Report to
Apararangi Tautoko Auahi Kore
and the
Smokefree Coalition

The Impact on
Maori and Low-Income Families/ Whanau
of Tobacco Tax Increases:
A Brief Review

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Executive Summary

Aim

To review the international and New Zealand literature on the effects of increases in tobacco taxation, both beneficial and adverse, and particularly the effects on Maori and low-income families/whanau.

Methods

Literature searches were undertaken using Medline, Econlit and Index New Zealand. These were supplemented by searches for New Zealand unpublished literature, the examination of key texts and a hand search of journals.

Main findings

There are large potential health and welfare benefits from tobacco tax rises for Maori and low-income families/whanau, if smokers quit or reduce their smoking. Policy makers need to match tobacco tax increases with other interventions. These are to ensure that there is no increased hardship for families/whanau, where smokers do not reduce their smoking at least in proportion to the price increase.

Immediate impact on smokers: There is strong evidence internationally and from New Zealand data that increasing tobacco tax enhances quitting and reduces consumption among smokers. There is some international evidence to suggest that this impact is greatest for low-income smokers.

Youth uptake: There is reasonable evidence internationally that increasing tobacco tax reduces the uptake of smoking by young people. However, there are no New Zealand data on this issue.

Health impact on smokers and those around them: The dominant evidence is that most smokers are nicotine dependent, suffer severe health outcomes (half of long-term smokers die as a result of their smoking), and their smoking harms others (fetuses, children, and adult non-smokers). Taxation increases reduce this health impact for those that quit or reduce smoking. However, unless there are compensating measures by government to reduce the levels of deprivation for low-income smokers, there are suggestions that those with multiple indicators of deprivation may be less likely to quit than those with limited deprivation. This has particular implications for those groups most likely to be severely deprived, such as Maori and single parents (nearly all of whom are women).

Financial hardship: There is the risk of increased hardship where smokers do not quit or reduce sufficiently to compensate for the increased cost of tobacco. There will be financial benefits where smokers quit or reduce sufficiently. Work in Britain has suggested that where there are not compensating measures by government to reduce the deprivation of low-income smokers, tax increases are likely to increase hardship for some. However, the limited New Zealand data to date do not support this for the
aggregate group of lone parent families (due to compensatory reductions in tobacco use).

The average spending in 1996-7 on tobacco by lone parent smokers has been estimated at $17 per week (4% of the total spending of their household). A 30% tobacco price increase could have caused about a $5 per week increase in tobacco spending for those (relatively few) lone parent smokers who did not quit or reduce smoking. Lone parent families are used by us as a proxy to measure the impact of tobacco taxation for all deprived groups.

The potential for any resulting hardship may be avoided by nicotine dependent individuals regularly using nicotine replacement therapy (NRT), which is cheaper for the equivalent dosage than smoking a packet of 20 cigarettes a day.

Other potential adverse effects: Increases in tobacco tax may potentially alter usage rates of other drugs (alcohol, cannabis) but the data on such effects is limited. High tobacco taxes are related to increased tobacco smuggling internationally but this may be less likely to occur in New Zealand due to its isolation.

Methodological complexity: There are many methodological and conceptual issues that complicate any detailed considerations of the health, social and economic aspects of smoking and the use of tobacco taxation to control tobacco.

Policy options: To ensure that there is no increased hardship for families/whanau, where smokers do not reduce their smoking at least in proportion to the price increase, policy makers can consider the following immediate measures:

Enhancing motivation and the means to quit:
- Expanding mass media campaigns.
- Fully subsidising NRT for low-income groups and allowing NRT to be sold in supermarkets.
- Expanding Quitline services and part-subsidising smoking cessation counseling for low-income groups.

Reducing the social determinants of smoking and countering any financial impact:
- Enhancing benefit payments and other transfers (eg, housing help) for low-income groups.
- Reducing income tax for low-income groups.
- Making appropriate changes in other taxes (eg, GST and rates).

Longer-term measures, which will improve the ability to quit or reduce smoking, and thus reduce the possible financial and other hardship for low-income smokers include the:
- Increased regulation for smokefree environments.
- Full disclosure and control of cigarette constituents and combustion products.
- Further control of tobacco marketing (eg, plain packaging, restrictions on the point of sale).
The options to ensure that there are the long-term resources to put particular interventions into place include the use of dedicated tobacco taxes.

**The context for policy making:** This includes the likely societal benefits from tax-related reductions in smoking. Amongst those are the reduction of the adverse effect of smoking on workforce productivity, reducing a range of workplace costs (e.g., cleaning, ventilation), reducing the risk of fires and reducing the tobacco-related cost burden to the health sector.

**Conclusions**

There is insufficient evidence at present to quantify the potential adverse effects of financial hardship of increasing tobacco taxation on Maori and low-income New Zealand families. Any such burden appears unlikely to be large, relative to the substantial gains in health of smokers and their families when such tax increases cause even modest reductions in the amount smoked. Any possible welfare burden needs to be weighted against the strong evidence that increasing tobacco taxation discourages the uptake of smoking by young people, and thus decreases the future burden for Maori and low-income families.

For those Maori and low-income smokers who do not reduce consumption, there is a range of policy options for government to counter any hardship produced. There are also a number of policy options to increase the effectiveness of tax increases in reducing smoking prevalence and consumption.

*Increasing tobacco tax is probably the most powerful single tobacco control instrument available to policy makers. There is therefore a need to decrease the unwanted effects from tobacco tax increases, rather than limit the use of this option.*

**Recommendations to government**

1) **Research funding:** That government funds further research work on the impact of tobacco taxation which could use the full depth of a number of rich existing data sources (e.g., Household Economic Survey unit data, Census unit data). This work should include research surrounding any future significant tobacco taxation increases and the impact of this on Maori and low-income families/whanau.

2) **Increasing tobacco taxation:** That all government agencies work towards further increasing tobacco taxation in New Zealand (ideally one very large price increase every two years). These increases should be accompanied by interventions to minimise the potential financial hardship to some Maori and low-income families/whanau and to decrease the social determinants of smoking. These interventions include stronger mass media campaigns, continued free access to the Quitline, fully-subsidised nicotine replacement therapy for low-income smokers, and increased welfare benefits or reductions to the income tax burden for low-income groups.
3) **Plugging taxation loopholes:** That government acts to ban all tobacco sales from duty-free stores based in New Zealand.

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**Competing interests:** The authors are involved in tobacco control related work for other health sector agencies but these are not in the area of tobacco taxation.

1 **Introduction**

1.1 **The background**

*Smoking and poverty:* Smoking in New Zealand is concentrated in poorer families and amongst Maori and Pacific Islanders. There has been a clear income and deprivation gradient for smoking rates (higher in low-income groups) identified for some time in New Zealand (Pearce et al 1985\(^1\); Jackson et al 1990\(^2\); Kawachi et al 1991\(^3\); Pearce and Bethwaite 1997\(^4\); Whitlock et al 1997\(^5\); Ministry of Health 1999a\(^6\)). The latter Ministry publication (*Taking the Pulse*) indicated that in 1996-97 the most deprived quartile by NZDep96 score had 40% more current smokers than the next quartile (36.9% compared to 26%). The most deprived quartile had 138% more smokers than the least deprived quartile (36.9% compared to 15.5%).

The 1996 census data also indicated that the most deprived areas had the highest smoking rates (Wilson and Borman 1998\(^7\)) and that smoking rates are highest among those with no qualifications, those on low incomes and those who are unemployed (Borman et al 1999\(^8\)). Low-income groups also have higher exposure to secondhand smoke (Whitlock et al 1998\(^9\)).

*Ethnicity and smoking:* The impact of smoking on Maori health has been significantly greater than for non-Maori, with an estimated 31% of Maori deaths in 1989-93 being attributable to tobacco use (Laugesen and Clements 1998\(^10\); 5). Maori appear to be far more likely than Pakeha to not just be in households with smokers, but to be in low-income households with smokers (Crampton et al, in press\(^11\); Whitlock et al 1998\(^12\)).
Crampton et al report that for the same level of deprivation (as measured by NZDep96), significantly more Maori smoke than Pakeha. Tobacco control and the impact of tobacco taxation is thus a Treaty of Waitangi issue. Two particular principles of the Treaty (as defined by both the Waitangi Tribunal and the Court of Appeal) are involved.

These are:

- The exchange of the right to make laws for the obligation to protect Maori interests.
- The Maori interest should be actively protected by the Crown (Peterson and Verboeket 1988).  

**Tobacco taxation:** Tobacco taxation has been recognised internationally as being one of the most effective means of decreasing tobacco consumption and the consequent adverse health impact of its use (Chollat-Traqet 1996; Townsend 1996; Meier and Licari 1997). New Zealand work is similarly suggestive of such a benefit in reducing consumption (Laugesen and Meads 1991; Laugesen 1997) and there are also some limited data to suggest that some decisions to quit by Maori are related to high tobacco prices (Klemp et al 1998; Glover 1999).

Nevertheless, there is concern about the potential adverse impact on low-income smokers and their families when smokers do not quit or cut down in response to increases in tobacco taxation (eg, in the UK setting, Marsh 1997). Such a concern has also been articulated in New Zealand (eg, Treasury 1997) but so far little evidence has been presented by the parties involved in New Zealand upon which to inform evidence-based policy making in this area. As a result, Apararangi Tautoko Auahi Kore (ATAK) and the Smokefree Coalition requested a literature review on the topic of tobacco taxation and its impact on Maori and low-income families/whanau. This will be the first part of a larger project organised by Apararangi Tautoko Auahi Kore and the Smokefree Coalition that will include the analysis of relevant New Zealand economic data.

### 1.2 The objectives for this study

- To review the international and New Zealand literature on the beneficial and adverse effects of increases in tobacco taxation/tobacco prices, particularly those effects on people with low incomes.
- To review the international and New Zealand literature on the response of indigenous people and particular ethnic groups to tobacco tax increases/price increases and the subsequent effects.
- To give a brief discussion of the possible implications of the findings for policy development and for New Zealand-specific research.
1.3 Methodology for the literature review

**Medline:** Medline searches for the years 1966 to October 1999 were conducted, using combinations of the search words “tobacco / smoking” “price/income”, “ethnic”, “Maori”, “indigenous”, “gender”, “female”, “women”, “solo parent”, “Zealand” and “tax”.

**Econlit:** The electronic database for economic literature “Econlit” was searched with the same search terms.

**The Cochrane Library:** Searches of the *Cochrane Database of Systematic Reviews* (version 2, 1999) were conducted for relevant economic material.

**New Zealand literature:** In addition to Medline and Econlit referenced material, a search of Index New Zealand was undertaken, along with a searches of the literature held by key libraries (Ministry of Health and Wellington School of Medicine). Relevant grey literature was identified by an examination of *New Zealand Smokefree e-News*. Documents from Treasury and the Ministry of Health (based on Official Information Act requests) were also examined for relevant material.

**Other:** Key texts examined included the recent World Bank report on the economic aspects of tobacco (1999\(^23\)) and the texts by Marsh and McKay (1994\(^24\)) and Abedian et al (1998\(^25\)). Hand searches of the following journals were performed for the period following January 1990: *Tobacco Control, Journal of Health Economics* and *Health Economics*. Electronic searches of the web-site indexed versions of the various journals were undertaken using the words “tax” and “tobacco/smoking” (the *British Medical Journal*, the *New England Journal of Medicine* and the *Lancet*). Other material was identified by examining the references in review articles and other key articles obtained. However, the scope of the review was restricted by the budget available, and so limited effort was spent on investigating sources of relevant unpublished material in New Zealand.
2 The Framework for Considering the Evidence

2.1 Types of impact

The areas that were identified where there are potential major impacts for Maori and low-income families/whanau, as a result of increased tobacco taxation, included changes in consumption and prevalence, with the consequent changes in:

- **health** status;
- **family welfare** due to the financial impact (positive or negative depending on the extent of consumption and prevalence changes); and
- **long term social** effects on the family/whanau that stem from a lower uptake by children and youth, and the long term social effects of health changes.

Beyond the evidence of impact, we found that there were other relevant issues, which included information deficits and the theoretical frameworks for the impact calculations.

2.2 Information deficits

A discussion of the beneficial and adverse effects of tobacco tax increases requires information on the:

-Extent of the consumption and prevalence changes for different income, age, gender and ethnicity groups in response to price changes.
-Health and welfare impact and the subsequent costs of tobacco use for smokers, smokers’ families, non-smokers and the community.
-Extent to which smoking gives any benefit (however defined) to smokers. There appears to have been very little work in this area (Kabra 1998:77).

**Health information**

In 1995 Zimring and Nelson stated that the “magnitude of the harm done to non-smokers is not known with any degree of precision” with estimates on a key cost from second hand smoke varying by a factor of 20 (Zimring and Nelson 1995). The indications are that as the knowledge about the extent of the health costs from smoking continues to increase, the extent of present under-measurement of the negative externalities is further demonstrated. For instance the estimate of 6% of United States medical care spending being smoking related may be very significantly short of the reality (Warner 1998). The World Bank uses a range of 6-15% of medical costs being smoking caused in high-income countries (Jha and Chaloupka 1999).

In particular, information on the health impact from passive smoking is rapidly expanding (eg, Hankey 1999, You et al 1999, Bonita et al 1999) while there is a subsequent lag in the translation of the knowledge of these impacts into costs. Despite the growing information on health impact, little information is available on the costs of passive smoking to low-income and Maori non-smokers in New Zealand.

A further complication is that the use of epidemiological evidence on the relationship between tobacco consumption changes and health changes is made more difficult by
the length of time for some health changes to take effect (Moore 1995\textsuperscript{33}:6, Kabra 1998\textsuperscript{34}:78).

**Welfare costs**

There is a lack of research overseas and in New Zealand on the causation of social differences in smoking, and the welfare and social impact on low-income smokers and their families (Marsh and McKay, 1994\textsuperscript{35}:2). In New Zealand and elsewhere, part of the reason is the lack of survey material that has sufficient numbers within the affected groups to get reliable analysis (Marsh and McKay 1994:21).

### 2.3 Theoretical frameworks

Even where there is sufficient data for accurate calculations of impact, there is a considerable debate about the appropriate ways to make the calculations – the theoretical frameworks to use. For instance the calculations for the amount by which demand for tobacco varies with price (elasticity) vary with the methods used (Cohen and Henderson 1996\textsuperscript{36}). A consensus review of the economic approaches to tobacco taxation, by a range of economists, can be found in Warner et al (1995\textsuperscript{37}) and a variety of individual approaches are gathered in Abedian et al (1998\textsuperscript{38}). Some arguments for minimal tobacco taxes can be found in Albon (1999\textsuperscript{39}).

**Costing methods**

The calculation of the costs of tobacco use is particularly subject to controversy. For instance the use of the measures used for civil damage litigation, which include using monetary figures for pain and suffering (Zimring and Nelson 1995\textsuperscript{40}), would give different total costs from the approach used by the New Zealand Treasury, that emphasises only some medical expenses (Treasury 1997b\textsuperscript{41}).

The debate about defining and costing benefits and costs includes the question of what particular costs are accepted as ‘external’ costs. External costs are those affecting the community rather than just the smoking individual (Warner 1998\textsuperscript{42}). That concept exists within the theoretical economic framework that depends on the individual sovereign consumer, a framework that may have disadvantages for a discussion of tobacco costs and benefits (Kabra 1998\textsuperscript{43}). The use of that framework can be considered a value judgement (Buck et al 1999\textsuperscript{44}). Many of the issues within defining and costing the impact of tobacco are covered by the New Zealand authors Ashton and St John (1985\textsuperscript{45}) and Easton (1997\textsuperscript{46}). Authors writing elsewhere on tobacco use costs include Barnum (1994\textsuperscript{47}) for the World Bank and Collins and Lapsley (1996\textsuperscript{48}) for the Australian government.

In particular, the cost of life is debated – its inclusion for both passive smoking and active smoking victims and the amount of cost (Kabra 1998\textsuperscript{49}, Warner 1998\textsuperscript{50}). The environmental accounting concept of existence value (the value that we will pay to ensure the existence of something) may help economists in this area, especially for the value placed on smoker’s lives by the community – putting an external value on human life (Chaloupka 1998). The World Bank (Barnum 1994\textsuperscript{51}) includes the value of life when costing tobacco use.
Another part of the debate is about the extent to which the purported smaller spending on pensions for smokers and possibly shorter period of medical spending on smokers is outweighed by smoking costs (Hodgson 1992\textsuperscript{52}, Barendregt et al 1997\textsuperscript{53}, Kaiserman 1997\textsuperscript{54}).

The costs about which there is debate on their inclusion as external costs include:

- The loss of real output not borne by the smoker – for instance 50 million working days/yr in the United Kingdom (Townsend 1996\textsuperscript{55}),
- Sickness benefits,
- Dependant’s benefits,
- The effects of sickness on the wider family/whanau,
- The additional load on life and medical insurance by undetected and past smokers,
- The loss in tax revenue from lost life years,
- The cost of life-years lost by smokers to their families and the community and the way to calculate this (Markandya and Pearce\textsuperscript{56}, Chaloupka 1998\textsuperscript{57}).

There is a further dimension to the discussion about private or external costs. Collins and Lapsley (1998\textsuperscript{58}) argue that if smokers are not simultaneously fully informed, rational, and required to bear the total costs of their tobacco use, then any of the resultant costs are social costs, not private costs.

One theoretical approach calculates the personal ‘utility cost’ to smokers of a rise in tobacco prices, as the theoretical ‘consumer surplus’ is eroded (Cohen and Henderson\textsuperscript{59}). The ‘consumer surplus’ is the difference between the price of a pack of cigarettes, and the higher price that a smoker would be willing to pay if it was necessary to pay more to get the cigarettes. The theory suggests that this difference is a ‘benefit’ which the smoker enjoys, and which would be eroded by a price rise (Banwick et al\textsuperscript{60}). However, the theory requires rational consumers.

**The relevance of the costing arguments**

The point of detailing the information above is that any literature discussing the impacts of tobacco tax will be affected by the approach used. If some costs are excluded, the impact found will be different.

**Benefit concepts**

Some investigation has been done on the particular processes by which nicotine dependence influences demand for tobacco, both from the economist’s viewpoint with ‘rational addiction’ models (Becker and Murphy 1988\textsuperscript{61}, Chaloupka 1991\textsuperscript{62}, Douglas 1998\textsuperscript{63}, Suranovic et al 1999\textsuperscript{54}) and the psychologist’s (Parrott 1995\textsuperscript{b65}, 1998\textsuperscript{66}). However, there does not appear to have been any investigation of any particular differences in benefit for low-income people. Neither does there appear to have been any exploration by economists of the view of some psychologists that smoking may give little or no benefit for the smokers.

The ‘rational addiction’ economic models do not actually suggest that those who are nicotine dependent are rational, rather they are used to investigate how such
dependence affects the smokers view of the costs of smoking and quitting (Warner 1998^{67}).

**The theories of smoking and deprivation**

There are debates about the causes of higher smoking uptake and/or lower quit rates for poorer people. The higher rate of smoking by parents, siblings and older peers will affect the uptake of smoking by the children of poor families. However, Graham (1998^{68}) argues that the educational and job expectations of youth are more important. So young people from poorer families who succeed in school, or who have better job prospects, are less likely to take up smoking.

The relevance for the impact of tobacco taxes lies in the possible need for measures to complement tax rises which will address the causes of differential smoking uptake. The debate is part of the wider one between those who see smoking as an individual matter, with policies targeted at the individual, and those who see smoking uptake and non-quitting as part of social disadvantage for families and whole strata of people.

While the correlation between inequality, deprivation and lower smoking quit rates by adults has been shown in detail by a number of authors (Marsh and McKay 1994^{69}, Graham 1994^{70}, Graham and Der 1999^{71}), the possible causal mechanisms appeared to have been discussed largely by psychologists. The explanations include:

- That smokers are already stressed by nicotine dependence, and that increased stress means that the nicotine dependence is even more difficult to cope with, and so increased smoking may occur (Cohen and Liechtenstein 1990^{75}, Pomerleau 1990^{76}, Parrott 1995a^{77}). The obverse to this is that in the long run, quitting smoking reduces stress.

Both arguments support the idea that social interventions to reduce involuntary stress for deprived smokers (housing, income, and creche facilities) can make quitting easier.
3  The Evidence on Changes in Prevalence and Consumption

3.1  International evidence – tobacco tax/prices and low-income groups

3.1.1  Context

The effect of tobacco tax increases may be different for low-income groups when there are different contexts. The context variables may include the price of other products, the level and impact of health education (Leu 1984\textsuperscript{78}, Glantz 1993\textsuperscript{79}, Meier and Licari 1997\textsuperscript{80}, MMWR 1996\textsuperscript{81}, Hu 1995\textsuperscript{82}) and the degree of social inequality (Marsh 1997\textsuperscript{83}, Kennedy et al 1996\textsuperscript{84}). For instance if the price of nicotine replacement products is low enough, they are a cheaper alternative than tobacco.

3.1.2  Effects

A number of articles report significant prevalence and consumption effects for people in low-income households from tobacco tax increases, in Massachusetts (Biener 1998),\textsuperscript{85} all regions in the United States (Farrelly and Bray 1998a\textsuperscript{86} 1998b\textsuperscript{87}; Meier and Licari 1997\textsuperscript{88}) and in the United Kingdom (Townsend et al. 1994\textsuperscript{89}; Townsend 1996\textsuperscript{90}). In these studies, low-income smokers were much more likely to quit and/or decrease consumption than others. However, one British study reported little difference for low-income smokers (Borren and Sutton 1992\textsuperscript{91}).

Within the discussion on the effects of price change on low-income people is the question of the regressive or progressive effect – do tobacco tax rises adversely or positively affect poor smokers more than rich smokers? Warner et al (1995\textsuperscript{92}) suggest a possibly progressive effect from such increases where the price elasticity for low-income people is high. This effect occurs when low-income smokers cut their spending on tobacco more than the amount by which their previous spending would have risen with the increase.

The World Bank, when reviewing the effects of tobacco tax rises, indicated that this progressive effect has been found in studies in high income countries, but further research is needed (Jha and Chaloupka 1999\textsuperscript{93}). Some of the evidence for a possible regressive effect in Britain, for those with very high and multiple levels of deprivation, is shown in Marsh and McKay (1994\textsuperscript{94}). This highly deprived group (smokers and non-smokers) appears to be a small percentage of the population (and composed largely of women). The implications are touched on in section five below.

The effects for youth

In the Massachusetts study (Biener 1998), youth from low-income families were more likely than youth from richer families to cut tobacco consumption, but not to quit. If teenagers in general are seen as a low-income group, then the evidence is significant that some groups (such as British teenage girls) are very sensitive to price (Townsend et al 1994\textsuperscript{95}).
Two earlier United States studies showed that those smokers under 17 and those 20-25 were markedly more likely to reduce consumption, compared to those over 35 years (Grossman 198996). A later study (Grossman and Chaloupka 199797) showed that significant increases in quitting by youth from tax increases, and that such changes may affect decisions to start regular smoking (they found that a 10% increase in price resulted in a 7% decrease in teenage smoking prevalence). Another US study again showed a significant price impact on smoking prevalence by 13-16 year olds, with boys markedly more sensitive to price than girls (Lewit et al 199798).

A review of a number of studies indicated that for both quitting and consumption reduction, tax increases have been shown to affect youth two to three times as much as adults (Warner 199899). Indeed, a group of economists convened in 1995 by the United States Office on Smoking and Health concluded that the value in discouraging children from becoming addicted to nicotine was potentially the most powerful argument for increased tobacco taxation (Warner et al 1995100).

### 3.1.3 Compensating behaviour

While the quantity purchased may decline, smokers may compensate by choosing cigarettes higher in nicotine, by inhaling deeper, or by inhaling more often (and letting less of the tobacco burn without inhalation). Thus the health effect may not be directly related to the quantity purchased. In jurisdictions where tobacco is taxed by such variables as cigarette or pack units, smokers can react to price increases by a move to longer or bigger cigarettes.

One of principal publications on compensating smoking (Evans and Farrelly 1998101) suggests that compensating behaviour largely reduced the health benefits of tax increases, especially for young adults aged 18-24 years. However, the relevance of this United States research for New Zealand may be affected by the tobacco taxation system differences between the countries.

### 3.2 International evidence – tobacco tax/prices and indigenous or ethnic groups

The literature search identified very little relevant material in this area. The only specific study of tax effects for a largely indigenous community is Chapman and Richardson’s study of New Guinea (1990102). This found significantly larger changes for price changes compared to higher-income countries. Some of the policy implications for lower-income regions and countries are discussed by Warner (1990103).

Farrelly and Bray (1998a104 1998b105) report that Hispanic and Black (non-Hispanic) smokers in the United States were more likely than others to reduce or quit smoking after cigarette price increases, after controlling for income and education. Blacks were more likely than Hispanics to quit rather than reduce smoking. Chaloupka and Liccardo Pacula (1999106) report that young black men in the United States are significantly more responsive to changes in price, compared to whites. A survey of
Hispanics in New Mexico suggested that income was a significant variable for continued smoking, with those on low incomes having a higher rate (Samet et al. 1992). A San Francisco study by Perez-Stable et al (1998) suggests that Latino smokers were more likely to quit than other groups for a range of family-related reasons. Quitting due to the price effect of tobacco tax rises might also be family related for some ethnic groups.

3.3 New Zealand evidence – prevalence and consumption changes

3.3.1 Context

The context for the effects of tobacco tax changes in New Zealand includes the amounts spent by low-income households on other areas such as housing and food, and the costs of nicotine replacement products.

Some of the evidence on context effects is shown in section 5.1 below.

3.3.2 Prevalence and consumption elasticity and low-income groups in New Zealand

The background of studies of the New Zealand general population

Salter (1981) analysed the situation in New Zealand from 1961 to 1979, during a period when the real price of cigarettes fell by over 30%. She found that estimated quarterly short-run price elasticity was -0.21, annual price elasticity was -0.15 and annual real income elasticity was 0.37. The annual price elasticity meant that the general effect for the whole population of smokers of a tobacco price rise or fall of 10%, was a fall or rise in consumption of 1.5% (controlling for other factors such as advertising). So despite health education, as real income went up, and the real price of cigarettes fell, the demand for cigarettes rose.

Laugesen and Meads (1991) investigated price in relation to other factors affecting demand for tobacco, using weekly sales data in 1988 and 1989. Significant long-run effects on demand from price were found. James (1995) reviewed nine New Zealand studies of tobacco demand from Salter (1981) to three reports in 1991. He found a range of long run price elasticities reported for the general population of smokers, from -0.41 to -0.52.

The effect for low-income groups

Morrison Cooper (1989) reported that tobacco taxation in New Zealand was regressive. This Tobacco Institute publication did not report on the effect of tax increases.

Laugesen (1997), using lone parents as an example of a low-income group, found that tax increases during 1984-8 were not regressive for this group as a whole. As a
group they decreased their consumption at a rate sufficient to counter the price increases, and to ensure that they did not pay a greater percentage of their income on tobacco. He calculated that a 40% tobacco price increase meant 12% of smoking lone parents quit, 26% reduced consumption, and 62% continued to smoke at the same rate.

This study appears to have been the only one on the prevalence and consumption effects of tobacco tax increases on different New Zealand socio-economic groups.

3.3.3 The prevalence and consumption effects for Maori

We have found only two studies which give any indication of the prevalence and consumption effects of tobacco tax rises for Maori. Klemp et al (1998\textsuperscript{114}) found some indications that price was a stronger factor for giving up for Maori than health education. However, the small sample size for this study means that this finding is fairly tentative. The evidence from Holdaway (1999\textsuperscript{115}) is discussed in section 5.1. Some indication was found from this small non-random survey that price rises might prompt some low-income Maori smokers to quit.
4 The Evidence for Health Benefits

4.1 Introduction

A general discussion on the health impact of tobacco taxes is covered in Moore (1995\textsuperscript{116}). His finding for the United States is that:

“tobacco tax increases in the previous year cause a significant decrease in the mortality rates.”

Using US data for 1954-1988, his calculations show a 1% decrease in lung cancer, cardiovascular disease and asthma mortality for a 10% increase in tobacco tax. Some of the range of the health impact of tobacco use is detailed by Bartecchi et al (1994\textsuperscript{117}).

Research on identifying tobacco-related health impacts (Doll 1998\textsuperscript{118}) would suggest that reductions in tobacco consumption should reduce the occurrence of the approximately 40 medical conditions. While the decline in ischaemic heart disease and stroke tends to occur relatively rapidly, other conditions such as lung cancer may not decline for decades after a decline in smoking.

Some of the detail of some smoking-related illness amongst Maori is described by Bullen and Beaglehole (1997\textsuperscript{119}). The particular benefits from tax increases, for households with pregnant women and/or children, are stressed by Aligne and Stoddard (1997\textsuperscript{120}) and Adams and Young (1999\textsuperscript{121}). Much of these avoided costs are in the short term, so even when policy makers decide to heavily discount future benefits, the advantages of protecting mothers and children from tobacco smoke remain.

4.2 International evidence – tax rises & the health of low-income & ethnic groups

4.2.1 The context for the health impact

The general relationship between poverty and smoking is described by Smeeth and Fowler (1998\textsuperscript{122}), writing about the British situation:

“Smoking increases socio-economic health inequalities in two ways. Higher rates of smoking among those with the lowest incomes mean that the burden of disease due to smoking is highest in these groups. In 1991 adults in three-quarters of the families receiving income support smoked, and one seventh of their disposable income was spent on cigarettes. By exacerbating the poverty of those on the lowest incomes, the health effects of smoking go way beyond the direct effects of tobacco fumes.”

In the situation before a tax rise, the health effects of smoking go beyond the direct effects of tobacco smoke, by exacerbating the poverty of those smokers on the lowest incomes and the households in which they live (Lynch et al 1997\textsuperscript{123}).
4.2.2 The health impact

Because they are more likely to quit with price rises; poorer smokers appear to gain greater health benefits from tobacco tax rises compared to richer smokers, who generally gain more from health education (Warner et al 1995\(^{124}\), Townsend 1996\(^{125}\)).

Warner (1987\(^{126}\)) argues that the higher prevalence of smoking by and related health impact on blacks in the United States means that they would benefit more from a tobacco-free situation than whites. There is a lower use of nicotine patches among African Americans and Hispanics in the United States, at only one third of the rates in whites (Pierce et al 1995\(^{127}\)). This may be another reason favouring the role of tobacco tax, as part of the health policy package to address smoking in this population.

4.3 New Zealand evidence

The literature search identified no New Zealand-specific literature that directly related tobacco taxation to population health benefits in the way that Moore (1995) has done for the United States, as mentioned above in section 4.1. The evidence of the changes in New Zealand tobacco use related to tax rises, as shown in section 3.3.2 above, can be used to calculate health gains. A principal example is Laugesen and Clement’s study on smoking mortality amongst Maori (1998\(^{128}\)).

Other work does suggest that during the decline in tobacco consumption over the last 15 years there have been ongoing reductions in tobacco-related diseases including ischaemic heart disease (IHD) and stroke (MoH 1997\(^{129}\), PHC 1994\(^{130}\)). Sudden infant death syndrome (SIDS) has also declined in recent years and tobacco exposure is an important risk factor in the New Zealand setting (Mitchell et al 1997\(^{131}\)). Declines in IHD and stroke have also occurred among Maori. These favourable disease trends may be partly due to reduced tobacco-exposure (due to interventions that include taxation) but other factors such as dietary change (for IHD) and changes in sleeping position (SIDS) are probably also important.

4.4 Summary of health benefits

A summary of some of the major potential health benefits from a tobacco tax rise that reduced consumption significantly include:

- Reduced incidence of health problems among infants whose mothers smoked during pregnancy (e.g., low-birth-weight, birth complications, perinatal death, behavioural problems in childhood).
- Reduced incidence of diseases in children that are associated with exposure to second hand smoke (glue ear, respiratory infections, SIDS, asthma).
- Reduced incidence of diseases among smokers themselves (particularly ischaemic heart disease, stroke, chronic respiratory disease and lung cancer).
- Probable mental and physical health benefits to families/whanau due to lower financial strain (where smokers quit, or reduce consumption at a greater rate than the tax increase effect).
5 The potential welfare impact on families/whanau

Some studies from Britain suggest that tobacco taxation may contribute to the poverty experienced by smokers who do not quit (Marsh and McKay 1994, Dorsett and Marsh 1998). Spenser (1996) reported that for Australia in 1993-94, 16% of weekly income was spent on tobacco by the lowest quintile (by income) of households with smokers. She found that such households spent 280% more on alcohol than non-smoking households did, and “considerably less on clothing and medical” services. Lone parent households with smokers spent the same proportion of household income on tobacco (4-5%) as other types of households with smokers.

The New Zealand evidence is very limited, but the data on lone mothers in the 1980s (Laugesen 1997) has suggested that this group decreased their consumption as a group at a rate sufficient to counter the price increases.

5.1 The context of household spending

The possible financial hardship from increasing tobacco taxation can be crudely considered by examining the cost of smoking as part of total household spending.

The proportion of spending – New Zealand data from 1985

Ashton and St John (1985) discussed the relative effects of tobacco taxation in New Zealand for income groups. They used the (then) Department of Statistics Household Survey of Expenditure Patterns to estimate the expenditure by different income groups and family types.

They found that for the third to bottom decile (by disposable income) of families with two adults and three children, over 4.5% of aggregate household disposable income went on tobacco (ie, for all households). This compared with less than 1.5% for the top two disposable income quintiles. For household with one adult and one or more children, the aggregate proportion of household spending on tobacco went from 1.7% for the second lowest income decile to 2.6% for the fourth lowest decile.

As only some households had smokers, those households would have spent a greater proportion of disposable income on tobacco than the average (probably around three times given that about a third of the adults in those groups smoked).

New Zealand data from 1994

Laugesen (1998) found that the average (all non-smoking and smokers) household spending on tobacco in 1994 was 1.6% of the total spending, while households with smokers spent an average 6.7% of total spending. For lone parents the average household spending on tobacco was also 1.6%, and he estimated that for households with smokers the spending on tobacco was 4%. That compared with 20% spent on food (assuming lone parent smokers spent the same amount on food as non-smokers).
The Palmerston North survey
A 1994 small non-random survey of low-income people in the Palmerston North area indicated that a third of the Maori smokers used over 20 cigarettes a day. This was estimated to cost 14% of an income of $250 a week. While 57% of the Maori smokers said they had attempted to quit at some stage, only 16% said that this had been due to the cost alone. Over a third of the Maori smokers said that “smoking was their only luxury” (Holdaway 1999).138

The Ministry of Health 1996-97 health survey
Data from this survey has been used to create the table below. There is some indication from these data that Maori are smoking less than Pakeha – but this is not at a statistically significant level. Of note however, is that those with no qualifications were significantly less likely to be light smokers than those with higher education.

Table 1 Reported number of cigarettes smoked among smokers by socio-demographic variables (percentages adjusted for cluster sampling) (based on Ministry of Health 1999a)139

<table>
<thead>
<tr>
<th>Key socio-demographic variable</th>
<th>1-10 cigs per day (%)</th>
<th>11-20 cigs per day (%)</th>
<th>21+ cigs per day (%)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maori</td>
<td>47.3</td>
<td>40.8</td>
<td>11.8</td>
<td>Maori smokers appear to have a lower tobacco consumption than Pakeha (but not at a statistically significant level)</td>
</tr>
<tr>
<td>European/ Pakeha</td>
<td>40.3</td>
<td>46.0</td>
<td>13.7</td>
<td></td>
</tr>
<tr>
<td><strong>NZDep96</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (least deprived)</td>
<td>48.5</td>
<td>41.1</td>
<td>10.4</td>
<td>No statistically significant differences.</td>
</tr>
<tr>
<td>2</td>
<td>38.0</td>
<td>45.5</td>
<td>16.5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>43.1</td>
<td>45.1</td>
<td>11.8</td>
<td></td>
</tr>
<tr>
<td>4 (most deprived)</td>
<td>45.5</td>
<td>42.0</td>
<td>12.6</td>
<td></td>
</tr>
<tr>
<td><strong>Family income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-$20,000</td>
<td>44.8</td>
<td>41.8</td>
<td>13.4</td>
<td>No statistically significant differences.</td>
</tr>
<tr>
<td>$20,001-$30,000</td>
<td>40.3</td>
<td>45.2</td>
<td>14.5</td>
<td></td>
</tr>
<tr>
<td>$30,001-$50,000</td>
<td>49.0</td>
<td>40.1</td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>$50,001 +</td>
<td>42.5</td>
<td>44.4</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No qualifications</td>
<td>38.2</td>
<td>45.9</td>
<td>15.9</td>
<td>Those with no qualifications were significantly less likely to be a light smoker (1-10 / day) than those with the highest level of qualifications.</td>
</tr>
<tr>
<td>School or post school only</td>
<td>39.8</td>
<td>47.7</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>School &amp; post school only</td>
<td>52.7</td>
<td>38.1</td>
<td>9.2</td>
<td></td>
</tr>
</tbody>
</table>

5.2 Comparing tobacco and other spending
Data from the 1996-97 Household Economic Survey (Statistics New Zealand 1997)140 are detailed in the tables below. To get the approximate spending by particular groups, we have combined aggregate data and the percentage of households reporting
particular spending. So for instance while the average weekly spending on tobacco by lone parents was $6.70, the average spending by *smoking* lone parents was approximately $13. Lone parent families are used here by us as a proxy to measure the impact of tobacco taxation for all deprived groups.

We stress that this is an approximation, to begin to give some context to the impact of tobacco tax rises. It should be noted that the percentage of households given for each decile or group is generally rounded to the nearest 10% due to the small sample for most of the groups, and that there is some under-reporting of tobacco and other spending, where these items are reported at all. To compensate for at least some of the under-reporting of tobacco spending, we have added 20% to the reported amounts.

### 5.2.1 Comparisons between spending areas

Two questions have been asked for each type of household:

1. What is the comparable effect of a small (5%) increase in housing costs compared to increases in tobacco prices, where households are not able to cut down on either of the costs? So a 5% ($7) increase in average housing costs for a household type might be more than a 30% ($5) increase in average tobacco costs for a household with smokers.

2. What is the equivalent part of the food budget to the extra amount spent due to a 30% increase in tobacco prices, where the amount of tobacco used is not reduced? For instance the average extra amount spent on tobacco by a household with smokers who do not reduce might be $5, equal to 10% of the average food budget for a type of household.

These estimates are to try and see the effect of tax rises on food available for children, in the worst case of no reduction of smoking by adults. However, as the extra money needed for tobacco will usually be taken from a range of discretionary spending areas (transport, apparel, alcohol, household operation, leisure) and the range will not necessarily include food, any such worst case effect is will nearly always be much smaller or absent.

### Table 2 - Average weekly expenditure by household income decile, year to March 1997

(Statistics New Zealand 1997 with 20% added to reported tobacco spending)

<table>
<thead>
<tr>
<th>Spending area</th>
<th>Under $13,100</th>
<th>$13,100 to $18,499</th>
<th>$53,900 to $68,199</th>
<th>Expenditure - all income groups ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobacco products</td>
<td>5.8</td>
<td>5.9</td>
<td>13.1</td>
<td>9.5</td>
</tr>
<tr>
<td>Alcohol</td>
<td>9.0</td>
<td>4.8</td>
<td>22.1</td>
<td>15.2</td>
</tr>
<tr>
<td>Housing</td>
<td>129.6</td>
<td>130.6</td>
<td>94.0</td>
<td>95</td>
</tr>
</tbody>
</table>
Comparison of possible spending increases on tobacco to housing and food costs

- Generally the cost of housing only needs to move by 5% ($6.55) to create a larger effect for low-income households with smokers than a 30% ($6) rise of tobacco prices, for households who were not able to cut down on those costs.
- A 30% rise in tobacco prices for average low-income households who were not able to cut down tobacco spending, would have been approximately $6, or about 11% of the spending on food by the second lowest income decile.

**Table 3 - Average weekly expenditure by ethnic group of householder, year to March 1997** (Statistics New Zealand 1997 with 20% added to reported tobacco spending)
Notes:
* The sample sizes are so small that these figures are only indicative.
† Includes all other ethnic groups eg, Asian people.
‡ See explanatory footnotes to Table 2.

Comparison of possible spending increases on tobacco to housing and food costs

- Generally the cost of housing only needs to move by 5% ($6.60) to create a larger effect for Maori households with smokers than a 20% ($5.40) rise of tobacco prices, for households who were not able to cut down on those costs.
- A 30% rise in tobacco prices would, for average Maori households with smokers who were not able to cut down, have caused a spending rise of approximately $8, or about 9% of the spending on food by the Maori households.

Table 4 - Average weekly expenditure by household type, year to March 1997
(Statistics New Zealand 1997143 with 20% added to reported tobacco spending)

<table>
<thead>
<tr>
<th>Spending area</th>
<th>1 adult, 1 or more children</th>
<th>All types</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average spending ($)</td>
<td>% *</td>
</tr>
<tr>
<td>Tobacco products</td>
<td>8.0 50 17</td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>3.0 17 18</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>161.1 160</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>70.4 70 150</td>
<td></td>
</tr>
<tr>
<td>Health services</td>
<td>4.2 33 13</td>
<td></td>
</tr>
<tr>
<td>Total net expenditure</td>
<td>446.7 100 446</td>
<td></td>
</tr>
</tbody>
</table>

Note:
* See explanatory footnotes to Table 2.

Comparison of possible spending increases on tobacco to housing and food costs

- Generally the cost of housing only needs to move by 5% ($8) to create a larger effect for households with lone parent smokers than a 45% ($7.65) rise of tobacco prices, for those who were not able to cut down on those costs.
- A 30% rise in tobacco prices would on average, for lone parents who were not able to cut down, have been approximately $5, or about 7% of the spending on food by the lone parent households.

5.2.2 Using the data from the tables

Users of these data need to be aware of the approximations involved. They need also to be aware that the data masks both the worst cases and possible ameliorating effects.
While the tables above show some consequences for some groups, they are not able to reveal the effect of tobacco tax rises on the worst case situations – usually young low-income heavy-smoking lone parents, with no qualifications, in rental property, who are not able to give up or reduce smoking.

However, it is the nature of any spending changes which result from tobacco tax rises, that will determine the impact on poverty. Reduced expenditure on healthy food, education, housing and health services might all have adverse health impacts and intensify the poverty trap. Reduced expenditure on alcohol may have health benefits, and some spending reductions may be neutral.

5.2.3 Summary – Comparison of tobacco and other spending

For low-income groups, Maori and lone parent households:
- Generally the cost of housing only needs to move by 5% to create a larger effect for households with smokers than a 20% rise of tobacco prices, for households who were not able to cut down on those costs. Maori households appear to have the most vulnerable ratio of housing and tobacco spending. Low-income and lone parent households required a 30% and 45% rise in tobacco prices to approximate the effect of a 5% housing cost rise.
- A 30% rise in tobacco prices for households, who were not able to cut down tobacco spending, would have been, at most, about equal to 11% of the spending on food. Low-income households appeared have the most vulnerable ratio of food and tobacco spending.

5.3 Welfare impacts for Maori and low-income families/whanau

Insofar as tobacco tax increases may cause more quitting for low-income groups than other groups, low-income groups may gain significant welfare benefits. There are potential social implications of decreased mortality from major tobacco-related diseases such as IHD. These include the increased social cohesiveness where older people survive for part or all of their grandchildren’s childhood. This may have special relevance for Maori, who at present lose a much larger proportion of their kaumatua to premature death compared to Pakeha. Beyond the role of elders in any society, kaumatua have a crucial role in sustaining Maori culture and Te Reo Maori.

Other unquantified potential benefits of reducing smoking prevalence for low-income people are the reduced risks of lost income associated with illness and time off work to care for children with ETS-related illnesses (asthma, respiratory infections, glue ear etc). Becoming smokefree for some individuals may also have benefits in terms of self-esteem and confidence – which may assist young people in obtaining and retaining paid employment. For Maori, the auahi kore / smokefree identity may be part of developing a stronger identity with Maori culture (in which traditionally no mood-altering drugs were used). However, such potential benefits are only supported by anecdotal evidence and require further research to clarify their importance.
5.4 The welfare implications of the use of nicotine replacement therapy

The availability of nicotine replacement therapy (NRT) potentially allows smokers who continue to be dependent on nicotine to avoid the potential financial impact of tobacco taxation increases. This is because routine use of nicotine gum or transdermal nicotine patches obtained from a pharmacy are substantially cheaper than smoking a packet of 20 cigarettes per day. While there is a higher up-front cost to NRT (at a minimum of around $20 for a pack of gum and $30 for a pack of transdermal nicotine patches) some smokers can manage this by sharing packs of NRT.

The cost to the consumer per day for the use of gum ranges from $4.80 to $6.45; patches from $4.20 to $5.50; nasal spray from $3.20 to $4.55; and inhaler around $8 per day. These prices compare to $3.15 to $7.90 for 10 to 20 cigarettes per day. The median cost of a nicotine patch ($4.80 per day) is approximately equivalent to the cost of smoking 15 cigarettes per day (National Health Committee 1999144).

Other welfare benefits of using NRT flow from the way that it increases rates of quitting (based on four extensive reviews: Silagy et al 1994145; Fiore et al 1994146; Tang et al 1994147; Silagy et al 1997148). Therefore the use of NRT should reduce the costs of health problems that are associated with tobacco use in the short-term (eg, asthma exacerbations and respiratory infections). Similarly, NRT provides the weight loss benefits that some smokers see as a benefit from smoking. Nevertheless, many smokers are unlikely to find NRT a suitable substitute given that it does not fulfil certain perceived “advantages” of smoking (eg, immediate relief of withdrawal symptoms, and “looking cool / sexy”) and has potential disadvantages (eg, risks of minor side effects such as rash).

5.5 Potential impact on the use of alcohol and other substances

Some smokers may respond to a tobacco tax increase by switching to other drugs such as alcohol. There are no data on this issue for New Zealand but limited international data does suggest interactions between the usage rates and prices of various drugs:

- Research in Spain suggests that increasing the taxation of alcohol reduces tobacco consumption (Jimenez and Labeaga 1994149).
- Some US work suggests that cannabis use and frequent drinking are substitute activities (Yamada et al 1996150; Chaloupka and Laixuthai 1994151).

This tentative international work may not be relevant to New Zealand. Nevertheless, given that home-manufactured beer and spirits are not subject to tax in this country, it is possible that the use of these products may increase if tobacco and alcohol taxes continue to increase. This should be a potential concern given that alcohol misuse has significant adverse health and welfare impacts for New Zealand as a whole and low-income groups and Maori in particular (MoH 1999152).
We found no published data on interactions between cannabis usage and tobacco prices, though such interactions are plausible given some data on interactions between alcohol and cannabis usage (as detailed above). Nevertheless, any substantial increase in the consumption of cannabis associated with high alcohol and tobacco prices may be of concern for the health of low-income groups who may be disproportionately high consumers of cannabis.

Interactions between tobacco prices and consumption levels of other drugs (opiates, amphetamines, ecstasy etc) are also plausible – but no data are available. This is also the case for caffeine (in the forms of coffee, tea and some soft drinks) which is the most commonly used mood altering substance in New Zealand. Nevertheless, there is some literature on the interactions between caffeine and nicotine dependency (eg, Hepple and Robson 1996\textsuperscript{153}).

### 5.6 Criminalisation associated with smuggling

The international literature suggests that high tobacco taxes is associated with tobacco smuggling (eg, in Europe – Joossens and Raw 1998\textsuperscript{154}). Tobacco smuggling is related to the degree of corruption in a country (World Bank 1999\textsuperscript{155}) and it may support gangs and other criminal activities such as money laundering. In New Zealand, all tobacco farming has ceased and no evidence was found that tobacco is smuggled into New Zealand on a commercial scale. Indeed, such smuggling is probably unlikely since the geographical isolation of New Zealand and its relatively vigilant Customs service makes smuggling of large volumes of tobacco very expensive and risky.

As tobacco taxation may increase among all developing and developed nations (as recommended by the World Bank in the same document) it is plausible that the financial rewards for inter-country smuggling may even decline in the future. The World Bank also notes that there are a range of anti smuggling measures (improved pack labelling and use of serial numbers, licensing of the relevant distribution agencies, increasing penalties, increasing surveillance and computerised tracking systems). The Bank suggests that as experience grows with these measures, “the prospects for better controls in all affected countries are likely to improve”.

The purchase of tobacco products over the Internet and the postage of these to New Zealand might become a more common way to evade high tobacco taxes if these are increased. However, such mail can be detected by Customs officials using dogs trained to smell drugs. The legal loophole of duty-free tobacco is more of an advantage to high-income smokers who are more likely to travel internationally than other smokers. Indeed, the presence of the duty-free supply has a potential to be increasingly important as the tobacco tax is raised.
6 The context for policy-making involving tobacco tax rises

6.1 The impact for the wider society

It is possible to identify the range of likely benefits for the wider community that would result from tobacco tax caused reductions in smoking prevalence and tobacco consumption levels. The present costs from tobacco for the wider community, in so far as they slow real economic growth, restrict the options for government in changing policy. This restriction may impact on Maori and low-income families/whanau.

Benefits to the workforce: Benefits would arise from reducing the adverse effect of smoking on workforce productivity since:

- Smokers in middle age and in the workforce are more likely to die than non-smokers. The cost of the reduced labour force from smoking in New Zealand has been estimated at $400 million in 1990 (Easton 1997156).
- Smokers have higher absenteeism rates (due to tobacco-related illness in themselves and their children) (Batenburg and Reinken 1990157). One estimate for the lost productivity in New Zealand from smoking-related morbidity is $90 million in 1990 (Easton 1997).
- The productivity of smokers is generally impaired due to the need for regular smoking breaks and due to higher illness rates among those still attending work (eg, respiratory infections). One estimate based on New Zealand data suggests a cost of $45 million per year (Easton 1997). There is also some evidence that nicotine impairs people’s ability to carry out complex manual tasks with precision (Contreras-Vidal J. Reported in: New Scientist 1999: (27 November): 25).
- The productivity of non-smokers exposed to secondhand smoke can be impaired due to nuisance effects or adverse health effects (increased risk of asthma attacks and respiratory infections).

Reduced smoking in workplaces (ie, those not covered by the smokefree environments legislation) would also have potential benefits to business in terms of reducing the following:

- cleaning costs,
- computer malfunction costs (computers are damaged by ETS),
- fire insurance costs,
- costs associated with extra levels of ventilation,
- wastage of personnel time spent in resolving disputes between smokers and non-smokers.

These workforce productivity and lower cost benefits are likely to benefit employers and the wider economy, but they may also flow on to low-income employees in some situations (eg, by providing more jobs).

Reduced risk of fires: Reductions in smoking would reduce the risk of house fires and forest fires that cause property damage and also threaten life. In New Zealand the cost of tobacco-related fires is estimated to cost around $15 million a year (Easton 1997). This particular benefit is likely to be relevant to Maori and low-income
families/whanau without smoke alarms whose homes and lives are at increased risk from smoking-related fires.

**Reduced cost burden on the health sector:** Reduced smoking would tend to reduce lifetime medical expenditures – at least according to some US data (Hodgson 1992\textsuperscript{158}).

Another estimate for the cost of smoking to the New Zealand Public Health Service was of $185 million in 1989 (Phillips et al 1992\textsuperscript{159}). However, this study did not consider the health sector costs avoided among smokers associated with dying at much younger ages than non-smokers.

The World Bank estimate that 6-15\% of medical costs are smoking related in higher-income countries (Jha and Chaloupka 1999\textsuperscript{160}). Using this range, New Zealand may have spent $480-$1200 million of the 1997-8 total health spending ($7994 million) on such costs (Ministry of Health 1999b\textsuperscript{161}).

**Reduced societal cost of tobacco usage:** Reduced smoking would tend to reduce the total cost of tobacco usage to society. This may be a considerable benefit given that one New Zealand study puts the overall social cost of smoking in New Zealand at 3.2\% of total human capital and 1.7\% of GDP (Easton 1997). The costs of smoking in this study (using a value of a human life at two million dollars) totaled $22.5 billion for the 1990 year (relative to a scenario of no smoking) with tangible costs being $1.2 billion. While there is some debate over what monetary value such analyses should put on human life, this analysis used the most officially recognised value in New Zealand at present ie, the one based on work by the Land Transport Safety Authority (Miller and Guria 1991\textsuperscript{162}). Some economists may argue over other methodological aspects of this work by Easton, but it does give some indication of the huge scale of the adverse impact of tobacco use in New Zealand.

### 6.2 The fiscal context for government and the community

The total identifiable amount spent by government on tobacco control has been less than $13 million annually (Laugesen 1999\textsuperscript{163}, Ministry of Health 1998\textsuperscript{164}). This compares to the annual government revenue from tobacco sales of around $800-850 million during 1997-98 (Treasury 1997b\textsuperscript{165}), and the estimated tangible costs in 1990 of tobacco use in New Zealand, of $1220 million (Easton 1997\textsuperscript{166}).

### 6.3 Summary of the advantages and disadvantages for the wider society

This section summarises the main advantages and disadvantages of further increases in tobacco taxation in the New Zealand policy-making setting:

**Advantages of increased tobacco tax:**
- Reduced probability of the uptake of smoking by young people.
- Reduced smoking prevalence and level of smoking (reduced harm to smokers).
- Reduced harm to non-smokers from passive smoking (fetuses, children, and non-smoking adults).
• Probable cost savings to society from reducing the adverse economic impact of smoking (especially for the health sector and industry).
• Increased government revenue which is potentially available to promote health and support quitting and which can be used to off-set economic hardship among low-income groups.

The potential disadvantages of increased tobacco tax:
• The possible increased risk of economic hardship in the households of smokers who don’t quit or cut down in proportion to price rises (with potential adverse effects on health and welfare).
7 Discussion of the health and welfare impacts

7.1 Principal findings

**Immediate impact on smokers:** There is strong evidence internationally and from New Zealand data that increasing tobacco tax enhances quitting and reduces consumption among smokers. There is some international evidence to suggest that this impact is greatest for low-income smokers.

**Youth uptake:** There is reasonable evidence internationally that increasing tobacco tax reduces the uptake of smoking by young people. However, there are no New Zealand data on this issue.

**Health impact on smokers and those around them:** The dominant evidence is that most smokers are nicotine dependent, suffer severe health outcomes (half of long-term smokers die as a result of their smoking), and their smoking harms others (fetuses, children, and adult non-smokers). Taxation increases reduce this health impact for those that quit or reduce smoking. However, unless there are compensating measures by government to reduce the levels of deprivation for low-income smokers, there are suggestions that those with multiple indicators of deprivation may be less likely to quit than those with limited deprivation. The groups most likely to be severely deprived include Maori and single parents (nearly all of whom are women).

**Financial hardship:** There is the risk of increased hardship where smokers do not quit or reduce sufficiently to compensate for the increased cost of tobacco. However, such hardship may decline where smokers quit or reduce sufficiently. Work in Britain has suggested that where there are not compensating measures by government to reduce the deprivation for low-income smokers, tobacco tax increases are likely to increase hardship. However, the limited New Zealand data to date do not support this for the aggregate group of lone parent families (due to compensatory reductions in tobacco use).

The average spending in 1996-7 on tobacco by lone parent smokers has been estimated (see section 5.2) at $17 per week (4% of the total spending of their household). A 30% tobacco price increase could have caused about a $5 per week increase in tobacco spending for those who did not quit or reduce smoking. The potential for any resulting hardship may be avoided by nicotine dependent individuals regularly using nicotine replacement therapy (NRT), which is cheaper for the equivalent dosage than smoking a packet of 20 cigarettes a day. Policy options for government to avoid any such hardship for the households of non-reducing smokers are discussed below.

**Other potential adverse effects:** Increases in tobacco tax may potentially alter usage rates of other drugs (alcohol, cannabis) but there are no good data on such effects. High tobacco taxes are related to increased tobacco smuggling internationally but this may be less likely to occur in New Zealand due to its isolation.
**Methodological complexity:** There are many methodological and conceptual issues that complicate any detailed considerations of the health, social and economic aspects of smoking and the use of tobacco taxation to control tobacco.

### 7.2 Strengths and weaknesses of the state of evidence

The international evidence concerning the potential benefits of tobacco taxation is generally strong. Similarly the overall New Zealand evidence concerning the impact of increased tobacco taxation on reduced consumption is strong. However, from a New Zealand perspective there are major areas of uncertainty:

- The impact of increases in tobacco taxation on smoking rates among young people, low-income groups, Maori and women.
- The impact of increases in tobacco taxation on financial hardship experienced by low-income groups and Maori.
- The impact of increases in tobacco taxation on usage rates of other drugs (particularly alcohol and cannabis).
8 The implications for public policy

8.1.1 Policy options

There is a range of options to complement tobacco tax increases, which include:

Enhancing motivation and means to quit: Strategies include enhancing existing services (the promotion of the free Quitline) and boosting the current low-budget smoking cessation mass communications campaign (the “Quit Campaign”).

Fully subsidising nicotine replacement therapy for low-income groups: This action would further reduce the cost gap between smoking and using NRT (eg, for Community Services Cardholders). A more detailed discussion paper of this approach is currently being prepared for the Health Funding Authority by one of these authors (Wilson 1999167).

Allowing NRT to be sold in supermarkets: This action would probably further reduce the price of NRT (patches and gum) relative to the current pharmacy-only status. Such an approach appears to have proved successful in the USA (Oster et al 1996168; CDC 1997169; Shiffman et al 1997170; Lawrence et al 1998171; Shiffman et al 1998172).

Part-subsidising smoking cessation counseling for low-income groups: A voucher system could allow smokers to purchase an effective amount of counseling from the smoking cessation counseling provider of their choice (eg, GP/nurse counseling, Noho Marae programmes, hypnotherapy, group programmes etc).

Enhancing benefit payments and/or reducing income tax for low-income groups: These approaches are relatively blunt policy instruments but they could potentially off-set some of the potential adverse impact of increased tobacco tax. It would also help reduce the underlying social determinants of smoking (Marsh and McKay 1994173, Dorsett and Marsh 1998174, Graham 1994175 and 1998176, Graham and Der 1999177). The approach is also desirable on other public health grounds (such as reducing income inequality in society) and would help with achieving other government social objectives (eg, gender equality, strengthening families and enhancing social cohesion).

The converse of all the considerable evidence that shows how multiple disadvantages decreases the ability to stay smokefree is that:

“It is impressive how small a rise in the quality of material life is associated with a sharply lowered incidence of smoking” (Marsh and McKay 1994178: 83).

Those who argue that the raising of the incomes of the poorest and most disadvantaged will encourage smokers, or not affect their smoking, need to address the evidence arising from cuts in the real incomes of the poorest. In Great Britain (Marsh and McKay 1994179 chapter 3) it appears that such income cuts eventually increase the prevalence of smoking amongst the poorest, or at least slow the reduction
compared the reduction by other groups. The higher prevalence amongst poor smokers appears (once the effect of smoking parents is removed) largely related to their relative lack of quitting as adults (Graham 1998180).

**Changes in other taxes or social interventions:** Other taxes have impacts on low-income groups, including GST and rates. Changes to these taxes could be used to offset the potential financial hardship associated with increases in tobacco taxation and to achieve parallel social objectives. Housing creche and educational interventions could further modify the impact of tobacco tax rises, while also reducing the social determinants of smoking.

### 8.1.2 Linking tobacco tax increases with other policy developments

**New Zealand evidence**

The principal details we found of Treasury advice to the New Zealand Government on dedicated tobacco taxes showed that this agency argued that these taxes:

> “restrict the Government’s ability to adjust fiscal policy as required or ensure that competing claims for resources are assessed on an equal basis” (Spenser 1991181).

The Sullivan review of 1988 (New Zealand Customs Department 1988182) and the Public Health Commission in 1995 (PHC 1995183) both suggested that tobacco control funding could be directly raised from tobacco taxation.

The Ministry of Health has recommended:

> “a linkage, by way of a communications strategy, of an increase in excise and additional spending on new smoking reduction initiatives. …. The development of a communications strategy is recommended to present the excise increase as part of the Government’s commitment to reducing tobacco consumption.” (Ministry of Health 1997184).

There appears to have been no published in-depth New Zealand research on the dedicated use of tobacco taxation.

**International evidence - Direct health sector funding from tobacco tax:** This occurs in at least five countries including seven US states and three Australian states (PHC 1995185). The experience of the United States is that tobacco tax funded initiatives can contribute to significant improvements in tobacco control and reductions in smoking prevalence (Hu 1998186). The British government has announced it intention to:

> “divert to the national health service any additional revenue raised from future real increases in tobacco tax” (Finch 1999187).

**Linking with interventions for Maori and other ethnic groups:** Elder (1996188) records the use of the California dedicated tobacco tax to enable tobacco control
activities to reach diverse ethnic groups. As over 22% of all New Zealand smokers, Maori smokers contribute at least $200 million a year to general revenue. We found only one published mention of the policy implications of tobacco taxation for Maori (Reid and Pouwhare 1991). Evidence on the Treaty implications of Crown health policy has been given in the Napier hospital case before the Waitangi Tribunal in 1999–2000, but the transcript was not available by the time this report was produced.

A proportion of tobacco taxation revenue derived from Maori smokers could be dedicated to a Maori-controlled tobacco control agency. This would achieve Treaty of Waitangi objectives for tino-rangatiratanga, as well as helping attack the large disparity of smoking-related health and welfare consequences for Maori.

Other specific dedicated proportions of tobacco tax: These include options for youth and the poor or deprived. A proportion of the tobacco taxation revenue derived from illegal sales to youth (under 18 years) could be dedicated specifically to tobacco control targeted at youth.

The proportion of tobacco taxation revenue derived from the lowest quartile by deprivation could be dedicated to helping those smokers quit. Of this quartile, 36.9% smokes (Ministry of Health 1999a) and as they smoke at similar levels to the general population (Table 1) they would contribute at least $300 million a year through tobacco-related taxation (excise and GST). Bloomfield (1999) has estimated that the 40% with the lowest income are paying over $500 million a year in tobacco-related taxes.

Dedicated taxes for use beyond a narrow definition of the health sector: To prevent hardship to those members of low-income groups who continue to smoke at the same level, it has been proposed for Britain (eg, Townsend 1996) that increases in tobacco tax could be linked with other financial changes (eg, lowering income tax for low-income groups or increasing payments to beneficiaries).

Discussion: Without the legislative tying of tobacco related revenue to tobacco control, any ‘linked’ funding of initiatives are unlikely to be appropriate in size. By ‘appropriate’ we mean where funding is in a meaningful relationship to the costs of tobacco use. Without a legislative base, linked funds are also very vulnerable to erosion.

While there are periods in New Zealand (eg, 1986-91) and elsewhere where large gains in tobacco control have been achieved without dedicated taxes, the notable tobacco control success of such places as California, Massachusetts (CDC 1996) and the Australian State of Victoria argues for the adoption of this method. This approach is also being introduced in the UK (Beecham 1999).

Should a dedicated tax be considered, the experience in New Zealand (Thomson and Wilson 1997) and elsewhere is that politically defensible institutional structures need to be used to protect the continued success of the tobacco control work (Novotny and Siegel 1996, Pierce-Lavin and Geller 1998, Aguinaga Bialous and Glantz 1999).
The Treasury argument on dedicated taxes appears to ignore the ethical implications of revenue from an addictive substance, where the starting consumer is not fully informed. There appears to be ethical considerations to address in the use of tobacco-related taxation for other purposes than helping those dependant on nicotine to quit, helping prevent young people becoming dependant and protecting non-smokers.

James (1995\textsuperscript{199}) covers some of the basic discussion within the current New Zealand policy framework on the equity aspects of tobacco taxation. We found no published New Zealand investigation of the wider ethical framework relevant to this area. However, Graham (1998\textsuperscript{200}) comments on aspects of the Australian relationship between tobacco control and ethics. Also, Lewit (1989\textsuperscript{201}) has discussed the possible inequities from regressive tobacco taxes.

8.1.3 Summary of the policy options

To reduce the potential for increases in tobacco taxation to worsen financial and other hardship for low-income smokers, policy makers can consider the following immediate measures:

- Enhancing motivation and the means to quit:
  - Expanding mass media campaigns.
  - Fully subsidising NRT for low-income groups and allowing NRT to be sold in supermarkets.
  - Expanding Quitline services and part-subsidising smoking cessation counseling for low-income groups.
- Reducing the social determinants of smoking and countering any financial impact:
  - Enhancing benefit payments and other transfers (eg, housing help) for low-income groups.
  - Reducing income tax for low-income groups.
  - Making appropriate changes in other taxes (eg, GST and rates).

Longer-term measures that would improve the ability to quit or reduce smoking, and thus reduce the possible financial and other hardship for low-income smokers include:

- Increased regulation for smokefree environments.
- The full disclosure and control of cigarette constituents and combustion products.
- The further control of tobacco marketing (eg, plain packaging, restrictions on the point of sale).

To ensure that there are the long-term resources to put particular interventions into place, the options include the introduction of dedicated tobacco taxes. There appears to be ethical considerations to address in the use of tobacco-related taxation for other purposes than helping those dependant on nicotine to quit, helping prevent young people becoming dependant and protecting non-smokers.
8.2 The implications for future research

The major shortfalls found in information on the New Zealand impacts from tobacco tax rises are the:

- Amounts by which young people, low-income groups, Maori and women change their spending, and the variation between quitting, reduction and maintained consumption within those groups.
- The welfare impacts (positive and negative) due to increases or decreases in the household budget available for other items, the decrease in uptake by youth, and due to the health consequences of quitting and reducing consumption.
- The policy implications of tobacco taxation for Maori and low-income families/whanau. In particular, there appears to be a need for research on ways to ensure secure funding proportionate to costs of tobacco use for those groups, and on the Treaty of Waitangi implications of tobacco taxation.

Such work should ideally consider all sources of tax burden and put tobacco taxation in context with the impact of income tax, GST, and alcohol taxation.

Research into the impact of increases in tobacco taxation on usage rates of other drugs (particularly alcohol and cannabis) is also desirable. However, such research may be fairly difficult while cannabis is an illegal substance and has a highly distorted market price.

Agencies that have a role in supporting and funding such research work include the Health Research Council, the Ministry of Health, the Health Funding Authority, the Health Sponsorship Council, Customs and the Treasury. There appears to be a pressing need for a central plan and coordination of tobacco-related research within government agencies.
9 Recommendations to government

1. **Research funding:** That government funds further research work on the impact of tobacco taxation which could use the full depth of a number of rich existing data sources (eg, Household Economic Survey unit data, Census unit data). This work should include research surrounding any future significant tobacco taxation increases and the impact of this on Maori and low-income families/whanau.

2. **Increasing tobacco taxation:** That all government agencies work towards further increasing tobacco taxation in New Zealand (ideally one very large price increase every two years). These increases should be accompanied by interventions to minimise the potential financial hardship to some Maori and low-income families/whanau and to decrease the social determinants of smoking. These interventions include stronger mass media campaigns, continued free access to the Quitline, fully-subsidised nicotine replacement therapy for low-income smokers, and increased welfare benefits or reductions to the income tax burden for low-income groups.

3. **Plugging taxation loopholes:** That government acts to ban all tobacco sales from duty-free stores based in New Zealand.
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