary care providers.

Preliminary data from quit and win contests in New Zealand has found that the use of NRT was associated with higher quit rates among contestants compared to those not using NRT (Milne 2002).

Comments: The international evidence for the effectiveness of NRT for smoking cessation is very strong. The New Zealand data are more limited but are consistent with the international evidence. It would also appear that this is a relatively cost-effective intervention (when compared with other health sector interventions such as recent investment decisions by PHARMAC on pharmaceuticals (Metcalf et al in press)). Furthermore, there are certainly very high levels of public interest in this particular smoking cessation intervention.

Possible implications for New Zealand: That the health sector continue to support the use of NRT for smoking cessation and the use of the current subsidy to make it more accessible. However, if funding becomes more limited then tighter criteria could be

used (eg, limiting access to those smoking 15+ cigarettes per day and possibly for those aged 25+ years). Even tighter criteria could involve restricting access to those with an existing chronic illness (eg, asthma, chronic obstructive pulmonary disease or diabetes).

9.4 Enhancing partner support to improve smoking cessation

Evidence for effectiveness: A Cochrane systematic review examined relevant nine trials that meet their inclusion criteria (Park et al 2002). It concluded that interventions designed to enhance partner support for smokers in cessation programmes “did not increase quit rates”. Furthermore, this review reported that “limited data from several of the RCTs suggest that these interventions did not increase partner support either”. The reviewers considered that if partner support were part of an existing cessation programme, then there is a need to deliver more systematic intervention to influence partner support more significantly.

New Zealand evidence: Aspects of partner support have been used in the Aukati Kaipapa programmes but evaluation data on this aspect have not been published. However, preliminary data from quit and win contests indicates that where the person identified that the nominated support person was “important” the quit rates were higher (Milne 2002).

Comments: The evidence suggesting that this approach is ineffective is somewhat surprising but may partly reflect methodological issues with the available studies.

Possible implications for New Zealand: That the health sector should await further evidence before investing substantially in partner support interventions.

9.5 Physical activity interventions for smoking cessation

Evidence for effectiveness: A Cochrane systematic review included eight trials (Ussher et al 2002). It found that only one trial showed a significant benefit from the exercise programme at long term follow-up. A second trial showed a significant benefit at three months only (but this trial had numerous methodological limitations). All the other trials were considered too small to exclude reliably an effect of the intervention. The reviewers considered that there is a need for trials with larger sample sizes and a number of other methodological improvements.

Furthermore, a recent review of controlled trials by the United States Preventive Services Task Force concluded that “evidence is inconclusive that counseling adults in the primary care setting to increase physical activity is effective” (Eden et al 2002).

New Zealand evidence: No specific studies on physical activity for smoking cessation were identified. However, there is some New Zealand evidence relating to the effectiveness of “green prescriptions” for promoting physical activity.

Comments: Despite the limited evidence from RCTs, there are reasonable theoretical grounds for considering that physical activity may assist with smoking cessation:

- It may moderate the effects of nicotine withdrawal (eg, by lowering anxiety levels).
- It may improve levels of self-efficacy and so assist with the confidence required to sustain a quit attempt.
- It may assist with minimising the weight gain that is generally associated with smoking cessation (and hence reduce the risk of relapse among those individuals who are particularly concerned with weight gain).

There are also additional reasons to promote physical activity given that it has many proven health benefits. However, a potential concern is if promoting too much lifestyle change at the same time (ie, both smoking cessation and increasing physical activity) results in less sustainable long-term behaviour change.

These issues suggest that there is a need for more data but that in the meantime there may be a case for physical activity promotion for those who appear to be highly motivated.

Possible implications for New Zealand:

- That the health sector await further evaluation studies before putting significant resources into promoting physical activity as a smoking cessation intervention.
- That health workers still consider promoting physical activity as a supplementary smoking cessation measure among those who are highly motivated to quit.

9.6 Bupropion and nortriptyline for smoking cessation

Evidence for effectiveness: A Cochrane review has examined RCTs on the use of antidepressants for smoking cessation (Hughes et al – updated in 1999). It found that there was one trial each of the antidepressants fluoxetine and moclobemide, two of nortriptyline, and four trials of bupropion. The review reported that “Nortriptyline and bupropion increased cessation and other antidepressants might also be effective. One trial found combined bupropion and nicotine patch produced higher quit rates than patch alone.” The Cochrane review concluded that: “Some antidepressants (bupropion and nortriptyline) can aid smoking cessation. It is not clear whether these effects are specific for individual drugs, or a class effect.”

Similarly, the United States Guidelines considered that the strength of evidence for the effectiveness bupropion was good “(Strength of evidence = A)” (Fiore et al 2000). For nortriptyline the strength of evidence for effectiveness was not as strong “(Strength of evidence = B)”. These guidelines recommended bupropion for first-line pharmacotherapy alongside NRT, while nortriptyline was recommended as a second-line pharmacotherapy.

Based on the results of a meta-analysis of 10 RCTs, the National Institute for Clinical Excellence in the United Kingdom recommends bupropion for smoking cessation (NICE 2002). Since these reviews, another RCT has found that sustained-release bupropion was effective for smoking cessation among African Americans (Ahluwalia et al 2002).

Economic evaluation: This review identified a Glaxo Wellcome cost-benefit study that used a decision-tree analysis, based on a previously published cost-benefit smoking-cessation model (Nielsen and Fiore 2000). This analysis took an employer's perspective of costs versus benefits and used one-year follow-up data from the study by Jorenby et al (1999): "The analysis showed that bupropion was more cost-beneficial than either NTP [nicotine patch] or bupropion/NTP, with a net benefit in the first post-quit year of up to \$338 per employee who attempts to quit compared with \$26 for NTP, \$178 for the two in combination, and \$258 for placebo.

Modelling work as part of a systematic review has estimated that the incremental cost per life-year saved from using bupropion (SR-slow release) was £640 – 1500 (Woolacott et al 2002). When combined with NRT the cost per life-year saved was £900 – 2000.

A simplistic cost-effectiveness analysis on the use of bupropion in the New Zealand setting has been undertaken from both a consumer and health funder perspective (Wilson 2000). It found that bupropion is a relatively good investment for middle aged and older adults (eg, saving a year of life for a 45-year and 65-year-old for \$11 600 and \$2300 respectively from a health funder perspective at a 10% discount rate). At a 5% discount rate, the respective values were even better at \$2000 and \$900 respectively.

For a number of reasons, these results probably under-estimate the true cost-effectiveness of bupropion and its cost-effectiveness would probably be substantially greater if it was used at the 150 mg daily dose (versus the 300 mg dose recommended by the manufacturer). In contrast, nicotine patches (delivered via the Quitline) were found to be more cost-effective than bupropion from both consumer and health funder perspectives in all age groups. For example, from a health funder perspective (and at a 10% discount rate) the cost-effectiveness was \$7500 per year of life saved using nicotine patches versus \$11 600 for bupropion provided to a 45-year-old (and \$1500 vs \$2300 respectively for a 65-year-old). Nevertheless, the use of bupropion and NRT are not mutually exclusive and bupropion might be the best choice for people who have failed to quit with NRT (both products can also be used simultaneously).

It is also likely that the nortriptyline is more cost-effective for smoking cessation than bupropion given its very much lower cost. However, nortriptyline has a poorer safety profile and therefore probably poorer acceptability by users.

Despite bupropion being a relatively good investment for *personal health* funding, it is unlikely to be as cost-effective as *population health* tobacco control interventions. That is, it is likely to be a poorer investment than increasing tobacco tax, funding mass media campaigns, organising smoking cessation contests and providing smoking cessation advice for pregnant women.

New Zealand evidence: Although the manufacturer promotes bupropion in New Zealand, there are no published studies on the extent of its use and on its effectiveness in the New Zealand setting. One hospital based smoking cessation programme has used fully subsidised bupropion for some clients, but quit rate data have not been reported on (Taranaki Health 2002).

Comments: In New Zealand, bupropion is recommended by the Medicines Adverse Reactions Committee (MARC) as a second-line pharmacotherapy (NHC 2002). Nortriptyline is not registered for use as a smoking cessation adjunct but it can still be prescribed by doctors for this purpose under Section 25 of the Medicines Act 1981. The New Zealand smoking cessation guidelines note that as nortriptyline is fully subsidised, it should be considered as “a second-line agent, in particular for people who cannot afford bupropion”.

Possible implications for New Zealand: That the health sector continue to promote the use of bupropion as a second-line pharmacotherapy (eg, by making it available in a fully subsidised form). Consideration could be given to research on enhancing the use of nortriptyline in the New Zealand setting.

9.7 Self-help smoking cessation resources

Evidence for effectiveness: A Cochrane systematic review has been conducted on self-help interventions for smoking cessation (ie, manuals, leaflets, videotapes and audiotapes) (Lancaster and Stead 1998). This review found that self-help manuals significantly increased quitting by 20% when compared to no intervention (results from seven RCTs). But compared to brief therapist contact or provision of NRT there was no additional benefit from self-help materials. Also, the trial that used a video (combined with NRT) found no additional benefit from the video.

Two other reviews, that included written materials as a public education smoking cessation intervention, found small but significant effects on long-term cessation (Glynn et al 1990; Kottke et al 1988).

New Zealand evidence: In New Zealand many tobacco control related resources are available from the national collection of health education resources and from local public health units and NGOs (Wilson and Maling 1999). However, specific evaluation studies have not been published. Anecdotal reports do indicate user acceptability of the “Quit Book” [Personal communication, Helen Glasgow, Quit Group].

Comments: Since many people who quit smoking do not seek support from health workers, there would appear to be a need for self-help materials.

Possible implications for New Zealand: That the health sector continue to develop and distribute (free of charge) self-help smoking cessation resources. Ideally these resources should all be subject to evaluation (as per the established Ministry of Health guidelines).

9.8 Alcohol tax increases to reduce tobacco consumption?

Evidence for effectiveness: There may be interactions between expenditure on tobacco and alcohol that suggest that taxation of alcohol can potentially reduce tobacco consumption. Data from Spain supports this contention (Jimenez and Labeaga 1994). Furthermore, there does appear to be some relationship between smoking and alcohol use. In terms of cessation, there is some evidence that current use of alcohol and/or current alcohol abuse impedes success with smoking cessation (Sherman et al 1996). Also United States data indicate that men who quit smoking reduce their daily alcohol consumption (Picone and Sloan 2002).

New Zealand evidence: No relevant New Zealand data have been published. The historical record is complicated by excise tax increases for tobacco and alcohol often occurring at the same time.

Comments: Some impact from alcohol tax on tobacco consumption in the New Zealand context is quite plausible since those purchasing more expensive alcohol would have reduced available discretionary capacity for other legal and illegal drugs. There is certainly a compelling case for increased alcohol taxes on other public health grounds (as recently reviewed by Chaloupka et al 2002). Further research in this area would probably be desirable, particularly around the time of any significant increase in the level of alcohol tax (eg, at budget time).

Possible implications for New Zealand: That the health sector should consider the potential impact of alcohol tax increases on tobacco consumption when advocating for any further increases in alcohol taxes. It is recognised, however, that the primary issue associated with the appropriate level of alcohol taxation is to balance the harms to public health and society from alcohol use with the benefits (ie, the potential health benefits relating to cardiovascular disease prevention and also the enjoyment of alcohol use by much of the population).

9.9 Hypnotherapy for smoking cessation

Background: There is some private sector provision of hypnotherapy for smoking cessation in New Zealand and some public smoking cessation programmes also use it (eg, some Aukati Kaipapa programmes).

Evidence for effectiveness: In a meta-analysis of the 10 RCTs on hypnotherapy and smoking cessation the combined estimate of efficacy was 23% ($P < 0.001$) (Law and Tang 1995). However, since no trials measured biochemical markers of tobacco smoke intake to confirm verbal claims, the authors of the review considered this intervention to be unproven. One RCT published since this meta-analysis showed no benefit of hypnotherapy for smoking cessation among pregnant women (Valbo and Eide 1996).

A Cochrane systematic review (last updated in 2001) considered nine RCTs of hypnotherapy (Abbot et al 2002). It found that there was significant heterogeneity between the results of the studies and that there was “conflicting results for the effectiveness of hypnotherapy”. Furthermore, “there was no evidence of an effect of

hypnotherapy compared to rapid smoking or psychological treatment”. The authors concluded that “we have not shown that hypnotherapy has a greater effect on six month quit rates than other interventions or no treatment”.

New Zealand evidence: No relevant studies were identified.

Comments: There is still uncertainty regarding the effectiveness of hypnotherapy being effective for smoking cessation according to the best available review (ie, the latest Cochrane review). Also even if it has some benefit, it might not be as cost-effective as the provision of advice and use of NRT, due to its relatively high cost. However, this may not be the case where the cost is reduced by limiting treatment to just one session.

Another concern with hypnotherapy is that not all the population can be readily hypnotised and also the level of acceptability in the general population may not be very high. Nevertheless, hypnotherapy may have advantages in certain settings (eg, it has been used to support workplace-smoking bans (Sorenson et al 1995)). It may also be of particular relevance to treating population groups for whom NRT is less acceptable (ie, pregnant women).

Possible implications for New Zealand: That the health sector should focus on those smoking cessation interventions where there is much stronger evidence for effectiveness than that for hypnotherapy (eg, counselling and NRT). Nevertheless, there may be a case for considering further research on hypnotherapy for smoking cessation for populations in which NRT is not usually suitable (eg, pregnant women).

9.10 Acupuncture for smoking cessation

Background: Acupuncture has become increasingly popular amongst primary care providers in New Zealand in the last decade. Some Aukati Kaipapa programmes have reportedly used this therapy (along with other smoking cessation interventions).

Evidence for effectiveness: A Cochrane systematic review (which was updated in 2002) identified 22 relevant studies (White et al 2002). It found that acupuncture was not superior to sham acupuncture in smoking cessation at any time point (including after 12 months). Also when acupuncture was compared with other anti-smoking interventions there were no differences in outcome (again at any time point). Although acupuncture “appeared to be superior to no intervention in the early results” this difference was not sustained. Furthermore, the results with different acupuncture techniques did not show that any one particular method was superior to the control intervention (eg, auricular acupuncture or non-auricular acupuncture). However, based on the results of single studies, acupressure was found to be superior to providing just advice. Overall however, the authors concluded that “there is no clear evidence that acupuncture, acupressure, laser therapy or electrostimulation are effective for smoking cessation”.

New Zealand evidence: No relevant studies were identified.

Comments: There is probably enough evidence to suggest that acupuncture is fairly unlikely to assist in smoking cessation. The evidence relating to other drug dependency disorders is less substantive but also not very encouraging. For example, although one RCT of acupuncture and alcoholism reported statistically significant benefits (Bullock et al 1989), other RCTs have found no significant impact on drinking behaviour (Sapir-Weise et al 1999; Worner et al 1992).

Possible implications for New Zealand: That smoking cessation providers are informed of the lack of evidence for the use of acupuncture for smoking cessation.

10 Reducing exposure to second-hand smoke

10.1 Smoking bans and restrictions

Background (international risk data): The International Agency for Research on Cancer (IARC) has recently declared that “second-hand tobacco smoke is carcinogenic to humans” and that “even the typical levels of passive exposure have been shown to cause lung cancer among never smokers” (IARC 2002a; 2002b). Prior to this assessment there was strong evidence that second-hand smoke (SHS) is a cause of lung cancer from published meta-analyses (Hackshaw et al 1997; Taylor et al 2001). The United States Surgeon General (USDHHS 1986) and the United States National Research Council (NRC 1986) also came to this conclusion. A number of major reviews have also reported that exposure to SHS is associated with heart disease in adults (WHO 1999) or is causal of heart disease in adults (California EPA 1997; SCTH 1998). Major reviews have also reported that there is a causal association between SHS exposure and the risk of respiratory illness (USEPA 1992; California EPA 1997; SCTH 1998). A causal association between SHS exposure and increased severity of asthma episodes and symptoms has also been reported by major reviews (USDHHS 1986; USEPA 1992; SCTH 1998).

Background (New Zealand risk data): In New Zealand the Smoke-free Environment Act (1990) effectively banned smoking in offices, but not in many other interior workplaces (NZ Government 1990). The studies listed below provide evidence that exposure to SHS is a continuing problem in a number of workplace settings:

- A study that included data from workers in a nationwide multi-industry corporation in 1992/93 found that exposure to SHS in the workers averaged 47 minutes per week (for the total of work and home exposure) (Whitlock et al 1998).
- A 1996 survey found 34% of indoor workers exposed to SHS at lunch and tea breaks, and 17% exposed to SHS in the workplace at other times. Māori and blue-collar workers were over 60% more likely to be exposed to SHS in the workplace than others (28% and 29% respectively were exposed) (NRB 1996).
- A survey in 1999-2000 indicated that 59% of hospitality workers were exposed to SHS (Jones et al 2001). More than half of the exposed workers reported irritation to their throat or lungs from SHS.

- A study reported on hair nicotine levels amongst workers in the hospitality industry (Al-Delaimy et al 2001). It found that the exposure level was substantial, with hair nicotine levels among non-smokers working in places with no restriction on smoking being similar to hair nicotine levels of active smokers.
- Another study examined the concentrations of salivary cotinine (a marker for tobacco smoke exposure) found in hospitality workers (Bates et al 2002). It reported that the levels of cotinine found in non-smoking workers exposed to SHS “have been associated with substantial involuntary risks for cancer and heart disease”. Furthermore, workers in premises permitting customer smoking reported a higher prevalence of respiratory and irritation symptoms than workers in smokefree workplaces.

Overall burden of harm: SHS exposure in New Zealand workplace settings has been estimated to cause 101 avoidable deaths per year from lung cancer, coronary heart disease and stroke collectively (Woodward and Laugesen 2001a). This is 29% of the estimated total of all deaths attributable to SHS in New Zealand (estimated to be in the range of 174 to 490 deaths per year). However, this was a conservative estimate that did not include the exposure of workers to SHS at lunch and tea breaks, or the effect of SHS on smokers. The SHS exposure at work was also estimated to cause 190 hospital admissions for heart attacks annually, as well as contributing to illness from strokes and other causes (Woodward and Laugesen 2001b). There is also evidence from a New Zealand study that total SHS exposure (from work and home) contributes to the risk of stroke (Bonita et al 1999).

Evidence for effectiveness: “Strong scientific evidence” exists that smoking bans and restrictions reduce exposure to SHS in the workplace according to the TFCPS (based on 10 qualifying studies). This review also concluded that such interventions appear to have an effect on tobacco consumption and cessation.

A Cochrane systematic review of 11 trials (Serra et al 2001) and a meta-analysis of 19 studies (Chapman et al 1999) have also reported that interventions to reduce smoking in public places are effective.

Economic evaluation: The TFCPS identified a well designed United States study that estimated the net present benefit to society of a national smokefree environment act covering all nonresidential buildings. The benefit was calculated as being in the range of \$US 42 to 78 billion.

New Zealand evidence: There are a number of studies that indicate that smokefree environments restrictions can be effective in the New Zealand setting. These have been recently detailed in a published review (Wilson and Thomson 2002) but the key aspects are summarised below:

- Legislation for smoke-free workplaces (Smoke-free Environments Act 1990) appears to have been highly effective in reducing exposure to tobacco smoke according to survey data commissioned by the Department of Health after the Act was passed (Brander 1992). Subsequent survey data also showed that the proportion of workers exposed to tobacco smoke during working hours decreased from 28% in 1989 to 17% in 1996 (NRB 1996).
- A study found that non-smoking workers working in 100% smoke free restaurants had much lower hair nicotine levels than staff working in bars with no restrictions

on smoking (with levels being intermediate for staff working in places with a partial smoking ban) ($p < 0.0001$) (Al-Delaimy et al 2001).

- A study found that hospitality workers in premises allowing smoking by customers had significantly greater increases in salivary cotinine than workers in smokefree premises (Bates et al 2002). Workers in premises with no restrictions on customer smoking were more highly exposed to SHS than were workers in premises permitting smoking only in designated areas.

Comments: The New Zealand evidence appears to be consistent with the international evidence that restrictions on smoking are an effective tobacco control intervention. There is currently draft legislation before the New Zealand Parliament to extend the scope of smokefree workplaces (and possibly to make all bars and restaurants smokefree). To maximise the impact of any new legislation, the government and health authorities could consider various supplementary options:

- Funding mass media campaigns (beyond the 2002 year) to further educate workers and the public about the hazards of SHS in the workplace. This would facilitate both self-enforcement and easier enforcement of new legislation. In particular, it could help inform members of the New Zealand hospitality industry. Some in this industry have indicated concerns about the effects of any legislation to ban smoking in pubs (Reeder and Blair 2000).
- Addressing information disseminated by the tobacco industry (the limitations of which have been documented in a recent New Zealand review by Thomson and Wilson 2000).
- Supporting employers with workplace efforts to support smoking cessation interventions for their staff (eg, encouraging use of the Quitline and providing financial support for smoking cessation).
- Regular (at least annual) monitoring of the exposure of workers to SHS, as well as monitoring the attitudes to and knowledge of the effects of SHS by workers and the public (see the objective relating to surveillance).
- Possibly conducting research on the economic impacts of the legislation on sales by bars (since this information was useful in California (Hallett 2002)). However, it is important to recognise that it is the health benefits and the right for workers not to be exposed to carcinogens that are the major concerns at the population level (and not the economic impacts to selected retailers).
- Improving tobacco control in general (eg, with greater use of mass media campaigns, publicity for the Quitline, and quit and win contests).

Possible implications for New Zealand: That the health sector strongly supports smoking bans and restrictions (particularly in terms of enacting and enforcing the current draft legislation before the New Zealand Parliament).

10.2 Community education to reduce exposure to SHS in the home

Background: A Cochrane protocol has noted that the consequences for children who are exposed to second-hand smoke (SHS) have been extensively documented and include sudden infant death syndrome (SIDS), bronchial hyper-responsiveness, atopy, asthma, acute and lower respiratory disease, reduced lung function and middle ear

disease (Waters et al 2002). These authors also reported that there is evidence that children whose parents smoke are more likely to smoke themselves later in their lives.

Awareness of these hazards in the community is far from complete. One study of Pacific mothers in New Zealand has found that only 32% knew that maternal smoking was a risk factor for SIDS (Paterson et al 2002).

Evidence for effectiveness: According to the TFCPS the evidence for community education to reduce exposure to SHS in the home is “insufficient”. This is because of the small number of available studies and limitations in the design and execution of these studies.

A Cochrane systematic review on “family and carer smoking control programmes” for reducing children’s exposure to SHS is currently underway (Waters et al 2002). However, in this protocol the authors note that some studies indicate that programmes which include practical advice, suggestions, and follow up may significantly reduce smoking and effect positive behavioural change among family and carers.

New Zealand evidence: There is New Zealand evidence that children’s exposure to SHS is related to the number of smokers in the home setting (based on nicotine levels in hair) (Al-Delaimy et al 2000). Mass media messages have dealt with SHS exposure (eg, as part of the “Its about Whanau” campaign) and educational materials have addressed SHS exposure in the home. However, there have not been particularly intensive interventions and no evaluation studies appear to have been published.

There is however, New Zealand data that shows that levels of nicotine in hair and cotinine in urine are lower in children who live with caregivers who smoke outside the house than inside the house (Al-Delaimy et al 2002). This finding would suggest that there is some probable health benefit for children who reside in homes with smokefree rules.

Comments: Despite the overall findings of the TFCPS review, a study identified in this review (one RCT of nurses undertaking home visits) was suggestive of some reduction in infant exposure to SHS.

In New Zealand there is evidence for fairly high acceptability of smokefree workplaces (see section 10.1). Therefore it is plausible that with appropriate public education, similarly high levels of public support could be achieved for the more widespread adoption of smokefree homes.

Any messages concerning SHS exposure in the home should possibly be primarily orientated to women as this group appear to be more likely to quit (based on Australian data (NSW Health 2001)).

Possible implications for New Zealand: That further consideration of interventions in this area by the health sector await the outcome of the current Cochrane systematic review.

11 Other public health interventions

11.1 Smokefree sponsorship

Background: Health sponsorship has been used to replace sponsorship by the tobacco industry in a number of countries – particularly Australia and New Zealand. 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”. The HSC replaced tobacco sponsorship with “smokefree” sponsorship in sporting and cultural events. Over the last decade the Council has increasingly become a “social marketing” agency primarily in the area of tobacco control, but also other areas of health. The HSC has developed various health brands three of which relate to tobacco control (ie, the “Smokefree”, “Auahi Kore” and “Lungfish” brands). Through these brands the HSC aims 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. In addition to health sponsorship, the HSC has also played a key role in smoking cessation (via the Quit Group). It has also run smoking cessation contests in New Zealand.

In addition to the HSC, public health units in DHBs and NGOs also contribute to various smokefree sponsorship activities. For example, action by Crown Public Health and the HSC have contributed to around 80 sports clubs adopting smokefree policies in the Canterbury region in recent years.

Evidence for effectiveness: No relevant systematic reviews were identified for health sponsorship in any area of public health. However, one systematic review was found in the social marketing area. It identified some value of social marketing as a component of interventions to modify health professional behaviour (ie, as part of educational outreach interventions (Thomson O’Brien et al 2000)).

In Western Australia a ban on tobacco sponsorship linked to tobacco replacement sponsorship involving health promotion has been reviewed (Holman et al 1997a). The reviewers found that the survey data indicated that such 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 found 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). Furthermore, these authors reported that “there was evidence of good compliance with smoke-free policies, thus reducing exposure to environmental tobacco smoke”.

Other Australian data has identified that spectators attending sports events were more likely to report smoking than non-participants (Holman et al 1997b). Similarly, such spectators had higher smoking rates than members of organised sports clubs and those

who attended arts events. Such data indicates that smokefree sponsorship can potentially reach organisations that involve relatively high proportions of smokers.

Economic evaluation: No studies relating to the cost per quitter or gains in terms of QALYs were identified. One Australian study did report cost savings from the use of health sponsorship kits at events rather than having sponsorship agency staff at events (Giles-Corti et al 2000).

New Zealand evidence: There are no evaluation data specifically on New Zealand's smokefree sponsorship activities that have been published in Medline-indexed journals. A brief 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 and Wilson 1997). Indeed, recent data certainly indicate that most New Zealanders now support the banning of tobacco sponsorship (60%) and tobacco advertising (70%) (de Zwart and Sellman 2002).

Some impact of smokefree sponsorships in assisting with the denormalisation of smoking is plausible given the decline in tobacco consumption in New Zealand during the 1990s. However, many other factors such as smokefree environments regulations and tax increases are likely to have played more important roles. Also, smokefree sponsorship did not appear to prevent the rise in youth smoking that occurred in the 1990s (Laugesen and Scragg 1999b) and yet youth have been a major audience for sponsorship activities. This could suggest that sponsorship plays a relatively small role relative to such factors as the price of tobacco, provision of pocket money and the portrayal of smoking in the media. This is perhaps not surprising given the difficulty that smokefree sponsorship has in competing with the likely impact of smoking by movie stars in popular movies.

Nevertheless, reports from the HSC to the Ministry of Health and other data provide some information on the benefits of sponsorship activities. Examples include:

- There has been relatively high public awareness of the smokefree brand according to survey data in 1997 (MDL 1997). At this time the smokefree brand ranked 11th in the country for sponsorship awareness (ie, behind two banks, a communications company, six alcohol brands and a soft drink brand). This brand was also ahead (in terms of public awareness for sponsorship) of all the tobacco brands, all oil industry brands and all food brands. Unprompted awareness of the smokefree brand remains high (at 93% in 1999 and 2001). Also there is evidence of increased awareness of the brand (as measured by a recent drop in unprompted awareness from 13% in 1999 to 4% in 2001)(Potter 2002)). The major source identified by respondents for hearing about the smokefree brand was "television", followed by "sports events", and then "newspapers/magazines".
- Qualitative research using focus groups and teacher interviews has been conducted in regard to the "Smokefree Stage Challenge" in 2001 (NFO CM Research 2001). This work suggests that the 2001 event was popular with students and related data appears favourable (ie, 11 000 participants, audience numbering around 20 000, and 3.5 hours of national television coverage). Furthermore, the event appeared to generate pressure (from teachers and peers) for students not smoke and even to quit.

- There has been significant television coverage of the “cokesmokefreerockquest” in 2001 (HSC 2001a).
- Feedback from around half of 97 netball centres indicates “that most are Smokefree” (HSC 2001b).
- A telephone survey of 30 of HSC’s stakeholders in 2001 provided “strongly positive feedback on its service and brands generally” (KMBC 2001). The feedback on the smokefree and Auahi Kore brands was also generally very positive. However, some respondents stated that there was a need to go beyond the branding and one-off events to smoking cessation support.

Over 100 sports clubs in New Zealand are reported to be smokefree and most major sporting stadiums now have either comprehensive or fairly comprehensive smokefree policies (Potter 2002). These changes may be partly the result of sponsorship links with the HSC and promotional activities by public health units. The HSC has also played a role in assisting a major car rental company establishing a smokefree vehicle fleet (HSC 2002a).

Furthermore, HSC sponsorship activities appear to have been successful in terms of engaging in activities where a Māori audience can be reached. Examples of recent activities include the following (HSC 2002b):

- Inclusion of netball as a smokefree sport (in which Māori women are major participants).
- Involvement in rugby league (which has a relatively high proportion of Māori participants).
- Involvement in softball (which has a relatively high proportion of Māori participants).
- Support for Māori touch rugby, Māori tennis, Māori golf and waka ama.
- Involvement with various Māori performing arts (eg, Kapa Haka 2002 – the National Aotearoa Traditional Māori Performing Arts Festival).
- Working with a group of traditional Māori tattoo practitioners.

Some marae are now auahi kore / smokefree which may reflect the promotional activities of local iwi, the HSC and public health unit workers. Interviews with health workers also indicate how the auahi kore message has been picked up in various Māori activities such as Iwi sports (MDL 1997). Between 1999 and 2001 survey data identified an increase in public awareness of the “Auahi Kore” brand from 36% to 47% (Potter 2002). This survey data also indicate that 54% of Māori respondents thought that marae should allow smoking only in “set areas” while a further 25% thought that marae should be entirely auahi kore. Also over three-quarters of these respondents wanted kohanga reo, kura kaupapa and schools in general to be totally auahi kore. These results probably reflect a positive shift from those attitudes held a decade ago.

Comments: It is very plausible that health sponsorship in the New Zealand setting has greatly assisted in the process of removing tobacco promotion through sponsorship. Tobacco industry sponsorship of sports and arts was substantial in the 1980s and since the SFE Act 1990 it has been phased out and is now completely absent. This contrasts with some other countries where tobacco sponsorship remains a major problem. For example during the period 1995-99 the tobacco industry sponsored at least 2700 events, programmes, and organisations in the United States (with the

minimum total funding amount of these sponsorships being \$365 million) (Rosenberg and Siegel 2001). The authors of this review considered that tobacco corporate sponsorship serves as an important marketing tool for the industry.

The Australian data also suggest that health sponsorship can increase the prevalence of smokefree policies in various settings as well as promote anti-smoking messages (particularly to groups that are hard to reach).

There appears to have been an expansion of smokefree environments and dissemination of the smokefree / auahi kore message in the New Zealand setting as a result of sponsorship and social marketing activities. However, there is still a lack of rigorous evaluation data from which to more precisely quantify the impact of these activities. This would suggest that there is a need for further evaluation work in this area (eg, more quantitative data on the extent to which sports clubs, sports venues and marae have become smokefree as a result of smokefree sponsorship activities). Nevertheless, consideration could also be given to moving some of the resources spent on sponsorship and social marketing to the smoking cessation area (eg, mass media campaigns and smoking cessation contests) – given the stronger evidence for effectiveness of such interventions.

Other ideas (from a public health perspective) on ways to potentially enhance the benefits of smokefree sponsorship and social marketing include the following:

- Making the linkages between smokefree sponsorship and requirements for smokefree clubs and venues stronger.
- Shifting more of the sponsorship spending towards the sports in which Māori women participate (eg, netball and softball). This is because of the particular importance of reducing smoking rates in this population (and to maximise the protection of their infants and children). Young women are probably more responsive to health messages than young men and appear to be more likely to quit for the sake of their children (see section 10.1).
- Focusing sponsorship of arts particularly on those areas that are directly relevant to Māori and particularly on those which involve physical activity (eg, kapa haka).
- Possibly avoiding sponsorship of sports that are not associated with life long physical activity and which have high injury rates (such as rugby and rugby league). Examples of sports having lower rates of serious injury than rugby include netball, softball, tennis and golf. The latter two sports are also particularly associated with life long physical activity (as opposed to activity focused only in teenage years and early twenties).

Possible implications for New Zealand:

- That the impact of health sponsorship / social marketing expenditure be further evaluated in the New Zealand setting.
- That consideration be given by the relevant agencies to shifting more of the spending on sponsorship to interventions that are proven to be effective (such as improving the funding for mass media campaigns that promote smoking cessation and smoking cessation contests).
- That consideration is given to shifting a greater proportion of sponsorship spending towards sports involving young Māori women (eg, netball and softball) and to arts events that involve Māori (eg, kapa haka performances).

11.2 Specific nutritional advice to smokers (supplementary intervention)

Background: Nutritional factors may play a role in adverse health outcomes among smokers – including the risk of various cancers and cardiovascular disease.

Evidence for effectiveness: In a review of lung cancer prevention, the Canadian Task Force on Preventive Health Care (TFPHC website) considered that there was “fair evidence” to advise smokers to eat an average of seven portions of green leafy vegetables or fruit per week [evidence grading = B, II-2]. However, no interventions relating to changing the dietary behaviour of smokers were identified in this review.

A review reported two cohort studies that showed decreased risk of prostate cancer with increased intake of vitamin E, particularly among smokers (Fairfield and Fletcher 2002). However, this review reported on two RCTs that found *increased risk* among male smokers receiving beta carotene. Three other trials reported no increase in risk but included fewer smokers.

There is some animal evidence that multiple antioxidants given as dietary supplements can help lessen the harmful effects of SHS (Zhang et al 2001). But the relevance of this finding for humans requires clarification.

New Zealand evidence: There are no published studies on nutritional interventions for smokers in New Zealand.

Comments: It is possible that this intervention may pose risks of providing reassurance to smokers to the extent that they delay actual quitting attempts (and quitting is the major way for smokers to reduce lung cancer risk). Indeed, this appears to be the experience with the availability of low tar / low nicotine cigarettes on the market (Warner et al 1997). This would suggest that the key message should probably continue to be that the best action that smokers can take for their health is to quit smoking and to keep making quit attempts. Nevertheless, from a harm minimisation perspective there is a case for helping smokers who will not or can't quit, to minimise their risk of cancer and cardiovascular disease.

Possible implications for New Zealand: That consideration is given to conducting research in this area (ie, on how New Zealand smokers would react to specific nutritional advice).

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